FEDERAL TRADE COMMISSION

THE EVOLVING IP MARKETPLACE

THE OPERATION OF IP MARKETS

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8:30 a.m.

Co-hosted by the Federal Trade Commission and
the Berkeley Center for Law & Technology,
and the Berkeley Competition Policy Center

The Haas School of Business, Cheit Hall
University of California, Berkeley
2220 Piedmont Avenue, Wells Fargo Room
Berkeley, California 94720

FEDERAL TRADE COMMISSION

I N D E X

PANEL 1: THE IP MARKETPLACE IN THE LIFE SCIENCES INDUSTRIES

MODERATORS:

SUZANNE MICHEL, FTC

ERIKA MEYERS, FTC

PANELISTS:

EARL (EB) BRIGHT, General Counsel and Vice President, Intellectual Property, ExploraMed

DIANNA L. DeVORE, Partner, Virtual Law Partners LLP

REBECCA S. EISENBERG, Robert and Barbara Luciano Professor of Law, University of Michigan Law School

CAROL MIMURA, Assistant Vice Chancellor for Intellectual Property & Industry Research Alliances (IPIRA), University of California, Berkeley

SUZANNE M. SHEMA, Senior Vice President and General Counsel, ZymoGenetics, Inc.

STUART L. WATT, Associate General Counsel and Chief Patent Counsel, Amgen, Inc.

P R O C E E D I N G S

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MR. BARR: Good morning. This is the Federal Trade Commission's Hearing on the Evolving IP Marketplace. I'm Robert Barr, Executive Director of the Berkeley Center for Law and Technology. And, on behalf of BCLT and the Competition Policy Center at the Haas School of Business, we're proud to host these hearings.

So I'd like to introduce Suzanne Michel, and we'll get started.

MS. MICHEL: Thank you, Robert.

Welcome to the FTC's final installment of our hearings on the Evolving IP Marketplace. We have taken the show on the road. And we could not have done that without the excellent help of BCLT and Robert Barr and Louise Lee, so we thank them very much.

Our goal today is to examine how markets for intellectual property and technology operate, how they promote innovation, and whether any patent policies could be adjusted to encourage that goal of promoting innovation.

We have a great panel here of experts in the

biotech industry. A little later today we'll be examining those same questions in the context of another key industry in our economy, the IT sector.

So I'll turn it over to Erika.

MS. MEYERS: Hi. My name is Erika Meyers and I'm an attorney with the Federal Trade Commission's Office of Policy and Coordination. And I would also like to welcome you to the May installment of the FTC's Hearings on the Evolving IP Marketplace.

It's really great to be out here on the West Coast. And I would also like to thank the Berkeley Center for Law and Technology and the Berkeley Center for Competition Policy for hosting this portion of our hearings and for making it possible for us to hear a broader range of perspectives as we continue to explore the market for intellectual property.

I also want to remind everyone that we are accepting comments and you can submit those through our website until May 15th. We'd love to hear from everyone.

So we'll get started with our first roundtable discussion this morning. In this panel we're going to explore the operation of IP and technology markets in the life sciences industry. We'll look at the reasons companies

buy, sell, and license patents. We'll address some of the difficulties companies face in assessing the patent landscape and the effects of recent court decisions; as well as how patents support innovation and tech transfer.

I will follow our tradition of just giving name, rank, and serial number introductions for our panelists so that we can have more time to talk. In alphabetical order we have:

Eb Bright, who is General Counsel and Vice President for Intellectual Property at ExploraMed;

Dianna DeVore, who is a partner with Virtual Law Partners;

Becky Eisenberg, who is the Robert and Barbara Luciano Professor of Law at the University of Michigan Law School;

Carol Mimura, who is the Assistant Vice Chancellor for Intellectual Property and Industrial Research Alliances at the University of California, Berkeley;

Suzanne Shema, who is the Senior Vice President and General Counsel for ZymoGenetics;

And finally, Stuart Watt, who is Associate General Counsel and Chief Patent Counsel for Amgen.

So thank you all for coming. We look forward to a

great discussion.

MS. MICHEL: All right. Thank you.

MR. KLEY: Will there be a question-and-answer period?

MS. MICHEL: No, but we're happy to speak with you later, and the FTC is accepting comments on the website.

I'd like to start by asking each panelist to just give a brief introduction to your company or your client base and why patents are important to you. You know, why were you willing to come here early on a morning and speak with us?

Eb.

MR. BRIGHT: Okay. So ExploraMed is a medical device incubator and essentially what we do is we start start-ups. And currently we have four that have been started and are in different phases of their life cycle.

When we begin to look at the possibility of starting a new company, we hire-in what we call a project architect, who is generally a person with a fair amount of experience as an engineer in bringing medical device technologies to market. And we sit down and we look at areas that we think are not being met for patients or maybe are being under served for patients. And we begin to do a

little bit of analysis, a deep dive, and then looking into possible brainstorming ideas, and then ultimately analyzing the IP landscape.

If we do find an area that we think is an interest to us, looking into the IP landscape and whether or not there is freedom to operate or other people have already begun to explore that area is very important to us.

Oftentimes what we find is that there are usually a fair amount of research that's been done into the underlying mechanism of action of a particular disease state, but oftentimes there's been no connection of a solution of using that understanding that has been studied and researched. And we think that that's a prime opportunity for us to apply a solution where the mechanism of action is known.

MS. MICHEL: Thank you.

And we'll go around the table, but then maybe come to Becky last because as a professor she is very adept at giving the big picture and pulling it all together.

Dianna.

MS. DeVORE: Sure. Excuse me. So my name is Dianna DeVore. I'm actually a partner at a fairly new law firm called Virtual Law Partners. And I am the head of the

Patent Practice and I'm actually the founder of the patent practice within the firm. That said, I've been with the firm since February.

Prior to that I had been in-house for ten years and I have quite a varied background in-house. I have worked in a company that was a subsidiary of a large pharmaceutical company that had 65,000 employees around the world. And I've been part of a two-person start-up company that had the joy of trying to actually raise Series A funds back in last September and October, which was not the most successful thing.

At this point I have clients across the board. I have clients that are research institutes. I have clients that are public biotechnology companies. I also do some work for venture capitalists. I do some due diligence work. So I've now been on both sides of the start-up end, from the funders and from the people who are trying to raise the money, so.

MS. MICHEL: Carol.

DR. MIMURA: I manage the Office of Intellectual Property and Industry Research Alliances, or IPIRA, at U.C. Berkeley. And IPIRA consists of the traditional out-licensing office, the Office of Technology Licensing, which

obtains IP rights and licenses those rights to companies for commercial development. And then the sibling division, the Industry Alliances Office, brings in research into Berkeley from the private sector, from companies.

And this restructure happened about five years ago. It was deliberately restructured to give better service to the faculty at Berkeley, many of whom have a real need for research funding. In an era of declining federal funds, it became more and more important to have increased federal and foundation funding to support basic research at Berkeley.

And we have seen some demonstrable results under this program, but under this program, interestingly, the role of patent licensing then becomes slightly less important. IP rights licensing to the private sector is just one of the activities in IPIRA, and revenue generation is not the goal of that program, but a maximization of the societal impact of research from Berkeley is our goal. So it's not unimportant, but it becomes less important than under a structure where IP licensing is the be-all and end-all of the office.

We also have a particular rights management strategy in IPIRA called the Socially-Responsible Licensing

Program in which we license specifically to benefit the developing world, low- and middle-income countries worldwide.

MS. MICHEL: Thank you.

Stuart.

MR. WATT: Thank you for holding this hearing here in California. It's probably fitting that you do have a biotech panel in California; this industry was basically born in this state, out of the research labs of its universities and venture capital start-ups here in California.

In these hearings today as well as the prior hearings that you've held on patent reform, you've heard a lot of voices and views about the need for change in our patent system. And, while we understand the views of the other industries, we have a different view. The U.S. patent system has served the biotech industry very well over its 30-year time as an industry. And it's provided the necessary incentives for companies, for venture capitalists, for all the players to invest the dollars necessary to develop our products.

Amgen was started in 1980 as a venture capital start-up and is the largest biotech company in the world.

We have over 16,000 employees worldwide, over 8,000 employees in California. And last year we spent over $3 billion on research and development.

As you know, biotechnology is a high-risk, high-cost industry. On average our products take 12 to 15 years to develop from the early-stage research to the market. The average cost of that development is over $1.2 billion. One out of a hundred products make it to the market. And of those that make it to the market only about a third generate sufficient profits to cover their development costs.

So in that kind of environment where you have this high-risk, high-cost gain going on, it's vitally important that we have the means to protect our products, and patents are the primary way to do that. Without an effective patent system, our business model basically falls apart. And so we rely on the ability to obtain meaningful patent protection and the ability to enforce those patents, if necessary, to protect our products.

Hearing these other voices you might ask the question, why is biotechnology important in this debate? After all, some of these other industries, the IT industry for example, they employ more people. They generate more revenue, more dollars. They have a bigger voice, perhaps.

They make all kinds of gadgets that we rely on to do our work, to communicate with one another, to educate ourselves and to entertain ourselves.

But I think I can answer the question why biotechnology is important in this discussion very simply: Your lives will depend on it. At some point in your life or the life of a family member, you will need one of the products that biotechnology has produced to save your life. You'll consider it a miracle drug.

In the United States millions of patients have been served by Amgen's products and they depend on our products to preserve their health. In the era of healthcare reform, trying to save dollars, help drive down healthcare costs, biotechnology is uniquely positioned to answer some of the most critical challenges, the most costly and devastating diseases that we face as a society, be it cancer, heart disease, Alzheimer's, autoimmune diseases, bone diseases. The list goes on and on. And biotechnology has the promise to produce the products that will offer cures for those diseases.

And we ought to be investing in biotechnology. We ought to ensure that we have sufficient incentive for that investment and we ought to protect that investment through

continuing to maintain a viable patent system.

As we look at the current patent reform debate, as we -- you know, particularly the House bill that's being discussed last week and ongoing, we have concerns about some of the provisions there. Some of the provisions regarding post-grant opposition, venue changes, interlocutory appeals, damages, and so forth. We're very encouraged by the discussion in the Senate and the effort in the Senate to move to a central position on damages. And we give appreciation to Senator Feinstein and her staff for the time and effort that they put into that issue.

In the end, the patent system will determine whether we as an industry survive. We need to think carefully about trying to fix something that is not greatly broken. And we need to make sure that any changes we make to the patent system benefit all users of the system and allow it to continue to serve its constitutional mandate of incentivizing innovation.

Thank you.

MS. MICHEL: Thank you.

Suzanne.

MS. SHEMA: Good morning. Is this on?

(Sound not projected into the room:) I'd like to

thank the Federal Trade Commission for having these hearings and for inviting me.

AUDIO TECHNICIAN: Oh, excuse me. It just went off. I think you flipped on the switch on there. On the top there, the switch.

MS. SHEMA: Now is it on?

AUDIO TECHNICIAN: Try that one.

MS. SHEMA: How about this one?

AUDIO TECHNICIAN: There you go.

MS. SHEMA: Okay. Start again.

I'd like to thank the Federal Trade Commission for having these hearings and for inviting me. You're asking a lot of good questions. And the scope of your outreach has been impressive. And, including this panel, it's interesting to get the full lifespan of a biotech company.

ZymoGenetics is a public company that discovers, develops, and commercializes therapeutic proteins. We're no longer a start-up and we're not yet as successful as Amgen, but we're trying.

In many ways our story is typical for biotech companies. ZymoGenetics was founded by university professors based on research that came out of universities. And we were funded by investors who believe in patents.

Over 28 years, our researchers have done a lot of great discovery and early-stage R & D work. ZymoGenetics is atypical for many biotechs in that it's actually taken a product from the bench to the market and it sells a product. We launched our first product, RECOTHROM, last year.

In most cases, though, we seek to partner with a larger company to do late-stage clinical trials and sales. It's hard to overstate the importance of patents to ZymoGenetics. The patents were the magnets for our start-up money. They were the focus of our initial public offering and private financings before that. And patents have been our trade -- our bargaining chips over many years for licensing deals, including a potentially billion-dollar deal that we announced earlier this year for a new interferon molecule that ZymoGenetics' scientists discovered.

Simply put, ZymoGenetics and its products would not exist but for patents and but for confidence in a strong U.S. patent system. I echo Stuart's comments: The patent system works. It has its problems, yes, but those problems can be solved. And we welcome the opportunity to participate in that problem-solving process.

MS. MICHEL: Thank you.

Becky.

MS. EISENBERG: I'm Becky Eisenberg. I'm a professor at the University of Michigan Law School. Unlike the other panelists, I'm not directly involved in the biopharmaceutical industry or in representing clients. I have been an academic observer and I have been sometimes an advisor, generally an unpaid advisor, to National Institutes of Health, National Academies of Science, various public sector organizations who are interested in the regulation of innovation, interested in the patent system.

I have been writing about intellectual property issues for the biopharmaceutical side for 25 years now. I've seen things shift. It's been quite interesting. In my own interests, at an earlier point I was focused very much on sort of early-stage, upstream research and development, and I've been getting more interested in what's happening downstream, looking at drug development and looking even further downstream to the point of generic entry and what happens when these patents are actually litigated. And, from that perspective, sometimes finding that the patent system doesn't seem to be doing as much work as people might have assumed it's doing for them and kind of trying to put all that together.

So I'm here to listen really as much as to talk.

And I'm very eager to hear the perspective of other people who live with the patent system in a way that I don't, to get a sense of why it is that they prize their patents so highly. Exactly how it is that those patents help them.

MS. MICHEL: Great. That's great.

Let's start in the beginning, the early-stage research. What are some of the sources for you, your clients and companies, of the earliest stages of the ideas that might eventually become a product? We heard 12, sometimes 14 years down the road. And what's the role of the patent system in encouraging, promoting that very early stage of work?

And I'll ask the panelists if they'd like to turn up their table tents, and we'll go around the table and have a good discussion, I hope.

Carol.

DR. MIMURA: Certainly in our case --

MR. KLEY: Don't you think you should ask some inventors about that?

DR. KARMARKAR: How many inventors --

MR. KLEY: Should be a few inventors on the panel.

MS. MICHEL: Sir, this is an FTC hearing and not a public conference. We're creating a transcript for the

purpose of the Federal Trade Commission to prepare a report. I appreciate your input and we would be happy to take comments. I'd be happy to talk with you. I've talked with other people in this room, on the phone, and very much appreciated their insights and input, so I would be happy to do that. I'll give you my card following this. Thank you.

Carol.

MR. KLEY: Companies don't invent things, inventors do.

MS. MICHEL: Carol.

DR. MIMURA: Certainly from the university perspective, basic research comes primarily from public funding, from federal and state grants, increasingly from foundation grants. And I mention that one of the roles of our office is to bring in corporate funding from the private sector.

Often after one or two decades of basic research, a company will realize that a particular laboratory is getting slightly closer to commercialization or slightly closer to having something that could be relevant in the marketplace. At that point they're often interested in learning more. And they can engage in a sponsored-research agreement with that lab in which the professor and the

company mutually agree on a particular scope of work and its budget to be funded by the company. And then with paying full overhead costs, they then can receive IP rights to that which is invented, using their funding.

MS. MICHEL: Eb.

MR. BRIGHT: Yes. I'll speak from two perspectives. One is in my current role and, to his point, we are inventors. We sit down and come up with ideas on our own. We research those ideas in cadaver labs and benchtop tests and those types of things. We look for other research in the field of intellectual property. Sometimes it's new patent publications. Many times it's through clinical research. So that's -- I consider the research that you find in clinical publications and other journals to be a source of intellectual property that goes right along with the publications in the patent publication system.

The second is from my previous role before joining ExploraMed I was at Guidant Corporation. And Guidant was a very large medical device company, made up of a number of different smaller to mid-size companies that were acquired over the years.

And we had within Guidant Corporation both internal incubators, if you will, to free up dollars to

allow some of our brighter, more creative engineers to think, you know, freeform and try to identify new business areas for the company. Because when you're a public company and you have obligations, fiduciary obligations to your shareholders, you have to make sure that you're generating new revenues year after year, and, in particular, very nice margins. It benefits all of us and it's what our retirement accounts are made up of.

And also we would look to the start-up community or to the university community to also bring forth new ideas, new solutions to problems which we could develop. And I think that it's an important aspect of the overall economy that that exists because there are some people who are very good at coming up with new ideas and testing those ideas, but they are not very efficient in then delivering them to patients, delivering them to physicians to be able to use.

And one of the things that the Guidants of the world, the Amgens of the world and others have going for them is that they have extremely efficient sales and marketing organizations that allow them to get access to the physician community and, ultimately, to patients. And with the infrastructure and the investments that they've made in

that area, it's an efficient use to then take intellectual property that's been created by smaller organizations and move it through that channel.

MS. MICHEL: Dianna.

MS. DeVORE: Yes. So I actually work with a number of different entities that have different ways of creating IP and different types of inventors as well. So one group that I work with is actually a research institute in the Bay Area. They receive a lot of their funding through federal sources, such as NIH. They are doing a lot of the very fundamental research in areas that are extremely important for human health.

And the patents that come out of that are patents that are actually the brain child of the people who are working in the laboratories and doing the research. And the scientists are very, very heavily engaged with the patent process, at least in my particular instance, and work very carefully with the Technology Transfer Offices to try to create not just intellectual property that covers the fundamental finding that they have but that may have some sort of commercial use downstream.

So even in the very early stages with some of my clients we're already trying to craft patents that we think

will be able to create value in some sort of therapeutic development scenario.

In another case that I have, I have one client who is a serial entrepreneur and he has worked in a very successful Bay Area company. He's also started a company in San Diego that was quite successful and now he has a small company. And he does a lot of collaborative research with different universities. He currently has four different agreements in place and a lot of his funding actually comes from the Small Business Innovation Research Program, through the SBA. And so he applies for these grants, has very specific, applied ideas about how certain research might work. And then he forms really good collaborations and working relationships with these different inventors in the universities and research institute to try to further that and to try to create patents out of that. And again, we will then be able to protect some products down the stream for his company.

MS. MICHEL: Thank you.

Becky.

MS. EISENBERG: So I see a couple of problems with these -- some of these early-stage patents that make me wonder how it is that they provide value to firms that are

developing products. One of course is just the timeframe of product development in the life sciences that often early-stage patents will be near their end by the time a product gets to market; and the other is just a general -- just doctrinal obstacles to the validity of these patents that often the Federal Circuit has been holding invalid one way or another, often on written-description grounds; early-stage patents that are trying to stake out a dominate position in future product development. So that makes me wonder why it is that firms find these early-stage patents so interesting or valuable.

MS. MICHEL: And, Suzanne and Stuart, also if you could talk about how your companies obtain early-stage research. To the extent which it's internally developed versus you might like bring it in from a university or a start-up and then how the IP plays a role especially in light of the kinds of problems that Becky has talked about.

MS. SHEMA: Sure.

MS. MICHEL: Or any part of that, because I realize that was a multi-part question.

MS. SHEMA: Yeah. I like your question, Becky. ZymoGenetics participated in the bioinformatics land rush of the 1990s. And what that was all about was pure discovery,

discovering genes in the human body that nobody knew existed.

And there was a race onto the Patent Office to try to claim those genes. And it was -- there were a lot of questions about how does one adequately claim one of those. How much do you need to know about it before you can trust your patent will be good.

Fortunately, we think we guessed right and we filed very robust patent applications. But, getting to your point, Professor, is you have to be very smart about where you put your money. There's a lot of possibilities for discovery and a lot of ideas of how these discoveries can be put to work, but for any company, mine included and I'm sure Amgen is the same way, because development is so expensive, you have to pick which ones you think are going to make it all the way to the marketplace. And a big part of that is assessing the strength of the patent.

So your comment about all of the guidance that we get from the Federal Circuit on written description and now obviousness and other things, it's frustrating in some ways, but in other ways it helps us because there are guidelines, there are standards. So we're able to look at our own patent portfolio and have a sense of which ones are the most

robust patents and applications.

It also helps us assess our competitors' work and look at their specifications and tell will they ever get any claims out of this application. If so, what will those claims be. How broad will they be.

So the body of law that's developed from the Federal Circuit in biotechnology is extremely robust and holds us to a very high standard. Our patents are very difficult to get and very expensive to get. At the end of the day, the data that we have to put in, but it's -- if you pay attention to them and you invest enough time, you can get a good sense of which ones are good.

MS. MICHEL: Suzanne, does your company do the early-stage research itself? Do you import it from a start-up or university or a mixture?

MS. SHEMA: It's a mixture. We have scientists who do very basic discovery work in a focused area. And we work selectively with university professors who perhaps have models that we don't have or who can contribute a piece of the technology that we don't have. But our strategy is basically homegrown.

We do have one molecule that we in-licensed from a university that we turned into a development project and

then we partnered with a larger company, and that's now in phase two. But we don't in-license wholesale. It's mostly homegrown science. And then we very selectively take products forward into animal studies, early-stage human studies, and then hopefully partner.

MS. MICHEL: Stuart, same question. What's Amgen's experience?

MR. WATT: It's a good question. And it's always a question of what's the right mix, what's the right ratio of homegrown versus in-license technology. And our ratio probably changes over time. Typically it's 50 percent or higher is homegrown. Probably right now it's a little bit higher, as I consider our product portfolio.

And we license-in products. We're less and less likely to license-in basic technology. So we're looking for product opportunities, so we'll typical license product opportunities from a small biotech that may have gotten their initial technology from a university, so it may go through a couple of hits before it gets to us.

We do basic research at Amgen. One of the products that we hope to get approval for later this year to treat osteoporosis, the basic biology on bone disease, was done in Amgen in the mid to late 1990s. And so it is a mix.

It's important to have that mix.

I completely agree with the issues Becky raised around the early-technology patents, the term and the scope of those patents. It is a challenge. The best advice that I can give to those in that area is that you need to take a technology to the point where you actually have a more concrete idea of what the product opportunity is. Either the target or the product opportunity. That will make your patents a lot more valuable, to us as well as to yourselves.

MS. MICHEL: Okay. Dianna.

MS. DeVORE: Sure. I just wanted to get back one thing that Becky said. I think -- you know, the Federal Circuit is providing guidance, but we also have to remember that there is the interplay between the Federal Circuit and what they hold and the Patent Office and how they apply it in terms of the prosecution of the patents. And one thing that we're seeing more and more of is there is sort of a squeeze on the inventors as they're requiring more written description, but yet there is this obviousness issue.

So some people might find themselves in a situation where they don't have sufficient written description to be entitled to broader scope of invention and yet if that becomes published, then it's then held against

them in terms of being obvious because the next steps will be obvious, based on what they're saying. So that's one area that we're keeping a really close eye on, but it's an area that actually worries me and especially in certain areas of therapeutic development, like monoclonal antibodies. So, you know, is it obvious to develop a monoclonal antibody to target x? Well, you could say yes. Is it a simple thing? Absolutely not.

And also having to decide which lead you think is going to be a product at the time, given the problems with obviousness following publication, I think that's going to be a really big challenge going forward.

MS. MICHEL: Carol.

DR. MIMURA: Also in the area of early-stage patents, as we've heard, these patents are very crucial to the success of start-up companies that are spawned from university research. But it's just one tool among many. And these start-up companies, they license IP, the investors invest in the IP and the management and the inventors who hold the know-how. But many of the early-stage patents are claiming methods and the companies are often engaging in proof of principle rather than hoping that that first seminal patent will actually have a claim that is on point

to a particular product in the future. So some of the companies literally are starting with nothing more than a marquee name, a very prominent professor and a management team, and that first patent that is just a particular platform that later when proven can provide future patents, improvement patents with the claims that are on point to a product.

MS. MICHEL: What is the role of the patents in getting the funding for the early-stage research? We've heard Carol talk about the university professors developing something in a lab, perhaps with government funding, and Stuart mentioned how Amgen will bring in products rather than that first basic discovery. What happens in between those two events and where does the funding come from and what is the role of the IP?

Eb.

MR. BRIGHT: Okay. Yeah, our companies are venture-backed companies and IP is always one of the very first questions they ask. So, you know, to the point earlier, a management team is very important and IP is pretty much number two right behind it.

The amount of due diligence and the -- you know, when I was at Guidant the amount of time that I spent

questioning the other side about their intellectual property and now that I'm on the receiving end, the amount of time that I spend answering questions on the IP is significant.

MS. MICHEL: Dianna, could you speak to that?

MS. DeVORE: Sure.

MS. MICHEL: We have a lack of experience.

MS. DeVORE: You know, I think we're talking about the raising of money around a patent as though it's going to be just that single patent. I think one of the things that's really important to the venture capitalists I have worked with is the ability to claim the ongoing rights to any of the IP that comes from the future research.

So in terms of the people who are involved with the company, in terms of the management, it's making sure that as the company makes different innovations, that it will have the appropriate rights to those innovations. And that can be through a number of different mechanisms, or it can be something that's developed in-house if the scientist should come directly in-house with the company. I think that and the ability to actually operate in their particular area is very important.

So as well as having the rights, the exclusivity for certain inventions and innovations, it's the ability to

actually practice those. Because just because you have a patent doesn't mean you can practice it. You may have other patents that are blocking in the area or things that may need to be licensed in, and I think with the due diligence process, that's a big part of it, is making sure that not only can you carve out your little area of technology, but that you actually have the ability to practice it without being blocked.

MS. SHEMA: I was just going to make that exact same point. I would agree with Earl that due diligence has gotten more and more rigorous and the questions get better and better with every round of due diligence.

Potential investors, potential acquirers put a lot of effort in determining not only a company's IP position but how exactly are you going to deal with the competition in a space. Very sophisticated questions based on -- they're not even claims pending maybe, it's just specifications that are out there. And we're expected to analyze those specifications, make the best guess you can of which types of claims will issue and will survive.

So the view right from the start-up all the way to the marketplace, everybody's got a really strong, clear view of trying to see all the way through to the market that

you'll be able to carve out a niche for yourself and have market exclusivity for enough time to recover the costs that it takes to make those inventions and others.

MS. MICHEL: Let's talk about that process then. In the early stage, of thinking about the research and trying to assert certain freedom to operate way out into the future, what are the difficulties in doing that?

Suzanne, you mentioned needing to look at a specification and try to predict the claims that will come out of it. How difficult is it to do that? What is the source of the difficulties?

MS. SHEMA: When I talk to our patent staff one of the difficulties is the disconnect that was mentioned between the Federal Circuit and the Patent Office. We can apply what we understand to be the law, and then they say: But then there's the Patent Office, what will the examiners actually do.

And basically what we do is we try to follow the law as it's been stated by the courts, and say we just have to assume the Patent Office will do its job. And then if bad patents are issued, we'll deal with those in the courts.

But just the broader question of the freedom-to-operate analysis, they start -- it's early and often. We

are always checking freedom to operate, from the very first thought that something might turn into a product, and it's checked on a very regular basis. We track all of the players in the space to see how their patent applications are doing, to see what's happening to similar patents in court challenges. And you just really have to make good, educated guesses, assessments, of how your patents and your competitors' patents will come out at the end of the day.

MS. MICHEL: Eb.

MR. BRIGHT: I would say the difficulty is the uncertainty between the Supreme Court and the Federal Circuit and the Patent Office. So for a number of years we had certain, you know, boundaries that we could follow, certain principles that we could follow. And I know that the Federal Circuit, part of what I think they see their mandate is, is trying to bring the bright line test, if you will. Now people would argue that they have set the bar too low in some areas, and so the Supreme Court has stepped in and taken away from a bright line test to a more subjective analysis. And that subjective analysis makes the job more difficult, and especially with the unpredictability.

The other aspect that I think causes us a bit of difficulty is around obviousness. So when I started

practicing nearly 20 years ago, we had a set of factors to follow. The obviousness pendulum started to swing to where it was, you know, harder and harder to find an invention obvious. And now I think we've swung way back past where we started. And then so that uncertainty and that swinging makes the job more difficult because of the unpredictability.

So anything that would bring certainty no matter where the bar is set, I think would help.

MS. MICHEL: When you mentioned the Federal Circuit bright line test, were you thinking of the *eBay* case and obviously the Supreme Court becoming involved in that issue?

MR. BRIGHT: That's one, but I think also, you know, if you look at *KSR*, that's another one that is significant. So it seems like there's been a couple and there's a couple more coming that are problematic.

MS. MICHEL: Becky?

MS. EISENBERG: So I'm interested, a number of you have made observations about the disparity between the Federal Circuit and the PTO, as if the PTO has some different agenda than the Federal Circuit, and I'm trying to puzzle through how -- you know, what -- how you would

characterize. Is the PTO more generous or less generous toward patent applicants? Because I think the views of the PTO seem to be something that the Supreme Court is looking to for guidance on when they should be reversing the Federal Circuit.

So I'd be interested in getting more of a handle in how you see the PTO different from the Federal Circuit.

MS. MICHEL: Dianna.

MS. DeVORE: Sure. I guess the first thing I would say is there is not one Patent Office. There are as many Patent Offices as there are patent examiners. And so there is a bit of variability.

I think most of them have huge dockets. Most of them have a lot of things to get through. And so what their main impetus is is trying to make sure that they actually get through their docket, have the ability to examine things, and to do the best job that they can. And I do believe that.

I think that we need to remember that the people who work in the Patent Office on a day-to-day basis and are examiners aren't necessarily legally trained. Oftentimes they're scientifically trained and they're looking at things very much through a scientific lens, which is good. But

when certain legal aspects get introduced into that, I think it really complicates their own specific process. So that's one thing that I would say.

I also --

MS. EISENBERG: More variability, more uncertainty.

MS. DeVORE: More uncertainty. But I also think that there was a very good point that Eb made, which is the difference between the Federal Circuit and the Supreme Court. One area of uncertainty that I know has been an issue at least with a number of companies I've worked with is this experimental exemption that was introduced by *Merck v. Integra*, which basically says that if something is related to an FDA submission, that it is considered an exemption under 271(e).

However, there is a footnote that says: Oh, and, by the way, we don't mean research tools.

Well, the facts of the case look an awful like they were using a research tool, so the amount of uncertainty that I think was introduced with that particular ruling from the Supreme Court has left a lot of people wondering: Okay, well, what next. And the Federal Circuit is now starting to distinguish that case and to have more

specific fact patterns. But I do know a lot of people both in the pharmaceutical industry but also people who are working in labs, I'm wondering what do we do with these new inventions that actually are terribly valuable that can actually be very useful for therapeutic development, but would they be considered a research tool or not.

MS. MICHEL: Eb.

MR. BRIGHT: Yeah. I would just add that from an overall perspective I think that the Patent Office under the past director was less generous to applicants. I believe that there was a feeling either of his or maybe the collective management of the PTO that there was a tremendous amount of public backlash against bad patents.

And I think that it was a misinterpretation of exactly what the real landscape was in terms of bad patents, but I do think they've become less generous.

I think one other thing that gets lost oftentimes in this issue around bad patents is that the Patent Office isn't the only clearing house. And litigation is not the only clearing house for what are bad patents.

We all, you know, this industry and others, spend a tremendous amount of time studying the specifications, applying the laws ourselves. And if you're sitting at your

seat at Guidance and an inventor comes to you and alleges that one of your existing products infringes on his intellectual property and is trying to extract a damage award from you, very rarely does it actually go to litigation. Because you enter into the conversation with them, you lay out, you know, to the best you can without destroying your attorney-client privilege why you think that he does not have a legitimate claim. And at the end of the day most of the inventors are not willing to step up and try their hand in litigation because they agree with you. They took their swipe at you. They tried to get what money they could out of you and if you decide that it's not worth risk and they decides it's not worth the risk, then you don't end up in litigation.

MS. MICHEL: Could it also be the cost of litigation, though, that's driving that decision, to not pursue the claim?

MR. BRIGHT: Yes. It's another one of the factors, but it's one that if you are willing to make the investment, you're going to reap the award if you have a good claim.

MS. MICHEL: Okay. Suzanne.

MS. SHEMA: Just back on this point between the

difference between the Federal Circuit and the Patent Office. As a matter of policy, we need to fund the Patent Office. We need to give these people enough time, enough workers to do the work. As we've said, biotechnology is very dependent on patents, and that means a well-functioning Patent Office. That means they need to have enough people there.

The other disconnect sometimes between the Federal Circuit and the Patent Office is when the Federal Circuit makes a statement beyond what was perhaps necessary in the holding, and I'm thinking of *KSR* here. The facts of that case, it's not difficult for me at least to see that that invention was obvious with current, with existing law. And for the Federal Circuit to induce the notion of obvious to try, what scares us in biotech is what will the Patent Office do with this new weapon. I'm saying because it was obvious to try, it's easier to leap to a conclusion of obviousness, and that's particularly in hypothesis-based disciplines, as is biotech.

You do an experiment because you can hypothesize what will happen. It's a thin line then to cross of saying, well, it must have been obvious to try. And while it may have been obvious to try, you don't know how the results are

going to come out.

So my hope is that the issue gets corrected in the Patent Office and the courts, but at this point with the *KSR* language, that's causing some consternation and fear of what the Patent Office will do.

MS. MICHEL: We've been talking about the difficulties in identifying whether there's freedom to operate in a particular area. How does that uncertainty affect the funding decisions? Of a venture capitalist or maybe even of a particular company that's thinking of going down a particular road, how much certainty do you need to decide, okay, this is an area where there's open space, where I might be able to get a patent? Any thoughts on that?

MR. BRIGHT: I would say that it's dependent on the size of the opportunity.

MS. MICHEL: Okay.

MR. BRIGHT: So the larger the opportunity I think the less certainty you need at the earliest phases, and so it's kind of a seesaw. But I would say that in all phases there is a fundamental level in which it is very important because, to your point about litigation is expensive, nobody wants to make investments in an early stage, prove out the

concept works, develop a product, and then at the end of the day not be able to commercialize that technology.

The litigation is expensive, but not nearly as expensive as the development. Oftentimes for us to bring a product to market in the medical device space, we're spending usually in the neighborhood of 75,- to $100 million in order to bring that to commercialization. So once you've made that kind of investment, you don't want to be stopped at the doorstep of the commercialization.

MS. MICHEL: How -- oh, Suzanne.

MS. SHEMA: They're all case-by-case analyses. You look at the claims. You look at whether it covers the product or a method of making the product. You look at whether you can engineer around it. And, very importantly, what's the expiration date. Because, as we know at least in therapeutic proteins that are used as therapeutics, it takes a long time to get to market. So will the patent even be around by the time we launch the product.

MS. MICHEL: Okay. Dianna, and also I'm wondering how savvy are the decisions that venture capitalists make in deciding whether to inject those key funds with regard to these pretty technical patent issues that we're talking about with regard to freedom to operate?

MS. DeVORE: Well, I think most venture capitalists use attorneys who are trained, be they in-house attorneys at the venture capital firm or attorneys such as myself, to actually look through the portfolios. So generally the people who are looking at the questions of freedom to operate have a pretty good idea about that area of technology because they tend to be specialists in it. And so I think that the freedom-to-operate analysis is getting more and more savvy.

I do think that in terms of the freedom-to-operate analysis, one thing people are looking at more is also not just are there patents out there that could be problematic, but is there the possibility of licensing those patents in. So if the patent that is problematic is held by a vendor or a university that is, you know, giving nonexclusive licenses, that's one thing. If it happens to be held by who you think will be your closest competitor, who just doesn't want you to get the product to the market, that's another thing entirely.

So it's a case-by-case analysis, but it's also a little bit more sophisticated in terms of not just is this going to be a problem but if this looks like it could be a problem, is there a way to solve it, be it design around or

actually working with the other group. And a lot of the companies that I worked with, they go and they approach these other groups and sometimes it even leads to a collaboration that can be fruitful.

And that's another thing that venture capitalists are looking at right now. With a lot of the very-early-stage opportunities, they're not just looking at opportunities singly anymore. They're saying, well, you know, this looks really interesting, but there's this other opportunity over here that we think will be complementary. And if you put the IP portfolios together, now you really have something. So there's more and more bundling of opportunities at the very early stage that we're starting to see in order to create a stronger patent portfolio in the early stages of the company.

MS. MICHEL: This concept of licensing-in to create freedom to operate is interesting. There was discussion in some of the academic literature about the problem of the anticommons, that there are just too many patent rights needed to make any particular product, that perhaps no one would pursue that product and that research.

Do you see that happening, for instance, in the situation in which there is not enough open space or do you

see it being -- as taken care of through the licensing?

Or, Becky, I know some of the academic research just talks about professors, at least, going ahead anyway and doing the research. Do you have any thoughts on that?

MS. EISENBERG: Yeah. I'd really be very interested in hearing from the other panelists on this, so I don't want to say much. The academic literature, I think, has been focusing, as you say, Suzanne, mainly on the really early-stage, upstream research and finding that mostly people ignore patents. But of course what really matters is, are these technologies getting developed further? Are they being brought to market?

When will a lot of patents look like an opportunity for partnering and creating a broader, strong portfolio, and when will an abundance of patents in an area look like, you know, maybe we really ought to be investing somewhere else.

MS. MICHEL: Another concept related to licensing -- please respond to that. I didn't know if anyone -- also when those licenses are exclusive versus nonexclusive then, and what the thinking is there when dealing with this kind of thing. Eb.

MR. BRIGHT: I'll just speak to an example of the

drug-eluting stent. So the drug-eluting stent has a catheter, it has a stent. It has some kind of coating on the stent and it has some kind of drug on that stint. And so typically there's usually at least 50 to 100 different patents that cover different aspects of that stent system. And so in order to bring forward a next-generation stent system, you either need to wait till certain of the patents have expired, which in the catheter art that is beginning to happen -- most of them are more than 20 years old now or will be in the next two to three years -- or you need to enter into licenses or cross-licenses. And that, generally speaking, is what has occurred.

I would say that in some technologies there has begun to be in the medical device field an, essentially, hallow or cloud of a fair number of patents. And I think that that's a good thing, because generally what that means is that that marketplace for that idea is saturated. And it's important for people to now turn their attention to other areas that aren't being served and use their creative talents in that new area. And then it allows the people who are most efficient and who have established those first set of patents to commercialize their technologies, get the payback for the investments they made, and then move on to

next-generation technologies.

MS. MICHEL: Carol, when universities license out patents in this sphere, biotechnology and the life sciences, how frequently are those licenses exclusive? Are they offered nonexclusive and what's the thought process?

DR. MIMURA: I would say that about half are exclusive and half nonexclusive. For the most part, start-up companies and small companies generally require an exclusive license to anything that would require a long and arduous R & D timeline, something that's very expensive and very long to develop.

Certainly research tools or something that should be made very available to any and all comers are generally licensed on a nonexclusive basis, but those are very general guidelines.

Certain industries such as the IT industry prefer a nonexclusive license, often royalty-fee nonexclusive license. They're often interested simply in freedom to operate. The rationale there being that if they're licensing-in something that is going into a chip and that chip is already covered by 250 patents, they really don't want to have a running royalty to the licensor to commercialize what is simply an incremental improvement over

the prior art, and that is their proprietary product. So there are some industry-specific differences in IT, the chemical industry, the oil and gas industry.

Certainly in biotech most of the licenses are exclusive, to induce investment.

MS. MICHEL: Stuart, you mentioned that Amgen will be interested in bringing in a product from a start-up. Could you talk about the role of the patents in Amgen's making that decision but also the role of nonpatent aspects of the start-up, like the management team. What goes in to making the decision of whether a particular start-up or product is one that you'd want to bring into the company for further development?

MR. WATT: It's a mix of factors, it's a balance of considerations. We look at the product opportunity. We look at the competition. We look at certainly the patent landscape. And any of those can be a no-go. Certainly the patents are a no-go and frequently they are where we don't have either freedom to operate or we don't have sufficient protection around the product or we don't think we can develop sufficient protection around the product in order to provide exclusivity sufficient to reward the investment.

MR. BRIGHT: I'll just add one other thing. I

think that the people and the underlying technical expertise, if you already have the technical expertise in-house, then you're less likely to be interested in keeping the people and it's more about evaluating the technology and the IP. But if they do bring a core aspect that you don't have in-house, then you're more likely to want to try to encourage the people to stay on and make that a bigger part of your analysis.

MS. MICHEL: Stuart, are the people ever a factor for your company's decision to bring in a product or a start-up?

MR. WATT: Sure. We've -- in a broader sense, we've acquired early-stage research companies, and we've done a couple here in the Bay Area where the people were an important consideration into what are we acquiring, because they didn't have product opportunities, immediate ones, and they had early-stage research. And so we're looking at what kind of people can we ask to join Amgen and can they participate in our research efforts. So, yes, in that sense people can be a very important consideration. In fact, they were the main purpose of the acquisition.

MS. MICHEL: Okay. Carol, I know U.C. Berkeley has a very interesting arrangement with the -- in creating

the Energy Biosciences Institute with BP. Could you just describe that a little? Tell us about that?

DR. MIMURA: Sure. BP, as a major oil and gas global enterprise, was interested in exploring alternatives to fossil fuels. And they hired, several years ago, Steve Koonin, who had been the provost at Cal Tech. And when he came to London he said: Well, you know, this would seem to be an impossible task, to look at the feasibility of biofuels since BP has over 100,000 employees but we only have three biologists.

So again he was faced with this classical, you know, build it in-house or partner or acquire the expertise. So he conceived a global competition to compete for $500 million in research funding on alternative energy over a ten-year period. And the U.C. Berkeley Lawrence Berkeley Lab and the University of Illinois at Urbana-Champaign submitted an application, according to the guidelines in the RFP, which outlined several parameters, including that the proposal would have to propose both open and proprietary research and would have to include one option to obtain IP rights on a nonexclusive, royalty-fee basis. But other than that it was somewhat wide open because, after all, they were interested in what some of the preeminent universities have

come up by way of a proposal.

So they realized also that the things that BP didn't have that they would want a partner to have would not only be in the area of hard sciences -- engineering, chemistry, biology, virology, structural enzymology -- but also land-use issues, because, after all, feedstock and agricultural economics are the component of biofuels, and schools of public policy. So they were focusing on schools that could deliver a package.

So -- and in particular we were very excited to apply because BP also had the foresight to realize that the early inventions coming out of this new science of biofuels would be very early stage. And, in typical fashion, they would probably be commercialized through start-up companies. And of course Northern California is a great place to start companies. We have no shortage of private capital here to fund our start-ups and we have a very entrepreneurial faculty and very entrepreneurial environment.

So the particular hypothesis that we were drafting and negotiating a contract to was that the great corporate labs of the world, such as Bell Labs and Xerox Park, are on the decline. And so the hypothesis is is there a role for academia to step into this void, to have somewhat of a

hybrid situation where the really fun research in a corporation that would normally be done in a corporate research lab, can it exist through a unique and new public-private partnership.

So the agreement turned out to be a very large sponsored-research agreement. Since it is for a very large amount of money over a decade, we're running just as you would a federal-granting agency like the NIH, where professors from all three institutions can apply for funding in a given year, proposing a specific project and its budget, and then a particular slate of projects from all three institutions is funded on an annual basis.

There's a governance structure to the energy biosciences institute consisting of a governance board and an executive committee. The executive committee, vets the proposals according to peer-review processes and proposes the slate of proposals as a whole to be approved or not by the executive -- by the, excuse me, governance board. If it's approved then it's simply funded. In the first year, about 40 projects have been funded and one-third are in nonscience areas, consistent with the goal of studying the areas of socioeconomics, land use, and the like.

So there's also a real estate component to this

deal. U.C. Berkeley and the University of Illinois are actually renting space to BP. And in this rented space BP can perform proprietary research.

The open research done in our academic laboratories, as usual, is typically performed by students and postdocs. That research is all owned by the academic institutions. Research performed in BP's proprietary rented space is owned by BP and can be confidential.

The open research will be published and is just according to business as usual, academically-appropriate research that will be published often and consistent with a particular dissertation.

And, let's see, what else. About 50 research groups have been funded in the first year, and 130 faculty are involved.

In terms of the licensing, if IP arises from the funding the owning institutions can patent, but BP will always have a nonexclusive license to practice that which it provided funding for. BP can also elect, if it chooses, an exclusive license to those IP rights.

And all of our exclusive licenses, of course, because we license with the goal of public benefit, retain rights to practice those inventions for our own behalf, on

our own behalf, and to transfer those rights to others in the nonprofit sector for their education and research needs.

We negotiated a cap on patents in terms of remuneration. Should BP elect an exclusive license, they only have to pay up to a maximum of $100,000 per year per patent. However, if something is extraordinarily successful, beyond our wildest hopes, there is a bonanza clause stating that if in such an event then that $100,000 cap goes away.

There is also a clause, because BP like so many other companies, is interested in freedom to operate, if to practice the foreground IP, BP requires a license to the background IP owned by one of these participating institutions. To the extent that background IP is necessary to practice the foreground IP and to the extent it's available, BP may license those patent rights as a bundle for a prenegotiate fee of $20,000 each or $50,000 for a package.

MS. MICHEL: Is this a unique kind of agreement in terms of its scale or...

DR. MIMURA: It is the largest academic university agreement to date. And it combines federal, -- because the Lawrence Berkeley Lab is DOE-funded -- state, and industry

funding in sort of a triple helix of funding and resources to bring to bear on a common problem that we all care about, you know, finding alternatives to fossil fuels.

MS. MICHEL: Are there other such collaborations between the private sector and academia on a smaller scale? Are you seeing more of those and do you see them in the life sciences?

DR. MIMURA: We have hundreds of such sponsored research agreements, but on a much smaller scale. Usually one company and one lab or one company and several labs, especially in the life sciences.

Often biotech, life science companies license IP from us because our IP is so very basic. They often choose to then sponsor research in that same lab to fund the improvements and make sure they can have an exclusive license to what is invented, using their follow-on funding.

It's unique in that we have the real estate component collocating BP researchers with open researchers in an academic environment.

MS. MICHEL: Is this a relatively new trend or something that's been going on for a while?

DR. MIMURA: The practice of public-private partnering is not new but the specifics of this agreement

are unique so far and the magnitude of the agreement.

MS. MICHEL: Have others had any experience with this kind of relationship between private sector and academia or does it sound like a useful thing? Would you expect to see more of it in the future? Or any thoughts on how maybe it ought to be pursued?

MS. DeVORE: I guess I have one question on that. Most of what I have worked on in terms of these sorts of partnerships is, you know, as Carol said, much smaller and limited. And I think that has a lot of pros and cons.

One question I have as to this bigger construct is if BP has a nonexclusive license to anything that they have funded, how will that impact on anything that the University of California might want to do with other companies going forward and will that, in effect, be a sort of chilling effect on the technology that BP decides not to exclusively license?

DR. MIMURA: Right. That's a good question. Thank you. They have a nonexclusive license or an exclusive license, for that matter, only in their field. So to the extent something is applicable to another field outside of energy, that particular license won't block the development of a new application, another application.

MS. MICHEL: Okay. Thank you. A fascinating area. It will be interesting to see how it develops over time.

When we were talking earlier -- I'm going to jump back to an earlier topic of looking at freedom to operate -- we did not touch on continuation practice and the problems that continuation practice might pose in your ability to predict the claims that can come out of a particular patent. Do you face that issue, do you see it as a problem?

And, conversely, how important is continuation to your own ability to protect the inventions that you need to invent? How do you balance those two concerns?

Eb.

MR. BRIGHT: Do you want to start or -- okay.

MS. MICHEL: Suzanne -- Eb. No. Eb. Sorry. All right.

MR. BRIGHT: So continuation practice is extremely important to our ability to build our patent portfolio family. There is usually a certain number of inventions that come out of our overall product. And sometimes those are, you know, divided out by the Patent Office and by restriction requirements, so we have divisionals. But a lot of times there's a number of aspects that we think are

patentable in various combinations that are still important to the product. And so being able to use continuation practice to go after A, B, and C; and then A, B, and D is very important to us.

In terms of our freedom-to-operate analysis, it does, you know, create work for us to do when somebody else owns the portfolio and they have pending applications going. It's one of the very first questions we ask ourself once we see a patent that's issued or we see a publication that's interesting, is we go to see if it's still got an active family and begin to study the file histories of each of them.

It goes back to our issue before about the predictability and the case law, and being able to look at the specification and making a reasoned judgment as to what the Patent Office is going to allow and what they're not, or what ultimately the court is going to uphold, even beyond the Patent Office.

And I think Stuart made an important comment just a little bit earlier about making a decision about whether or not to acquire a company. It would also apply to the decision about whether or not to further commercialize a technology. And that is what is the -- you know, the

freedom to operate -- the adequate amount of protection around a particular idea and that oftentimes you will take a pass on a company because you look at their IP and you say, I could design around that or others could design around it, and so therefore it doesn't have great strength and you take a pass on it.

MS. MICHEL: Suzanne.

MS. SHEMA: Okay. So from the point of view of protecting our own inventions, continuation practice is extremely important, at least for two reasons. One of them is it takes a while to educate the examiner. Our applications are very thick, very complicated. They have to be in order to satisfy 112. We have to disclose a lot. And, frankly, the examiner often doesn't read the whole application the first time through. So the more opportunities we have to communicate with and discuss with the examiner, the better the examination will be. And you just need continuations in order to do that.

We also have situations where you learn more about the particular variations of your invention as data are developed. So more and more our inventions have to be claimed structurally. You can't just claim how they perform, what the function is. You have to claim the

structure, for example, the amino acid sequence. And more and more our claims are being narrowed to instead of having a huge class of amino acid sequences, you get a smaller class or more fingerprint claims.

MS. MICHEL: And the reason for that is the written description requirement?

MS. SHEMA: Is the written description requirement, yes, so the increasingly rigorous 112 standard that we're held to.

So you may disclose in your initial specification a broader range of structures and then as your scientists do experiments on them, you learn something particular about one of those structures, so it's fully disclosed but you may not have claimed it as specifically as you wanted to the first time through. So continuation practice is appropriate there.

So the 112 standards that have developed in our industry help us to analyze our competitor's patents. So the rules that we live under -- you can't just claim things functionally, you've got to claim things structurally, there have to be representative samples -- what is used against us we can also assume will be used against our competitors, and it really helps us to analyze the scope of the claims that

they'll get out of the Patent Office and that will survive in a court challenge.

MS. MICHEL: Stuart.

MR. WATT: I agree that the continuation practice has great relevance to our industry and it's not an effort to enlarge the scope of what you're entitled to claim. It's more an effort to come to an agreement with the patent examiners, what's the right language, what are the right words to use to describe your invention in the claims. Having said that I'll come back to a contrary example in a second.

And I think the purported vices of continuation practice are largely overblown. And they've largely been addressed by the 20-year patent term and the availability of prosecution now on public databases, so you can track applications in the Patent Office and see what's happening, see what arguments are being made, see what the examiner is saying about the application. So there's very little surprise anymore in what things might issue.

The contrary example is we were developing a product that's actually on the market now. And for many years a competitor, a patent portfolio was pursuing claims that had certain limitations in them so it clearly did not

cover our product. And so we felt comfortable in going forward in development of that product in putting this billion dollars of investment into the product. Somewhere along the line someone woke up. I don't know whether they got wind of our product or somebody else's product, but they changed direction in the prosecution strategy and were able to obtain claims that arguably did cover our product. At least we weren't surprised, we saw it coming because they were publicly available through the Peer Database system. And, fortunately, for the product and the patients who needed this product as the initial therapy in a new area, a license was available. And so we were able to take the license to that patent when it did issue with claims that were redirected through continuation practice.

MS. MICHEL: Did you ever get into litigation over that issue before the license?

MR. WATT: No. We avoided the litigation through the license.

MS. MICHEL: Becky, and also I'd like to hear from others, has anyone else had that sort of experience of watching claims morph through the prosecution, to go in a direction you might not have anticipated? And, Becky, whatever other comments you wanted to make. Thank you.

MS. EISENBERG: Yeah. No, I just wanted to say that as an outside observer I have found the debate over continuations particularly fascinating and sort of surprising of how strongly people are attached to the status quo, which doesn't -- I wouldn't have expected from the outside to be entirely in the interests of the innovation community.

I would have thought maybe it serves the interests of the PTO, which now wants to change it, more than it serves the interests of the innovators. So I'm really sort of puzzled. I kind of want to push and hear more about this, because I would think that, you know, it's nice to have some flexibility for your -- I mean like everything else in the patent system, you feel differently about your patents than you feel about other people's patents, but to the extent that freedom to operate is an issue I would think that the current system of continuation practice would increase the costs of trying to figure out. I mean Suzanne was talking earlier about needing to really look at your competitor's specification and sort of think through what else they might have up their sleeve that might step forward to sting you later on.

And that seems like a problem, that you would want

more transparency, more certainty; and, moreover, you would want the Patent Office not to have to play this game with you by entering rejections that you then address through continuations, but rather to just deal with this application now and let's figure this out. So I've really been sort of surprised at the patent bar's attitude towards continuation, so they really made a virtue out of what -- out of the present because they know it and have adapted to it, even though it's really kludgy and weird.

MS. MICHEL: Dianna.

MS. DeVORE: I guess to address the first part, something I think Suzanne has brought up is all of these things are a double-edged sword. So the things that provide you clarity with freedom to operate, others can use against you on your patent portfolio.

And so if you have some wiggle room in terms of being able to use continuations to capture material that's already in the initial specification, you know, that can be used to your advantage in certain circumstances, just like it can be used to the advantage of your competitors. So with all of these things it depends on which side you're on, how you feel about something at any given time.

I think with continuations there's just a couple

of points I would like to make. The first is it's the combination of continuations in claim limitations that could also be deadly. So if the issue of claim limitations, if you really are limited to the number of claims that you can have in any given patent application, that becomes especially difficult if you have a disclosure of a number of different, say, chemical classes, because then you might be forced upfront to try to decide which ones are important now when the research that's going to tell you what really may become your product hasn't been completed.

So I think that the claim limitations were an issue and I think that you can't have both the claim limitations and the limitations on continuations. I think that would be deadly.

MS. MICHEL: But by claim limitations you mean limitations on the number of claims?

MS. DeVORE: That's correct. That's correct.

MS. MICHEL: Stuart.

MR. WATT: Yeah. I'm trying to answer the puzzlement of why continuation practice is so important. I think it's rooted in the practice of the Patent Office and the way the examiners workload is treated, the way it's scored, the way they're rewarded.

MS. EISENBERG: But wouldn't you rather fix that rather than stick with this?

MR. WATT: Yeah. And when that's fixed, then we'll back off on continuations. But you can't appeal everything, so you need other avenues in order to continue to pursue your rights in the Patent Office besides just simply, you know, coming to, you know, final fisticuffs with the examiner and then trying to appeal that decision. So it is -- it's a very useful tool in order to pursue your full -- full scope of inventions that you disclose in your patent application.

MR. BRIGHT: I know you asked the question about how often, and at Guidant it was constant. I mean it was, you know, every month somebody in my group was working on the issue of what's going to come out of a potential continuation from -- could be an individual inventor, could be a university, it could be a corporation.

But the thing about it is that it serves a useful purpose. Time and time again our engineers, we would go to them and say: Look, looks like that this is a probable outcome that could come from this particular application. We need to think about design-arounds.

And the first reaction from them was like:

There's no way. I mean this is it, I mean this is all we can do.

But then when you provide them guidance, offer them some alternative teasing questions and things like that, invariably we always came up with a design-around solution, that we ended up building a better product from. And so I think it serves a big purpose, especially as, you know, Stuart said, there really are no secrets out there anymore with everything being published.

MS. MICHEL: Suzanne.

MS. SHEMA: So I just add that in the ideal world, the Patent Office, the examiners would have time to read the application and to give it a good examination, but we live in the real world. And so we are -- we know we have to deal with this Office, with all of the pressures that it's under. And so from biotech's perspective, we're concerned with even more burden that's being proposed to be put on the Patent Office, for example, with postgrant oppositions. So we still don't know what our situation's going to be going forward as far as full funding for the Patent Office and training and time for people. And if now they're asked to do yet another thing with postgrant oppositions, it doesn't make you hopeful that they're going to be able to handle all

of this.

I'd love it if they could, but then as a policy decision we as a society have to decide to give them the resources they need to get all of this stuff done.

MS. MICHEL: Do you have any concerns about the ambiguity in terms of claim interpretation, predictability of claim scope for a claim that's already been issued, or do you feel like when you're assessing freedom to operate, when you're thinking about what you will get, the claim scope is fairly certain? Any thoughts on that?

MR. BRIGHT: Yeah. No, I would say with the recent court decisions from about 2006-2007 until now, the patent protection has been severely eroded and there's been an unprecedented amount of uncertainty put in to where case law is going, what are the necessary claims scope in any given patent.

MS. MICHEL: When you say the patent protection's been eroded, do you mean that claims are being interpreted more narrowly? Was that -- or are you referring to many, many other concerns also?

MR. BRIGHT: I would say many, many other concerns, but I think that that last point is true. If a patent is going to be held as valid, it's necessarily going

to have to be construed more narrowly, otherwise in the current system it's unreliable.

MS. MICHEL: Yeah. Dianna, I was talking about the medical device area, how do you feel about that in the more biotech area?

MS. DeVORE: Well, I mean I think one point I would want to bring up is that especially in the post-*KSR* period that people are more and more looking at reexamination to try to redefine the scope of issued claims, as well as litigation. And, you know, I think being able to have clarity that way, again it depends which side you're on, but reexamination is becoming a much more common tool in conjunction with litigation than it used to be. And I think people are looking to have the Patent Office reinterpret the scope of certain claims, especially in the light of some case law that now applies that may not have applied at the time they were initially examined.

MS. MICHEL: Stuart.

MR. WATT: As we all recognize, claim construction often is decisive in these issues. And unfortunately in too many cases we don't know what the claims mean until the Federal Circuit speaks. And oftentimes the Federal Circuit is not the best-positioned body to determine what these

patents mean. They don't have the technology understanding.

The patent, the claims are written to somebody of skill in the art, and the Federal Circuit doesn't have -- even though their caseload is down right now, they don't have the time and understanding necessary to really dig into what these claims mean. Oftentimes the district court judges are better positioned to do that. They hear the witnesses, they understand what the patent owner was trying to claim in the Patent Office.

We had a case that we pursued, did not get cert. from the Supreme Court, but the issue basically was more deference by the Federal Circuit to district court judge's claim construction, because there are so many underlying issues of fact, the understanding of the science that play into this, and it's just not something that can be readily interpreted based on an appellate record.

MS. MICHEL: In biotechnology is it true that the scientific terms are fairly well defined? Does that help you achieve a greater level of certainty in your claim interpretation?

Suzanne.

MS. SHEMA: The biotechnology community, researchers, companies, have put a lot of effort in to

coming up with common languages, common nomenclature. And, to some extent, the Patent Offices have helped us.

We have the Sequence Listing Rules that are part of the Code of Federal Regulations that say how we must describe the structural aspect of our inventions. There are organizations like HUGO and GO that work to try to come up with common language about genes' functions and their structures. So on a voluntary basis participants in the biotech community are trying to come up with this common language.

I'm also encouraged that the law of indefiniteness seems to be growing and I think there are other industries that could benefit from this even more than biotechnology.

Getting back to one of the questions you asked about, do we ever look at a patent and struggle with what does it mean: Of course, you always do. You always have to analyze claim construction, but there have been times where I've looked at a patent and I say I can't even tell from the specification what they mean by this.

And, this was several years, I turned to the body of law on indefiniteness, and it was not very well developed. That is changing with the *Datamize* case and with cases that are coming in its wake, which I think it's very

encouraging for the IT industry. I'm not a member of the IT industry, but I try to put myself in their shoes, that the more you get guidance from the courts where they say you cannot figure out what this term means, the patent is invalid, the claim is invalid.

My hope would be that just as written description helped us in order to interpret our competitors' patents, that a clearer body of law about 112 second paragraph can help people in the IT industry to evaluate their competitor's patents, and to feel more confident that the patent is not valid. Rather than it being a quality issue, let's go back to the original terms of patent law, it's an invalid patent or an invalid claim.

MS. MICHEL: What sort of changes has some of the Supreme Court decisions -- let's start with *MedImmune*, since we've talked about *KSR* a little bit -- has *MedImmune* changed the way that people have had to approach their licensing negotiations, the deals? Has it had much of an effect?

Okay, I'm going to take that as no effect. It's not a problem then, okay.

MS. DeVORE: No, actually I think people are just more aware that when they actually drop their license agreements, that they make sure that if somebody decides to

sue them that that is a termination of the license. So I mean people have basically responded to the *MedImmune* issue by making sure they have the appropriate language of the contracts.

MS. MICHEL: We've talked a bit about *KSR*. *eBay*, we'll just go down the list here. *eBay*, is that raising any concerns for you in the new approach to evaluating injunctions? Perhaps it's not a major concern then in this.

MR. BRIGHT: You want me to take that one? It's a major concern for me. Go ahead, Stuart.

MS. MICHEL: Stuart.

MR. WATT: Amgen has a high-profile case, that the issue of injunctive relief was decided after *eBay* and one of the first instances where the *eBay* factors were applied in the context of a biotechnology patent case.

And we had a very fine judge, federal judge in Boston that for a while was contemplating out loud the prospects of granting a compulsory language to our competitor. And compulsory licensing in our industry would be devastating. And fortunately in his own words he pulled back from the brink and saw the wisdom and the value in enforcing patents. Patents are an exclusionary right. That's what the essence of a patent grant is. And if you

don't have that, then the patent system is undone.

And he saw the value in granting the injunction. We fully met all the factors and the injunction was issued. So it is a great concern. We think the courts will sort it out and we think they're headed in the right direction.

The Federal Circuit case that prompted the *eBay* decision, again it's this rigidity that the Federal Circuit is taking in some of their cases in order to provide more direction to the district courts that prompted the Supreme Court review and the Supreme Court reaction. And so it was unfortunate.

You know I think in other industries, in other circumstances the *eBay* decision opened up a lot of doors. It took away some of the hammers that some of the patent owners were holding against the accused infringers. But in biotechnology, in the therapeutic product business as a whole, we need the ability to enforce our patents and excluded competition for the life of the patents.

MS. MICHEL: Eb, you mentioned that it is a concern.

MR. BRIGHT: Yes, especially for a small, you know, start-up company that is bringing new products to market. With the larger companies being able to make a

calculated decision about the likelihood of a permanent injunction has gone down, and they are potentially going to be able to get what in essence is a compulsory license after the litigation, that would be a business decision that, you know, would be easier for them to make based on their existing revenues and profits. And that would be to the disadvantage of start-up companies.

MS. MICHEL: The law will -- Suzanne.

MS. SHEMA: So from ZymoGenetics' perspective, we frankly have more discoveries than we can afford to develop, because of the cost of clinical trials. And so we could find ourselves in a situation where a competitor is developing a product that we have a patent on, but we don't have the money to fund development of that product. So I'll echo Stuart's thoughts, that we have to avoid imposing even more bright lines on these evaluations and say: If you're not developing the product that's covered by the patent, you're not entitled to an injunction because not all situations are the same. You may simply have to choose other products that you're developing at the time, but you've still gotten a patent on that technology, you've still delivered that invention to the public, and you should be entitled to your injunction after applying the standards.

MS. MICHEL: The law of willfulness also changed considerably in the past few years with the Federal Circuit *Seagate* decision. Has that raised any thoughts, any concerns, any ways of approaching these kinds of business deals differently when you're licensing patents? Has that been an issue for anyone?

MR. BRIGHT: No.

MS. MICHEL: Not so much. Okay, life is going on.

MR. WATT: Willfulness, it was an area of the law that needed reform, and we're hopeful that the *Seagate* decision will lead to that, will lead to the playing out of the law and given particular fact scenarios to a rational position where people who take positions based on third-party patents are able to do so reasonably and they're protected from that. We think that's where it should be.

I also need to address *KSR*. I didn't jump in before when we were discussing it.

MS. MICHEL: Oh, please do.

MR. WATT: But obviousness is a main issue in our area. And Eb is right, the pendulum has swung back significantly into what is obvious in biotechnology.

We had a recent case decided by the Federal Circuit that reviewed the Patent Office's application of *KSR*

to hold a gene claim obvious, even though the prior art did not contain any sequence or any structural information for that gene. And, in essence, the Federal Circuit held that the *KSR* decision overruled the *In re Deuel* standard on which biotechnology had lived for a decade.

And so the Patent Office is taking a much more aggressive view of obviousness in biotechnology. And, based on *KSR*, the Federal Circuit seems willing to affirm that -- although I have to say we think the facts of that particular case are very distinguishable from most circumstances that we face -- but what it will mean is that we will be bearing the burden of showing why we are entitled to a patent as opposed to the statutory role of the PTO, which is to tell us why we're not entitled to a patent. And so applicants can expect they're going to bear much more of the responsibility to explain what about their invention was nonobvious, unexpected, and have to go through that proof, and that opens up a lot of issues with respect to disclosures and potential and in equitable-conduct issues, all the things that are we are very much concerned with in our dealings with the Patent Office.

MR. BRIGHT: Although I would just add onto the end of there, we have a situation right now where we've

taken on that burden of proof and we have clinical articles that have been written about a technology that we commercialized in which, you know, physicians have studied it and said: Unexpectedly this works; you know, surprisingly this works. Our commercial success has been one of those classic revenue ramps that everybody expects to see, a hockey stick. And we have an examiner and a supervisor who have looked at all that data.

And every time we present it and add to it, they simply sweep it aside and they say: Well, here's two new references, none of which are new. They've been in the file history all along. It's just a new combination of a new argument. And they say: Applicant's information, responses moot in view of the new grounds of rejection.

MS. MICHEL: Okay. Becky.

MS. EISENBERG: Isn't, though, the needing to show surprising properties inherently problematic in the biopharmaceutical industry? Because the reason that Suzanne was alluding to earlier, you really want to confirm your hypothesis, you don't want surprising -- surprising properties are usually going to be bad news, right? I mean if you're needing to come forward with surprising data, aren't you --

MR. WATT: It's not surprising properties. It's things that could not have expected. It's the results that although you hoped for that result, it could not have been reasonably been expected by a person skilled in the art. That's the standard. That's what you're trying to argue against.

MS. DeVORE: That's right. And I think one of the issues, just from a prosecution point of view, is also if you are going to be combining references or had to be a suggestion to combine the references. And *KSR* effectively wiped that out, which also means that you can take references from very disparate areas of biotechnology and they're like: Well, you put these two together, it's obvious in view of that. When, truly, one skilled in the art probably wouldn't have gone to that length of, you know, oh, I'm going to do a search of everything here, and this looks kind of relevant and this is kind of relevant, so I'll put them together.

So that has made it very difficult from a prosecution standpoint to argue against obviousness, because now sort of the world is their oyster in terms of what they can combine to create an obviousness rejection, even if it wouldn't really be practical if you were one skilled in the

art.

MS. MICHEL: Carol, when start-up companies come to you to license or when a university is thinking of licensing out the technology, do these concerns about the potential invalidity of any patent that might emerge come into play, are they discussed?

DR. MIMURA: Sure. Licensees are, especially start-up companies are often cash poor and then they always must take into consideration how long and arduous this process of patent prosecution will be and freedom to operate, among all the other things they do in the form of due diligence. Many of our licensees are small and medium companies, and they just don't have unlimited resources to spend.

MS. MICHEL: I'll take the last -- oh, Dianna.

MS. DeVORE: Oh, I'm sorry.

MS. MICHEL: Do you have an additional comment -- okay.

MS. DeVORE: No, I just forgot to put it down. Sorry.

MS. MICHEL: Thank you. All right.

In our last minute here I want to see if any of you have thoughts on patent damages and the potential

statutory changes to the system and how that might affect the biotechnology industry. Are damages important in how your companies and clients value and use their patents or the potential for the size of the damage awards? And do you have concerns about potential changes?

Eb.

MR. BRIGHT: Yes. I think they're extremely important. And, you know, the mandatory apportionment of damages that could potentially occur under the law in the House bill as opposed to the Senate's compromise I think would be extremely damaging.

I think the Senate has come up with a nice compromise in the situation in allowing the judge to be a gatekeeper. In essence, to try to simplify the issue for the jury. I would acknowledge that damages are an extremely complex area of the law. They're an extremely complex issue in all the litigation that I've been involved with. And so using the judge to help clarify the issues for the jury I think is very important. But, at the end of the day, mandatory apportionment would be very damaging to us.

As I mentioned earlier, in any given product there are 50 to 100 patents that cover that. And the smallest change in a particular product, the smallest addition to it

can make a tremendous impact in its market acceptance, in the response to the marketplace of buying that particular product and technology.

MS. MICHEL: Thank you.

Stuart.

MR. WATT: While it is true that we are most interested in obtaining injunctive relief in cases in which we're trying to enforce our patents, damages play an extremely important role in deterring infringers and their activities. And so it's important that we get the damage calculations right and we don't do anything to lessen or weaken that deterrent role of damages.

MS. MICHEL: Well, one thing's for sure -- Suzanne.

MS. SHEMA: I think it's been interesting to track the proposed solution to the damages issues in the IT industry. When I read the original proposal of damages should be or a reasonable royalty should be based on the specific contribution over the prior art, I looked at that and I said you mean the claim. That's what a claim is supposed to do, is it's supposed to be clear from reading a claim what the invention is. And then later there was another proposed solution of essential features, that a

reasonable royalty should be based on essential features.

And again I think that's the claim. It takes us back to Section 112, second paragraph, that if you're trying to solve that problem of what is the invention, solve it at the claim stage, don't wait until you've reached damages stage to try to apportion out what damages are.

So if it's not clear from the claim, if the applicant has not particularly pointed out and distinctly claimed what he regards to be his invention, as opposed to the system in which his invention operates, he has failed to satisfy 112, second paragraph.

I hope that the law continues to develop that way. There certainly is the opportunity for it because it's in the statute. The language is there now. We don't need to modify it. If we modify damages language, we may solve that problem about poorly-written IT claims, but we're going to wipe out a lot of good that's developed in other industries. So I'm encouraged that there are solutions that are in the statute for the problems that are being suffered by IT. There are solutions, those solutions aren't in apportionment of damages.

MS. MICHEL: Thank you. One thing's for sure, damages is a complicated topic. We'll spend about two hours

on it tomorrow afternoon. But I appreciate your input from the on-the-ground perspective on that issue.

I want to thank the panel very much.

We'll take about a 15-minute break now and come back and talk about the IT sector.

(Applause. Recess taken from 10:18 a.m. to 10:29 a.m.)

PANEL 2: THE IP MARKETPLACE IN THE IT INDUSTRY

MODERATORS:

SUZANNE MICHEL, FTC

ERIKA MEYERS, FTC

PANELISTS:

JOHN A. AMSTER, Co-CEO, RPX Corp.

TIMOTHY CREAN, Chief Intellectual Property Officer, SAP AG

RON EPSTEIN, CEO, IPotential, LLC

HORACIO E. GUTIERREZ, Corporate Vice President and Deputy General Counsel, Intellectual Property & Licensing Group, Microsoft Corp.

RICHARD J. (CHIP) LUTTON JR., Chief Patent Counsel, Apple Computer, Inc.

ALEX SOUSA, Counsel, Innovalight, Inc.

E. EARLE THOMPSON, Chief Intellectual Property Counsel, SanDisk Corp.

LEE VAN PELT, Van Pelt, Yi & James, LLP

P R O C E E D I N G S

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MS. MEYERS: We're ready to get started with our second panel, The IP Marketplace and the IT Industry. We'll explore similar issues as we did in our first panel but from a different perspective of companies in the information technology sector.

Our panelists, more or less in alphabetical order, are:

Tim Crean, who is the Chief Intellectual Property Officer of SAP;

Ron Epstein, who is CEO of IPotential;

Horacio Gutierrez, who is Corporate Vice President and Deputy General Counsel for Intellectual Property and Licensing Group at Microsoft;

Chip Lutton, who is Chief Patent Counsel at Apple;

Alex Sousa, who is Counsel at Innovalight;

Earle Thompson, who is Chief Intellectual Property Counsel at SanDisk;

Lee Van Pelt, who is a partner with Van Pelt, Yi and James;

And, finally, John Amster, just under the wire,

who is Co-CEO of RPX Corp.

So thank you all for joining us and let's get started.

MS. MICHEL: All right. So we're going to talk about the role of patents in the IT industry. We're going to devote two hours to a topic that could take a week and we'll see what we can do.

I want to start by giving each of the panelists three minutes or so to just introduce your company, how patents work for your company or your clients, because I think that's really central to why you've all generously given your time here today.

Why don't we start with Lee and we'll move around that way.

MR. VAN PELT: Yes. I'm a patent prosecutor and I represent some large companies, but I represent probably more sort of the classic Silicon Valley start-ups are probably the majority of our clients. And I think that's probably -- describing them is one of the reasons I'm here, and we see clients that need patents on the one hand in order to encourage investment and get investment from venture capitalists so they can argue that their technology just won't be copied, but, on the other hand, who view

patents as a risk factor as well. And it's very interesting to me since the last hearing with the reforms we've had how the balance has sort of changed between -- to a start-up: Are patents more of a positive issue or a negative issue? And that's really one of the things I'm interested in and would like to comment on today.

MS. MICHEL: Okay. Earle.

MR. THOMPSON: All right. I'm Earle Thompson with SanDisk Corporation. I will say, I'll do the normal oral disclaimer: The views and opinions are mine, not to be imputed to the corporation. That being said, I'll explain a little bit about how SanDisk operates, how it got started, and how patents are extremely important to SanDisk.

What SanDisk got started doing was trying to force a technology, in this case, EEPROMs into doing an unnatural act: We wanted to make mass storage units. And EEPROM was never designed to do that. And so we had to figure out how the system operated in that and also improve the memories.

As part of that, the company recognized that in order to take advantage or to really grow the market and to drive the prices down, to where new markets would open, it had to make this a commodity. And to do that it had to license. And so SanDisk has always had a model of licensing

its technology.

Now one of the things that you get into when you actually are in the commodity business is you realize at some point the barriers to enter are so low that if you do not have a way of still funding your R & D, the people who can enter it without having any R & D expense or anything else can under sell your price and drive you out of business. Consequently, licensing is still a major issue for SanDisk, and so royalties are very important to it because we continue to innovate in that area, we continue to pour hundreds of millions of dollars a year in R & D, but we continue to drive down the prices and open up new markets.

MS. MICHEL: All right. Thank you.

Alex.

MR. SOUSA: Okay. Thank you. Innovalight is a solar cell manufacturing company, so I guess you can say we provide the electrons for the IT industry. By combining precision inkjet printers with proprietary silicon nanoparticle inks, we intend to produce solar cells with both high efficiency and at a low cost.

We are in the process of launching what we think will be a revolutionary commercial,

clean-energy product, but until we do we're living on

somebody else's money. Right now we're literally 50 employees, a building, a few manufacturing and lab tools, and a patent and trade secret portfolio. So patents are pretty important to us right now.

MS. MICHEL: All right. Chip.

MR. LUTTON: Thank you, Susan and Erika and thanks to the FTC for continuing leadership in helping us address the health of the U.S. patent system.

At Apple we like to say that innovation is in our DNA. Founded just 33 years ago, Apple's played a definitive role in the creation of three information technology markets: The personal computer, the digital media market, and most recently a new class of full function mobile computing devices. In each market we rely most heavily on the power of new ideas to inspire a new generation of consumers for products that sometimes they themselves did not realize that they wanted before. That's the power of great ideas. Apple's truly a company whose strength and growth are nourished by continuous innovation.

A healthy and functioning patent system is critical to companies like Apple and the information technology industry. I listened to the last panel, I want to say unlike some of the life sciences companies that the

Commission's heard from in the past, information technology companies don't generally rely on a single patent to protect our business products. However, patents do allow us to quantify, capture, protect, and in some cases license the value of our innovations.

Patents are the currency of innovation that permit innovators to validate, exploit, deploy, and exchange their ideas in commerce, all with an idea -- an eye to contributing to the productivity of the economy. Thus we have a strong belief in the importance of the patent system.

Unfortunately, in the last decade or so, a new culture of patent abuse has arisen that's driven largely by the litigation process and the promise of recovery in a litigation context. It's fueled a bubble of investment that's far removed from the commonsense underpinnings of the patent system. I just wanted to just tell you something about Apple's current load.

As of our last 10Q, Apple has over 30 active patent infringement litigations against it, of which 13 were filed so far in 2009. This number's up from 13 in late 2007 and up from seven in late 2006. The overwhelming bulk of these cases are by entities that do not themselves practice the patent being asserted or, for that matter, offer any

product or service at all. And at any given time somewhere between a third and a half of those cases involve patents that were sold or offered for sale in the months preceding the lawsuit.

I'll save my comments about what to do about this and how to address it, but we see all sides of the patent system and we feel like the problem that we -- the way that we experience the patent system now does give rise to this duality, where on the one hand we have very strong uses for patents in our day-to-day business, do lots of IP-related transactions on a regular basis, and yet we're confronted with a litigation-driven reality that doesn't replicate or even match in any way the real world experience that we have with valuation and use of patents.

MS. MICHEL: Horacio.

MR. GUTIERREZ: So I work for Microsoft. Microsoft's the largest software company in the world. And we invest about $9 billion a year in research and development. It's one of the largest R & D budgets in the world. We are a company that essentially would not exist in the absence of intellectual property, not only patents but also copyright and trademarks and all kinds of intellectual property.

Like some of the other companies that have talked before, we see the IP system and world from both sides. On the one hand, we are one of the top patentees in the U.S. and around the world. We also get sued very frequently. And this is one area in which we're ahead of Apple: We have 55 pending cases against us. The number of active cases in which we're defending ourselves has essentially quadrupled over the last ten years. The large majority of those are cases brought by nonpracticing entities. A large majority of those are in the Eastern District of Texas. So that is clearly an area that we think a lot about and that causes us to incur significant costs.

We, on the other hand, you know have to invest a significant amount of money in procuring IP licenses from third parties. We not only develop our own patent portfolio, which recently we crossed the 10,000 U.S.-issued patent mark just a couple of months ago, but we also acquire patents in the secondary market and we also license-in patents from third parties as well as license out. We have since 2003 an active patent-licensing policy that unlike many other companies in other industries -- we actually will entertain and license on commercially-reasonable terms almost any patent that we have in our portfolio.

And so IP's very important for the survival of the company long term. And we believe we get to see the IP world from both at its best and at its worst.

MS. MICHEL: All right. Ron.

MR. EPSTEIN: Hi. My name's Ron Epstein. I'm the CEO of IPotential. IPotential is an intellectual property broker. What we did is we started IPotential the beginning of 2004 in order to provide the vast majority patent owners access to the same level of expertise in understanding how to undertake patent transactions, be they licenses or sales, that has been traditionally the exclusive province of large companies like Microsoft and Apple and IBM.

So I'm a former head of licensing of Intel Corporation. My co-founder was one of the leaders of the Boeing licensing organization. We have leaders from Siemens' networking business and from law firms. And our objective is to assist both on the buy side, otherwise known as buyers or licensees or, in the parlance of Eastern Texas, "targets," and the sell side, which is the patent owners, be they large corporations or small undertakings -- or individual inventors -- in undertaking patent transactions.

So we've, in essence, worked over the last five years to be one of the market makers that has created this

growing marketplace of patents, not just on the assertion side but to create this new way of monetizing patents, which is in the purchase and sale of those patents in an open marketplace.

We've closed over 135 transactions worth $270 million. So when I left Intel in 2001, patent sales were, I think, considered anathema or unforgivable sin for large corporations. Today we have sold patents for some of the very largest corporations in America and to some of the various -- including I think yours -- in the past.

So I guess I'm going to speak a little bit less about the assertion side and a little bit more about the secondary marketplace.

MS. MICHEL: Tim.

MR. CREAN: Thanks, Suzanne, Erika, and the FTC, for holding these hearings on the evolving IP marketplace and giving SAP the opportunity to participate on this panel.

SAP believes in the patent system that balances the need to create incentives to invest in innovation with the need to promote competition on the merits. Because of this perspective, SAP believes that the FTC can play an important role in helping the intellectual property community and the competition law, competition policy

community come together to agree upon policies, legislation, rules which can help the patent system fully reach the constitutional goal of promoting the progress of the useful arts.

Now SAP is the world's leading provider of business software, such as ERP, offering applications and services that enable companies of all sizes and more than 25 industries to run their businesses more efficiently and more effectively. The company has more than 86,000 customers in over 120 countries and invests billions of dollars each year in research and engineering.

Now SAP's success is due in large part to our ability to innovate. And because SAP continues to consistently bring new innovations to the market, we look to the patent system to play a vital role in protecting those innovations. However, certain preconditions must exist before the patent system in general and the evolving IP marketplace in particular can work together to help fulfill the Constitution's promise.

First, we believe that patents granted by the PTO must be of high quality. Second, the boundaries marking the limits of the intellectual property protection embodied in those patents must be sufficiently clear so as to give due

notice to the public of the property protected.

Third, the damages methodology used to value the issued patents must be clear and consistently lead to valuations which neither over compensate nor under compensate the patentee.

Now over the past several years, however, on the occasions when patents of low quality have issued with vague and amorphous patent claim and claim boundaries, especially when coupled with an approach to damage calculations that can be baffling to lay jurors, this has led to some damage awards untethered to actual harm.

So it is only after we adequately address these issues that the IP marketplace in the IT industry and the patent system itself can fully reach the constitutional goal of promoting progress of the useful arts.

So I'd like to thank you again for inviting SAP to these hearings and I look forward to discussing these topics with you.

MS. MICHEL: Great. Thank you.

John.

MR. AMSTER: We'd like to thank you as well for inviting us to participate in the panel. I'm Co-CEO of RPX Corporation. RPX is the first independently-funded

defensive patent aggregater. And we view our goal as very simply to buy as many patents as we possibly can that would otherwise be asserted against the companies who are our customers. Our customers pay us an annual subscription fee and get a license to every single thing that we buy.

Our fee is capped out at $4.9 million a year for the largest companies in the world. And it's a scalable model where we have a price that goes down for a start-up company would be $35,000 a year.

We will never assert patents and we do that because we think it's very important to have a pure model in this space which is solely focused on defensive buying and not focused on what one would consider to be traditional patent licensing. The best proof of that in our model is the fact that year in and year out we will charge the same rate, despite the fact that we will be buying $100 million and up a year worth of patents and still charging the same amount of money.

The goal of what we're doing is taking what I would call a business model approach to the problem that Chip and Horacio and Tim have mentioned, which is the increasing NPE problem, which is a hundred percent of what we are focused on. And our approach to this is to be able

to provide an aggregated pool of capital that we have from outside investors and from our customers in order to be a very active participant, again purely on the defense side, in the secondary market, to provide liquidity to inventors so that they have a viable outlet for monetizing their patents other than filing lawsuits in the Eastern District of Texas and in other jurisdictions throughout the country.

And that's it.

MS. MICHEL: All right. Thank you.

I'd like to start by talking about technology transfer, and not just buying and selling patents. And when a manufacturing company, a larger company, wants to bring new technology in in order to commercialize it, how is that often done in this sector? Through licensing, through acquisition? Why choose one or the other when you go which way?

I'd like to hear from both companies that bring in technology and then others that might be the ones importing the technology -- or exporting it. Any comments on that?

MR. GUTIERREZ: I'm happy to start.

MS. MICHEL: Thank you.

MR. GUTIERREZ: I think there isn't a reliance exclusively on one method or the other. We do both, in

reality. And I think if you ask me which one is the most common approach, I would say for the most part, depends on what metric you look like to determine which one's more common, but the reality is that when there is a technology that we think is very promising and we think it's a technology that we would benefit from incorporating into our own products, we would look at acquiring the company if we're talking about a small type of company.

And there are a number of reasons for that, but one of them is you're trying to acquire not only the patents or the IP that you have, you're trying to bring in the people who developed the technology, who know the technology best, and who can help you really explore the ways in which it should or could be integrated into your products. But it really depends on the kind of technology you're talking about.

If you're talking about technologies that are, you know, IP rights on commodity technologies or standards based, or others where there isn't really a differentiating value in bringing it, what you're trying to do is enabling your products to work with a certain kind of commodity or standards or broader-licensed technology, then you won't have the option to bring the operation in and the people.

You will then rely on licenses.

And so the answer depends on the kind of technology and the situation. I think in general we would tend to want to acquire the company and bring in the people.

MR. LUTTON: I would -- oh, I didn't flip the tent.

MS. MICHEL: Oh, I should say, yeah, we'll do the tent system. If panelists would like to turn up their tents, then we'll --

MR. SOUSA: We can all talk at the same time.

MS. MICHEL: -- we'll go around and I'll call on you.

Okay. Chip, please.

MR. LUTTON: Okay. And so I would just quickly say I agree that there is a variety of tools used, including acquisition, licensing, investment in external R & D.

In the case of acquisition you're almost always interested in acquiring personnel as well as knowhow. In the case of licensing, by far the most common would be in combination with knowhow, licensing. I think probably the least common would be just a pure -- again, prospectively looking at new technology that isn't implemented, the least common may be just a patent right alone.

And how you decide which of these you would choose depends on a number of factors, including the degree of control that you want to exert, but also the direction that you want to go with the technology. How much do you want to reshape it and how much are you looking to change it, maybe retain the basic underpinnings but then reshape it. And if that is to a very high degree, then an acquisition's the more appropriate vehicle to be able to exercise that control.

MS. MICHEL: When you're looking at an acquisition how important is the patent position of the start-up that you're acquiring?

MR. LUTTON: It's important. It's important because it demonstrates the bona fides of the technology. It's important because it represents the opportunity to determine the future course of that technology beyond just what's inherent in trade secret and knowhow protection. So it is important. And how important kind of depends on exactly what you intend for the technology, but it certainly is a valuable metric and important part of the source of the value.

MS. MICHEL: Horacio, you also talked about acquiring companies. The same question: How important is

the patent position of the company that you're acquiring?

MR. GUTIERREZ: Well, again, one should not generalize, but I would say as a general rule that is one of the things that we look to. And I would agree with Chip, it kind of establishes the bona fides of the company as a target for acquisition. And especially in those situations in which you're looking to that technology you're bringing in as a differentiating element that you're going to use to compete later on in the marketplace.

MS. MICHEL: Okay. I'll go to Tim next since he represents another company that might do the acquiring, and then we'll go to the people who might want to be acquired or license out.

Tim.

MR. CREAN: I'll make my point quickly. I just wanted to pick on Chip's point about the variety of legal tools. And I think about it as a continuum of legal tools from acquisition to OEMing, reselling, and joint development, community development, standard-setting organizations, open source, buying all patent rights; and it gives the company and the legal team a rich set of tools to pull from, depending on the conditions in the marketplace that are driving the acquisition.

In some ways you can think about it as a continuum from if the technology is core to your company's product, you're going to be on the acquisition end of the spectrum. You're going to build it or buy it yourself. And if it's less core, you're going to be on the standards and open source end of the continuum. You get to pull from this rich set of tools.

MS. MICHEL: All right. Lee.

MR. VAN PELT: Well, it's my experience companies are acquired for a number of reasons. They're acquired for their engineers, in many cases. They're acquired for the customers they've been able to capture and they're acquired for their technology.

An example of a company I think was acquired for the customers it had is YouTube. I don't think Google learned a lot technically from YouTube, and I don't know, but I imagine one of the first things they did when they acquired the company was to fix the sort of baling wire and chewing gum together system they had to deliver video, probably, and made it the first class thing you'd expect Google to be able to have.

On the other hand, companies are acquired for their engineers, sort of at the life-end of their cycle

where they have not really succeeded, are acquired for a lower amount of money that probably wouldn't be enough, if that was what was thought was going to be the company would yield at the beginning of the processes, would not have attracted investment.

I think where patents come into greatest importance is when the company is going to be acquired for its technology and for its engineers. And what the patents do is they support the point to where the value of the company isn't just: We hire all the people, or: We figure out how to copy the technology, which often doesn't take that long.

What patents do for a start-up is support the fact that the company is going to sort of be the whole package: The engineers and the technology. They own the technology. In order to get the whole package you've got to acquire the company for a higher price, a price that really prospectively would have encouraged the investment in the company, to begin with.

And I think that's what patents really are -- you know, patents divorced from real advance in technology. I think they're a drain on the system. It's a parasitic thing. But patents combined with a good technology that's

developed are what really enable a start-up to be acquired for a price that is going to be enough to encourage more start-ups to be funded and to start. And that's really, I think, the most important thing about what I do, is the encouragement of the flow of capital from people that have money to people that have brains. Because that's something happens better in Silicon Valley than anywhere in the world. And I think that's the most important thing we want to preserve with our patent system.

MS. MICHEL: Alex, then Earle.

MR. SOUSA: I think that all other things being equal, it probably depends how big you are or, more appropriately, how much money you have. From the perspective of a start-up, you know, you generally don't have the money to acquire short of a fire sale. And particularly early-on licensing is usually a better low-cost option. If you take the time to look in a pile you'd probably find a couple ponies that you could have for a reasonable price.

You know many universities, for instance, will give you an exclusive option on a license for just a few thousand dollars. And these licenses, in turn, can be used to raise money. So from our perspective, from a start-up

perspective, licensing and, more particularly, the options on licensing are a real, low-cost effective way of getting technology. And if you decide you need the technology later on, then you can invest the money or pay the fees or purchase it outright, you know, when you have the money to do that.

MS. MICHEL: Earle.

MR. THOMPSON: Well, not all acquisitions of course are with start-up companies. I mean, you know, we have bought some companies that, well, basically were about as old as we were and in the same market space. And there you may be acquiring engineering. You may be acquiring some customers. You may be doing that as an expansion of your own management strengths, because you may find that the other company has certain skill sets that you don't have. Again, that being said, I've never acquired a company where the patents were not a key element in acquiring a company.

We do -- on the other hand, when we license out, there's only two ways in which we do it. It's either a bare naked patent license or we engage with a joint venture of the company, in which case there's actually a technology exchange that goes on when you're jointly doing something. You know, that may be a little different in other industries

where you have to transfer technology as well as license a patent. Usually at least in the semiconductor and product business that we're in, we don't find it necessary in most cases to provide the technology, just the bare licenses are sufficient.

MS. MICHEL: Is one of the reasons for that that you work in an industry that's very standardized?

MR. THOMPSON: It really doesn't have to do so much with standardization, but if you look at who -- for example, our competitors would be in the semiconductor space, they're usually many times our size. I mean I'm competing with the Toshibas and the Samsungs and the Hynixes of the world and they already have a massive amount of technology themselves. And so it's not necessary for me to transfer more than what the patents teach us in many cases.

MS. MICHEL: Okay. Ron.

MR. EPSTEIN: Well, I'm actually going to build a little bit on what Earle says. There's an additional way of obtaining technology transfer in the tech industry and I think the simplest label would be competitive intelligence, and that is looking at what other features other people in the marketplace have and deciding to put those features in your products. I think that's a time-honored tradition.

The simplest example would be the iPhone was incredibly innovative in bringing a complete touchscreen interface. And I think within months you started to see the other cellphone companies start to copy that innovation in an attempt to stay even in the marketplace.

Given that many technologies, once the idea is out there, it's a relatively trivial engineering effort to copy that. You know, patents obviously play a role, particularly, I think Chip mentioned this in his opening remarks, for highly-innovative companies to make sure that they capture the scope of the innovation, particularly what we like at IPotential refer to as a eureka technology. Once you've heard of it, it's relatively easy to copy it, as well as ingredient technologies like what Earle's company does. Once you understand how to make flash memory, it's relatively easy to do that again and again.

MS. MICHEL: John.

MR. AMSTER: I wanted to just make a quick comment on the value of patents in M & A transactions because while I think it's true that my background is primarily in M & A. More M & A than it is IP. While it is true that there is a lot of attention paid to patents, there's not a lot of value placed on them, in general.

And one of the things that the secondary market has brought to M & A transactions is that there is an ability to value patents separate from the actual M & A transaction. I think we're seeing a lot more evidence of that. As an example, when I resold Intertrust Technologies, Intertrust was sold not for its engineers, not for its ability to create standards around digital rights management, it was sold for patents. But we ran a process to try to sell both and what we determined was that the best way to sell the company was to sell the patents without the software, without the engineers, without all of the burdens that went with the normal business.

After that I started an M & A practice for Ocean Tomo and the basic idea was working with small companies when you're looking at your strategic alternatives to hire an advisor who actually understood how to do the patent piece of the transaction. And what resulted, we did six engagements and in all but one of the engagements there was a separate transaction of somehow transferring some rights and the patents separate from the rest of the business in order to generate more value.

The best example of that was Commerce One, which in bankruptcy was about to be sold for four and a half

million dollars, the whole company. And when we got involved, we were able to sell the patents for fifteen and a half million dollars, and still sell the company for four and a half million dollars.

Very recently, and again, it's the development of the secondary market for patents that's enabling this. Just recently SGI went into bankruptcy with a $25 million cash offer to buy the company and all of the core patents. As a result of the active secondary market, the ability to promote and potentially sell the patents separate, the deal that ended up getting done was more cash, fewer patents going to the ultimate buyer. So that what I think we're seeing is that while value, while it's important strategically on the patents, historically there hasn't been a way of valuing it. The secondary market enables that to happen, which I think is beneficial for shareholders and companies.

MS. MICHEL: Does this concept of valuing patents, moving back to the context of the patent being transferred for the purpose of whosever acquiring the patent to actually engage in a new technology that the acquirer has not participated in before, trying to do something new, how do you value the patent in that situation as opposed to a

secondary market? How much do you have to look up, for instance, what other patents are out there and is that a problem?

From either the acquiring perspective or from the start-up trying to transfer its technology perspective. Lee, is a start-up worried about what other patents are out there that might be blocking its technology?

MR. VAN PELT: Well, start-ups worry about that to some extent, but, in general, a start-up is not going to be sued by larger companies or by patent trolls because, you know, patent -- the reason they sue larger companies is the same reason people rob banks, because that's where the money is. It's not in a start-up. So it's not a significant risk.

What is more of a risk for a start-up is a competitor will have a patent or will buy a patent that is one of these sort of low-quality patents, which tend to get sold, but the claim sort of -- I call it an ink blot claim. You can look at the claim and different people can see kind of what they want to see. And then once you have that, the issue of one million or two million dollars to get out of -- you know, even if you get out of litigation very early, kind of can be a very large sum of money for a start-up. So I

think that's where the risk comes in, is to where there's this sort of low-quality patent out there that costs a lot of money to get rid of.

MS. MICHEL: Okay. We'll come back to the ink blot claim problem in a little bit. I think it's an important topic today.

Is the potential -- trying to understand the value associated with the patents when the technology is transferred from the start-up to the manufacturing company, do these issues come into play in trying to assess that value, that the likelihood that someone else might come and sue on the technology later, or is it just not part of the discussion?

Horacio.

MR. GUTIERREZ: Absolutely that comes into discussion. That's one of the things you think about. And just valuing IP is one of the most complicated, imperfect things that I've ever seen. When I started working in this area I had this vision of there being a very scientific process of looking at a patent and being able to determine what was the inherent worth of that patent. I've learned that, in fact, the process is a lot more subjective than many people would think.

And fundamentally the question that people ask is, you know, how badly do you want it and how much can you afford it and what other players are there? So it's really more of a market dynamic. And the more there's demand and less supply -- well, supply's fixed in that particular case of that patent, although you could even argue that the way that the claims are written, you know, there are a number of patents that are almost fungible.

But when you started the initial set of questions you were talking about the technology transfer.

MS. MICHEL: Right.

MR. GUTIERREZ: I think a number of us talked about patents in the context of a transaction in which you were trying to get not only the patent rights but actually technology associated with it. And there were some comments that would point to the notion that a patent in the absence of technology or people is worthless.

And I just want to point out from our perspective, in real life, I think that's a little bit of an exaggeration. If you look at it from a static perspective and you're looking at it from the line-up of products that you have today, if you feel that you've reached a certain critical mass in terms of the patent protection of the key

features, you could say the value of the -- the marginal value of the incremental patent is questionable or is relatively low. If you're a large company who wants to enter new businesses, and sometimes you enter new lines of businesses in which you're frequently bumping against established patent portfolios of other incumbents, then the patents themselves have intrinsic value. What it is, it's hard to determine and it's really up to you and how much you're planning on investing in the area, but when you're entering into a new area and you feel that you're exposed, one of the tools that companies will use is the acquisition of patent portfolios in the market.

And in those cases acquiring the patents alone would have value. It's a little bit of a build versus buy type of approach, the same that you would use in: Do I develop this software myself or do I get the software in from somebody else? I think in the patent area there's a little bit of that analysis that happens too.

MS. MICHEL: I knew this would be a talkative group. As part of that what we'd like to understand a little bit is how much the patents are encouraging the innovation Horacio talked about going into a new area, for instance, and wanting to get patents to cover that, so that

there's the issue for a larger company. And then there's the issue for maybe a start-up of needing the patents to attract funding.

So if you could talk about the role of the patents in developing the new technology initially.

Alex.

MR. SOUSA: For us, my company was originally a lighting company and we have switched over to solar, which is sort of like lighting in reverse, if you think about it. And we did -- well, it kind of is, right. We did a lot of due diligence, a lot of research, because we actually make a raw material. We make a particle, a silicon nanoparticle. We put it in an ink. So we're sort of a vertically-integrated company and we did a lot of due diligence: Ways of making particles, ways of creating these dispersions.

In many ways my company is kind of a like a biotech company because we use organic chemistry and things. And patents were very important to us because investors, before they hand you a check, they want some protection. You know: What are you guys going -- what kind of boundaries are you going to have, what kind of barriers do you have. So we acquired some patents.

A patent has technical value, but a patent could

also have marketing value. We acquired one or two famous patents in our area. Everybody knew about them, right. So people got: Oh, you got a license to this very famous patent. Wow, that's really great.

And the reality of it, in terms of for investors, investors have no idea what a patent is. They think that two patents are better than one patent and ten patents are better than one patent. And they have this numerical concept of patents. Oh, you got 30 patents, you're doing great. That's a famous patent with a pretty picture. Even better, right. And it makes them feel warm. You know, they feel more generous and then you can get the money.

This is the reality of it. Very few investors, unless they themselves are patent attorneys or engineers, understand what actually is a patent portfolio. All right. So a patent could have marketing value that's worth paying for, but there's also technical value. And we wanted to get patents that had technical value for us, because in my space, the nanotechnology space, the field was getting crowded. So we wanted to have at least an island, a breather, some ability to develop without being sued or have a chance of success.

We have progressed, we have matured. We went from

licensing a lot of technology in, to organically creating a lot of our technology. And those patents that were very valuable for getting us funding and giving us protection now have sort of yellowed a bit and we don't need them anymore. So I've become quite the expert at de-licensing. You know we got the licenses in, now my job is to try to get the licenses out because we don't need them anymore.

And one thing about licenses that are very -- people kind of forget is that when you're not making money, they're great, you can get them cheap. But licenses are like a tax, right, when you're making money you've got to be paying two, three percent off the top to some of these people if you get a real key license, so you have to be kind of careful for it.

But to get back to the point, is licenses -- patents in particular were very important to us because it directed the areas we were going to focus on, and we were going to build a company. So I don't know if that answers the question.

MS. MICHEL: Very helpful. Thank you.

Lee, I don't mean to put you on the spot, but from your perspective IT companies, start-ups in that space, do they need the patents to attract the venture capital?

MR. VAN PELT: It really depends on the business plan. I mean if the business plan is to acquire a large number of customers, if it's sort of either the Hotmail business plan or the YouTube business plan, I think patents are largely irrelevant. But if what it is -- if the company is more to try to develop a technology, if I were trying to start a company to improve on a browser, for example, not to bring up a highly-charged example, but really the marketplace is so controlled by other companies that you're really going to need to have intellectual property in order to motivate the company to acquire you, because you're not going to win in the marketplace most likely. And so if that business plan is helped by having intellectual property, by patents.

And really I think Alex made some excellent points as to the imperfection of how information flows to investors and so forth, because it really is sort of this -- I think at the end of the day, it's a vague notion of this company is more valuable because of the patents, or that because there's a lot of uncertainty and probability that comes into it, will ultimately this cause -- when we cash out this company, will it be worth more or worth less.

And I've seen at the point of acquisition to where

there was an assertion against the start-up and the acquirer looked at that as a big risk factor that drove the value down a lot. And I've certainly seen the issue that comes up in acquisitions where if the price isn't agreed upon, the larger the acquirer says: Well, we'll just adopt the technology without acquiring you, and there the patents are important to make sure that they -- you know, that the start-up -- or the company being acquired has some power. So they can be pro-competitive if they're sort of in a balance of things, or they can cause problems. And I think really the answer is better-quality patents are good and lower-quality patents just cause noise and friction in the system.

MS. MICHEL: John, then Ron.

MR. AMSTER: So I would say in general that I think what Lee said is right. Depending on the technology area when it comes to raising money that venture capital firms and angels are very -- have historically been very focused on patents.

My experience is that they have been focused not in a very educated way. And what I mean by that is they get very confused between defensive value and freedom to operate.

I always found it amusing -- and they have been getting better, and I say this having spent a lot of time in the last year talking to venture capital firms and now receive phone calls on a very regular basis with people assessing patents in kind of the right way.

But historically what they would say is: Do your patents cover what you've developed. And that goes to what Chip had said before about the bona fides of the technology. Is this patentable. You know, is this a step forward in some way.

If you think about it from an investment standpoint they should be focused on what patents do you have that read on the competitors who are going to sue you when you're coming in the marketplace, and they historically have not focused on that very much.

I think that they are starting to understand that, which is why you are seeing more and more venture capital firms almost encourage their portfolio companies to sell their first sets of patent portfolios. In other words: This is what we had when we walked in and raised our first round of financing; we've got the freedom to operate under these features that we were able to patent; we are now going to sell those as a means of financing the company and we are

going to focus now on the future development of our portfolio, on things that are actually defensive, which were the things that really add value.

And I think you see the same thing in M & A transactions, which is very rarely do you see somebody willing to pay more money to get a company -- you see it, but very rarely, -- where they pay more money to get a company where they own the patents, they're usually just as happy, if they're buying a company for the technology, just as happy to have a very strong license to that than to actually own the patents with the acquisition, for the most part.

MS. MICHEL: Ron.

MR. EPSTEIN: Wow. John, thank you for taking my answer. I was going to echo, that we work with a lot of venture capital firms as well, but I would add one piece, and I don't know whether this is part of your discussion or not, but your question left out the role of the individual inventor, be they university professor or dean of the industry or icon of the industry.

I remember very early at IPotential getting a phone call from a guy named Bob. He claimed to be the inventor of the DRAM. And I didn't really believe him till

I looked him up on Wikipedia, and sure enough it was Bob Probstein, who was one of the key inventors of DRAM, looking to sell his patents that he had developed separate from his earlier corporate allegiances.

So there are individual contributors out there. There are individuals who do contribute to the weight of innovation that ultimately gets adopted in the marketplace. To say that you must, in addition to being an innovator, also have expertise at attracting capital and operational experience in order to be deemed worthy of receiving compensation for that invention seems a bit of a stretch.

MS. MICHEL: Chip.

MR. LUTTON: In both the context of technology transfer and in the context of a start-up, the value and necessity of having patents is, as I think a number of panelists have said, very difficult to define objectively and have just one answer to. And one reason for that I think is, again, as others have alluded to basically, the very subjective -- it's a very subjective issue.

The patent value and its necessity to an enterprise is judged really in relation to the business options that it creates for that enterprise in the context of their other business commitments and model. So a patent

that may directly cover a competitor is -- doesn't have the same value in the hands of an enterprise that has no willingness for whatever reason to assert it in that way. A patent may be extremely valuable for licensing but have very little value to a company that is not willing to license their technology.

So the context and the business option, one way to look at a patent, sort of it secures the option to have a certain business model if that fits with the rest of what the enterprise is doing, which sets up the possibility that a patent is worth a whole lot more to one company than it is to another depending on what that company may be willing to do with the patents or what stage it's at.

And so I think in the acquisition context one way to look at that is you set the value, you evaluate the value of a patent portfolio based on what you're willing to do with the patents once you acquire them.

For a start-up one way to think about patents is whether or not a start-up intends to do anything specific by way of asserting patents or licensing. You want to acquire patents because it preserves for a later-acquiring entity options that they may want to exploit.

So I think one way to look at the patents

therefore in all of these contexts is they preserve options. They're sort of a notch on a ratchet that helps you secure and validate the extent of your contribution and then when business needs change, you've got that locked in. So I think that's part of the answer.

MS. MICHEL: Okay. Earle.

MR. THOMPSON: Actually to a very large extent I agree with Chip on there, because the one thing I was going to disagree with John about, from the standpoint that to me just having a license, from an acquiring company, to merely have a license to a technology and they've sold the patents, would be a major problem. And the reason for that is, you know, I'm one company that depends on, because I'm in the commodity business, depends on my licensing income in order to fund my R & D. I don't have a licensing income if I've sold my patents.

Yes, I may have a freedom-to-operate in an area, and indeed I acquired some patents for that or have a license in the freedom of operation. But I'm one company, you know, like Chip was talking about, where it has value to me and it does preserve my options.

MR. AMSTER: Yeah. And, just real quick, I guess what I'm really saying is in my experience, even in

companies with commodity businesses where they clearly do value it, they value it. In other words, you can say to them: Well, okay, great, but what are you -- these guys are willing to pay. You know, you're willing to buy the company for $20 million, I've got somebody willing to buy the patents and give you a license, but they're willing to pay me 20 million, so I can get 40 million. What are you willing to pay me for just the technology with the patent license?

In most situations -- again most -- there is a price. You're not willing to pay 20 million anymore, but the point is there value creation to be had by looking at -- the way different people look at it, there's value creation to be had.

MR. THOMPSON: I'm not going to argue. I'm just saying I'd be the one willing to pay 40,-.

MR. AMSTER: Right. Exactly.

MS. MICHEL: Alex.

MR. SOUSA: Yeah. You know, I tell the folks in my company this, that patents are in some ways kind of like insurance, right, you can use them to manage your risk. And they keep telling me: Alex, let's acquire this, acquire that. So-and-so's going out of business, let's get this,

get that. But they don't see the money part of it. See, insurance isn't free. You have to pay for it.

And if you try to eliminate your risk you will go bankrupt. It's impossible. The best you can do is minimize it and manage it. So I try to convey the sense of, you know, think of it as insurance and what is the expected value or the chance of being sued, you know, or if we possibly go into a certain area maybe in the future and try to get some economic analysis. Because if you don't have a lot of money, if you're a start-up, you know, you can only make so many bets at the casino table, right, and you got to make the bets wisely. And there are some things that maybe you need to acquire, but these things have cost.

And you need to think of it in terms of cost benefit and say, you know, maybe there's a five-percent chance somebody somewhere will sue us in this one area if we go into this market and maybe we'll just live with that because on balance that's a cheaper option than trying to acquire the technology just to eliminate that risk all together.

MS. MICHEL: So John's talked about a mostly defensive view of these patents. Is that the experience of others? And to the extent that you need to build a large

portfolio -- do you feel that you need to build a large portfolio to be able to operate defensively in that way? Do the numbers matter and why do they matter? Any comments on that?

Horacio.

MR. GUTIERREZ: They absolutely matter, from a defensive perspective. Now that's not the only reason why you get patents. The defensive perspective is just one side of the ledger. And we haven't talked about the other side, which for some of us is equally, perhaps if not more, strategically important in the long term. But from a defensive perspective having a portfolio that has heft and it's perceived to have critical mass is really important.

And the reason it is important is you want to know and you want others to know that to the extent that they want to target you, you have the ability to respond. Having said that, that model is challenged in a world in which an increasing number of the litigation is coming from companies that don't have a product and therefore there isn't a symmetrical relationship in terms of the exposure that companies have.

If Chip and I were to litigate against each other, which we haven't done recently and hopefully we won't do any

time soon, we know that we both have exposure because we both have a significant patent portfolio and therefore the decision to move against a company will be colored by the exposure for your own product lines and their patent portfolio. When you're litigating against someone who has no product and there's an asymmetry in there that makes the heft of a patent portfolio less relevant, so that is also not the only -- defensive is not the only perspective, but is one that these days we think a lot about because so much of our litigation burden comes from companies that don't have the same exposure to your portfolio as you have to their patents.

MS. MICHEL: You said defensive was one side of the ledger. What's the other side?

MR. GUTIERREZ: I would say the most important perspective from the long term is your ability to protect your own innovations. All the companies around here are investing significant amounts of money on developing products. Those of us who are in the software industry, particularly here who do mostly software understand how low the barrier to entry in that market is. And we also understand that if your software -- if all of your software platform becomes a commodity, then in the long term you're

really going to be competing against people who have the ability to manufacture appliances using your software with a cost structure that you're not going to be able to compete with.

So in the long run, particularly you put it in the context of the globalization of markets and competition, in the long run having the ability to protect your investments and continue to differentiate the features and functionality that your product offers is the difference between having a viable software business or not.

MS. MICHEL: So you're talking about using patents in the classic patent theory sense of: I have an exclusive right then for this innovation?

MR. GUTIERREZ: Yes.

MS. MICHEL: How much do the other companies use their patents in that way? How is that important to you?

MR. CREAN: We haven't seen a lot of exclusive licensing, you know, sue to obtain an injunction in the software industry at this point in time. We've seen more cross-licensing, freedom-to-operate kind of behavior. But I agree philosophically with everything that Horacio said.

MR. GUTIERREZ: Just to be clear, in the history of Microsoft as a company we've sued three times. So it's

not like, you know, we're out there aggressively and broadly litigating. But it is an option and it is one of the reasons why you build a patent portfolio, is because there are going to be situations in which you want to know that you're going to be able to protect your investments.

MS. MICHEL: Earle.

MR. THOMPSON: Yeah, one way of protecting a commodity is to be able to exclude people, which is what you're -- the other way is to try to get a return via a license royalty, which is the model that we have followed over the years. That becomes increasingly difficult at times. You know, and I've been in the commodity business before.

My prior history was with Texas Instruments and I went through the DRAM wars, where again it became a commodity. You had entrants coming into there that had not spent the R & D. The barriers to entry were low and basically were driving you out of business, at which point the only way you could stay in business was, again, to get a license royalty. You know, that's a very similar model basically to where I am today and it's another way of doing it. It's somewhat more difficult at times. There comes a point where you go: Well, should I really just exclude

people?

And in our case we've chosen not to do that because that has enabled a lot of products. It's enabled iPods, the solid state disks that you see today, the flashcards, things like that totally replacing film. So there is another way of doing it.

MS. MICHEL: So if heft is important in the patent portfolio, what drives the decision to develop those patents internally versus going out and buying those patents on perhaps a secondary market? Is it more common to go out and buy those patents?

Ron.

MR. EPSTEIN: Yeah. So counter to the heft argument is the scalpel argument. I think when I started in licensing a long time ago, the way you would negotiate a license agreement is you would bring your stack and you'd bring a ruler, and you'd put each stack next to each other and you'd take a ruler and you measure the relative heights of the stack. And some algorithm would tell you the number.

When we were at Intel we gave up on that algorithm pretty early on. We said: Prove it. And I think, you know, I don't care how many patents you have, you can have 50,000 of them, show me one I ought to care about.

As a consequence I think the licensing marketplace has moved very strongly in the direction of what we call fact-based licensing, what we called fact-based licensing in my Intel days, which is demonstrating actual use. As a consequence, there has been an increasing value in capturing patents that have demonstrated value, that is, there are issued claims that you can show actually are infringed by folks. And there's a very simple rule in patent prosecution which is that you only obtain patents where you spend R & D dollars, right. I would assume that's a fair summary.

The people who might have patents that read on you don't necessarily have to compete with you. That is, we've been focusing an awful lot on NPEs, but I'd still say 70 percent of the defensive licensing we do is corporate-to-corporate licensing negotiations. And it's not always true the company has a good defensive portfolio. So there's been a change in the marketplace here, where Broadcom is a perfect example of this.

Broadcom had a big victory last week. I'm not sure about this, but I'd say almost all of those patents were purchased, right, for strategic reasons. So obtaining a patent portfolio today for chief IP counsel, and I don't want to speak on behalf of people who were here who were

chief IP counsel, but I've chatted with most of these folks before, you're required now to have a strategic portfolio.

You have patents that actually are lined up with meaningful business objectives. And where you look in your own patent portfolio and you find you have patents that are unrelated to those business objectives, those are surplus inventory and free to be monetized through sale; and, for where you have holes, then the right answer is to purchase those patents. And today at IPotential we talk to over 300 companies, all actively buying patents to fill holes.

MS. MICHEL: You said required now to have a strategic patent portfolio. Does that suggest that the situations change, that the strategies have changed over time?

MR. EPSTEIN: Absolutely.

MS. MICHEL: What's that timeframe and why do you think they've changed?

MR. EPSTEIN: Well, I think -- I left Intel in 2001 and I think there was still a weight-of-numbers theory. Today I think there's a pretty good consensus that it's a prove-it kind of environment, and a lot of that has to do with I think the increasing sophistication of the marketplace.

When I started in patent licensing there were few people doing patent licensing, very few people. Some of the innovators I can see here in this room. But today I think that a lot more people understand that patents have value. It's a market that's increasingly liquified over the last 20 years and, as a consequence, easier strategies are going -- you know, removing away from the easier strategy and more to the more sophisticated licensing negotiations.

MS. MICHEL: Tim.

MR. CREAN: So patent acquisition in a secondary market needs to be part of the IP portfolio plan and strategy, so I agree with Ron. One challenge to acquiring some assets in the open market is that some of the licensors, some of the sellers value those assets at a litigation level. And so if your plan is not to go out and license and litigate or have an offensive licensing program, it at times can be challenging to justify the purchase price that is currently in the marketplace.

MS. MICHEL: So you're suggesting that the value of the patent to someone who wants to litigate it is much greater than the value of the patent to a company that wants to use it defensively?

MR. CREAN: Yes, if you're just going to put it in

your portfolio.

MS. MICHEL: Okay. Chip.

MR. LUTTON: I want to make sure we get into what Tim's talking about, because I actually think the valuation in the secondary market, and the distortion in that market of the damages issue in particular in litigation, is one of the key things that we need to make sure we address.

But, on your basic question, portfolios grow organically. And these days they grow inorganically, and that's a good thing, to be able to align the portfolio with business needs. And the emergence of an efficient marketplace for being able to acquire additional assets or sell assets is a very positive thing, in the long run, and something that we ought to be encouraging and I think be pleased about.

But I do want to caveat it with making sure we come back to: What exactly is going on in that marketplace today and are those values being driven by these sets of values that we talk about, where patents are being used to promote some commercial or innovative enterprise as opposed to are the values being driven by the promise of overblown damages claims from a litigation system that doesn't provide adequate certainty and, in fact, creates a lottery style

possibility of recovery far, far in excess of what a patent would be worth in the real world.

So I'll keep distinguishing between kind of the real world where patents, I think, are used a lot, and more of a fictional world where the litigation system can give rise to uncertainties or theories that many times multiply the value of a patent in any commercial enterprise, so.

MS. MICHEL: Before going next to your second point, you've said that it is a good thing to have this market be developing. Why?

MR. LUTTON: Well, I think it is because, well, for one thing, if you have a long track record of R & D investment, you develop a portfolio that develops over a long period of time and especially in a fast-moving industry like the information technology industry, patents take a long time to acquire. Sometimes by the time you get the patent it's not that relevant anymore. Sometimes your products have moved on to something very different and the availability of your own patents in that space is several years down the road, and so to be able to move into a market and very quickly assemble a portfolio of rights that are co-extensive with your current products or your current needs is really important anywhere.

I mean, it allows patents to work the way they should work, which is in conjunction with a business objective and a commercial enterprise as opposed to sort of separate from them. So I think it's a good thing, to be able to freely trade assets and put them into -- deploy them in a context where they can be used appropriately. But, again, I want to make sure we caveat it with what's really going on in the market right now. And it may just be sort of the stage of the market, but...

MS. MICHEL: Any other comments on why it's a good thing to have these markets for patents developing?

John.

MR. AMSTER: Yeah. I would echo what Chip just said and say it in a different way. What if you are a software company that decides you're going to go start making handsets? And you are going to be competing with a different set of competitors, you haven't had the last ten years to develop a patent portfolio. The ability to go out and obtain a defensive patent portfolio in that type of situation I think is very valuable.

Then there's the situation Ron talked about which I think should not get short shrift, which is there are plenty of individual inventors who invent something and are

entitled to receive some compensation for the fact that they've made an advancement in the useful arts and they've received a patent for it. And what they invented is now in the market, they just couldn't be the ones to bring it to the market. That's an easy -- that's a harder one for people to get comfortable with.

But take the situation of the failed company. I mean SGI's a great example. That company could end up getting liquidated. Who knows what's going to end up happening. Would anyone argue that they didn't make advancements that are now deployed in the market and those patents aren't valuable? Is it really worse if they get the money for that from their lenders, who are then going to go hire contingency counsel and sue people versus selling it to the company. I would say the answer is no. From a shareholder value perspective, that secondary market is what's enabling them to recover for the valuable innovations that they've created and are evidenced by their patents.

One last thing, though, just to echo what Chip was saying about valuation. I would state what you guys are both saying differently: There are people who are going to sell their patents and those are the people who understand they are going to take a very significant discount to what a

damages expert might tell them they can sell for. And then there are people who won't sell their patents.

Generally speaking, I think Ron would probably agree with this as well, the patents that get transacted are the people who are willing to sell for a significant discount. And that's another thing that I think is very good. The development of the secondary market I think is very, very much firsthand evidence that most patent owners and holders are not going for the litigation, the $400 million judgment. They are going for what is more reasonable compensation. The size of the secondary market is absolutely proof that people are willing to take, that most people are willing to take a reasonable amount of money.

MR. EPSTEIN: In fact, of any ten patent portfolios that I see that are licensable, which means they're strong enough, they've got clear enough claims, not the ink blot claims of Lee Van Pelt, but real claims with a real history, nine out of ten of those people opt for sale over any discussion of licensing. And so the purchase-and-sale marketplace has, in fact, enabled those people to monetize without having to resort to litigation.

MR. GUTIERREZ: Just if I can --

MS. MICHEL: Well, I should call on Tim.

MR. CREAN: I'll make it quick.

MS. MICHEL: Okay.

MR. CREAN: It is difficult to argue philosophically against liquid transparent markets. Okay, now having said that, what I was trying -- the point I was trying to make in the opening remarks is that those markets only work properly and the patent system in general only works properly if the underlying assets which are being transacted are properly scoped.

And the challenge that we've had over the last five, six, seven, ten years has been that the patent quality of the patents which have issued at times has been low. And then the certainty surrounding the scope of the claim has been low.

And then we add on top of those two factors the fact that the methodology that we use to present to lay jurors for valuing those assets is confusing to them.

And so if we don't properly tune those three components, while the secondary market I philosophically agree with, we are going to have problems with the overall system. And to me that's the root cause that we have to focus on and we have to solve. It's Section 103, it's

Section 112, it's patent damages in a reasonable royalty context. That's at the core. And if we don't fix that we're going to see problems farther down the system, where people try to fix it, but the root cause is in those three areas I think.

MS. MICHEL: Horacio.

MR. GUTIERREZ: No, first I'd like to echo what Tim just said. At the conceptual level the existence and development of a secondary market, it is hard to argue that it is not a good thing.

I think from the perspective of a company like the one in which I work in, it provides choice, it provides a number of options that wouldn't be there in the absence of it. Which is not to say the secondary market today is perfect, and it is not to say that it is as transparent as it should be. On the other hand, it is to a certain extent an incipient market. It's one that is just being created. And it will take some time until there is a liquidity and the approach to valuation that really makes for a transparent and more efficient market.

The other point that I would make is that typically when I've heard discussions about the secondary market for IP, the premise for the discussion or the

assumption for the discussion is that somehow there is a causal relationship between the creation and growth of the secondary market and some negative phenomenon, such as the explosion in patent infringement litigation and others.

And to me that is like blaming real estate brokers for the collapse of the real estate bubble. Even though you will find a correlation between the growth in the secondary market and the number of transactions and the value of the market and the explosion in patent litigation, although you will find a correlation, you're going to be hardpressed to find a causal relationship between them.

And I would argue, picking up on Tim's point, that it is the reverse. That it is, in fact, the distortions in litigation that are the result of a number of factors: From poor-quality patents to abuses in the litigation space to the lack of specificity of claims in the context of tech patents, so a number of other factors. It is the explosion in litigation that in a sense is causing, to a certain extent, a kind of inflation in the secondary market that affects valuation of the market itself.

I'm not sure if I've been clear, but to me it is not the same to say that the two phenomena are correlated than to say that the secondary market is the cause of the

excesses in the litigation world.

MS. MICHEL: John, you're nodding. Do you agree with that?

MR. AMSTER: I do. The statements about causation, I a hundred percent agree with.

The one comment I would just make, which is slightly different, is I'd say I've been fairly active in this market for five years, there has not been any price escalation. I think prices have absolutely remained very constant. There's always the occasional bizarre thing and there's always going to be, you know, what I would refer to as the truly crazy entrepreneur-inventor who's not willing to sell.

But I think what has happened is right, the cause -- I agree with everything you guys are saying. There's a fundamental problem with the way certain elements of the patent system work, with the expectations in damages, and because of that you're going to have outliers. And it's those outliers that I think have really driven a lot of the investment into fueling this litigation. It's hedge funds who see a verdict against RIM and then decide, hey, we've got $2 billion to invest, how much does it cost us to buy one of these patents; gee, we can buy 500 patents for $5

million and give them to somebody and let them litigate them for the next ten years and maybe we could get $500 million -- okay, we'll do that.

Right, it's sort of chasing these big numbers that I think is -- and so I agree that these issues around damages are really important for making this market function even more efficiently.

MS. MICHEL: Okay. Lee.

MR. VAN PELT: Well, I think it's important to look specifically at what goes on in the secondary market because there are -- it's diverse. There are the type of transactions that John's described that occur, where people sort of will buy and sell things for reasonable amounts of money.

But there are other things that are going on in the secondary market. For example, a typical thing that happens is you will get a letter that says: Here is a patent and, I'm sorry, but often it is one of the ink blot patents. And here are the claims and here are seven big companies that infringed this patent, or that we think the claims cover. And, you know, I think that sort of thing, and every in-house counsel has, well, maybe under a hundred, maybe over a hundred of those letters that they have

received in the last five years.

And when you get something like that, you're one of the stars of it, it's sort of interesting because someone is trying to sell a patent to someone where they're going to go sue you right away.

There is an awful lot of that that happens as well in the secondary market. And the way sort of the secondary market works with sort of these what I would call kind of a pseudo auction for the patent, because you can't just bid and then bid higher than everyone and then get the patent because then they sort of discuss the bids and it goes up. So it's actually for a big company, it's maybe a mistake to bid in such a procedure because it sort of establishes value, it shows the value and it makes the value higher for a licensing entity to acquire.

So I think there is this sort of thing that goes on and it goes on a lot. And that's sort of one side of the market. Then there's the other side of the market that John's described which is probably a very positive thing. But I think both happen and both should be sort of addressed.

MS. MICHEL: Chip.

MR. LUTTON: I wanted to pick up on this concept

in the secondary market of patents that are being sold specifically for the purpose of being put into litigation, and a lot of times with the claim chart or even a draft complaint and lawyers already picked, which happens a lot.

And we get a fair number of those offered to us with our name on the complaint, presumably so that we'll step up to the plate and buy that patent rather than see it be asserted against us later, which is tempting, you know, and so it has the desired impact.

But specifically thinking about that use of the secondary market, and John's comment that over five years he hasn't really seen an escalation in pricing, I wanted to follow up on that because it may be that the individual patent that, you know, would have sold for five or ten million dollars, the outlier is still a five million dollar asset today, but with the increased volume coming into that market and so many more assets being offered based on the potential for litigation, the potential to bring a lawsuit at that $5 million number, what's happening is kind of the same thing is happening with litigation generally and that is that the value of just the convenience settlement, the cost of litigation type dynamic, where you just buy it to get rid of it, is becoming cumulative and is mounting.

And so, again, for a company like Apple with 30 lawsuits against us and then many more assets being traded in this market, you can't look at it is, well, we'll just multiply 30 or 50 times 5,- and pay that and buy them all up, it's not really a true solution. So the numerosity of patents in our space that can be deployed into this kind of market and sold for the purpose of being asserted times an asking price which may, in fact, not be going up that much on an individual basis but cumulatively is is still a really problematic dynamic.

And, again, I think the way to address that is to get at those root causes that Tim Crean was talking about and really start to say, well, is that a $5 million asset or are we just trading on the false promise of some litigation number that would presumably be multiples of that but isn't really a true value of the patent.

MS. MICHEL: Okay. Ron, and then we'll go to the root causes.

MR. EPSTEIN: I sell a lot of patents, and this discussion sounds nothing like the sales transactions that I engage in.

Maybe it's because I'm one of the tiny number of people with a zoology degree operating in the IT patent

space instead of an engineering degree, but I just don't follow this mechanistic, need for a mechanistic answer on valuation that a lot of this discussion's around.

You know patent valuation looks more like quantum mechanics than it does Newtonian physics. The fact is that at best you get probabilities here. There are no certainties. Even after you've won on validity infringement in court, you still aren't certain of collecting. There's more than a few examples of that in the last few years. So there is no certainty in this business. It is all probabilistic. How do you solve those problems. Typically a market is a great way to handle it. And that market has evolved.

When I started IPotential in 2004 I think we saw three patent purchases and sales in 2004. Last year we participated in, gosh, 40 something, when you add them all up on both the buy side and the sale side. So there's an awful lot of these transactions occurring.

And, you know, the market has responded to the fact that there's a valuation greater than the defensive cost that any one company can bear. I think Chip's point is a good one. It is wrong, I think, for a company like Apple or Microsoft to pay for the defensive obligations of its

entire industry. That there are, in fact, needs for dealing with this problem, which is that ten years ago the cost of using innovation contributed by individual inventors and failed competitors was zero. It was zero ten years ago. Today it is more than zero.

Obviously those who build and sell products would like to pay as little as possible for access to these innovations in the area of innovations from individuals and failed competitors. There needs to be ways to address this rather than one-on-one white knightism. You know, I don't want to give this as a commercial for John, because there's plenty of other ways to handle this problem. But in the end, you know, these are all probabilistic and in my experience pricing pretty much settles out at roughly what those probabilities are.

I know what a -- there's a reason why I can tell what a $1 million patent portfolio is and a $5 million patent portfolio is with a 70-percent degree of certainty which, by the way, is what Colin Powell is sufficient for committing troops to war, right, so it's got to be at least a reasonable number.

And the reason for that is is they look like that. And when I started Intel's patent purchasing program in the

late '90s, $1 million per great patent was the price. And, you know what, that's still what it is.

MS. MICHEL: Do others think that's the going rate, $1 million per patent? I just --

MR. EPSTEIN: Per great, great.

MS. MICHEL: Great patent, okay.

MR. GUTIERREZ: I think what you're seeing is you're seeing a tier system for patents that has emerged as a result of the secondary market. And they're a handful of those patents in the market that will command that kind of price. And there's a ton of patents that you just look at from the nuisance value of the litigation. And there are some that are somewhere in between and you're starting to see some trends with respect to pricing come out of that, which is in the long term not really a bad thing.

The other thing with the secondary market is that with this debate we need to resist the temptation to generalize. There are different players operating in this market that operate under different kinds of economics and for different purposes. I mean, would you even talk about contingency law firms as part of this market? They typically don't buy patents. They don't necessarily buy patents. Sometimes they do, but many times they just enter

into contingency arrangements with the holder of the patent and I think most of the problem really comes from there.

There are some firms that are assertion-based firms. You look at Acacia or things like that. Their business model is to buy patents so that they can litigate against some other firms.

There are others that are portfolio-licensing types of entities that operate, if you will, it's not a perfect analogy, but they're kind of patent pools that are there to aggregate patents and then license. So there's a whole range of them. And I think the analysis of how productive or constructive or positive their engagement is varies depending on who they are.

But the key question is: Would we be facing the same problems in the absence of a secondary market?

Let me put it this way: Is there anything we could have done five years ago or three years ago so that the secondary market wouldn't have existed and would that have solved the litigation problem that we're facing? I don't know the answer to that. I don't know that anybody has the answer to that question.

My sense is that maybe the number of litigations that we face wouldn't be what it is today, but I don't think

fundamentally that would have made the problem go away, which is why one needs to be careful just trying to blame the concept of a secondary market for a phenomenon that's really driven by different considerations.

MS. MICHEL: All right.

MR. THOMPSON: I think there's always been a secondary market. I mean, there were patent portfolios for sale 30 years ago. I know because I bought some of them and I've seen some of them used against me. So this is not a new phenomena. I mean I think I agree, I think the primary new thing is that you're seeing, you know, almost like individuals buying a patent and then going to a contingency law firm, and that's a new thing. You know that was something you didn't see 20 years ago.

MS. MICHEL: So root causes. Let's start with the ink blot patent, we can then go into damages. I'll make sure we save some time for damages, I promise. We'll also have about two and a half hours on damages tomorrow afternoon, if you're interested.

Okay. Do others agree that there's a problem with just ambiguity and uncertainty in the patents that you see asserted? What's the source of that ambiguity and do you have any suggestions on what to do about it?

Lee, you've brought up the term "ink blot patent."

MR. VAN PELT: Sure.

MS. MICHEL: What do you think?

MR. VAN PELT: Sure. You know what I mean by that is, for example, a patent where the words in the claim are perhaps only used in the claim. If you do a search on a term in the claim and you look in the specifications of the patents, you don't find the term.

At that point it's very hard to tie down exactly what the word means if it's not even used in the rest of the patent, and that happens. So the idea that claims have to be definite, the principle, that patents can sort of be filed and then the claims can be massaged over the years, and continuations and continuations in part is a problem and it's an issue that, you know, the courts have done so much with the *eBay* case and the *KSR* case to improve things. But I think definiteness in the claim, support in the claim, and the one interesting judicial doctrine is that you can sort of write your claims and then several years later see your competitor's products and change your claims specifically only after seeing what someone else has done is an interesting principle that I think needs to be addressed -- would be helpful if it was addressed by the courts.

But the issue is really the Patent Office can do a lot and has done a lot in terms of improving the definiteness of claims, but there's still all these patents that have been issued over the years where literally you look at the claim and it doesn't match anything you learned in the specification.

And perhaps another thing that could happen is that's not a basis for reexamining a patent now. You can only reexam based on published prior art. If you could expand perhaps what you could reexam on a patent you could fix some of these patents in the reexam process, which is much, much less costly for companies, that might be a good idea as well.

MS. MICHEL: Alex.

MR. SOUSA: I think the solution is just basically better writing. I mean right now the passage rate of patents is I think around 40 percent, is roughly what -- and I think that's a good thing. The reality is there's a lot of crappy applications out there.

And I used to be a patent prosecutor myself. And usually what happens -- I'll tell you guys the truth. What happens is at a law firm you see an inventor in a company. You spend ten minutes with them. They have: I have this

idea for kind of something this.

You squiggle something on a sheet of paper. You know, the partner gives it to the associate who goes back and generates 30 percent of a patent application and makes some of it up and guesses. But we didn't call it -- we'd called it inferring. We would infer things, and then this gets submitted. And then you have kind of, sort of a crappy patent. And then this gets prosecuted and they just wear the examiner down and these things get issued, all right. And that's the source. The source is there's just crappy applications.

And if we clean that up, you know, everything after will be cleaned as well. In my specific company, I mean I'm notorious, I tell guys: Show me the meat. Where is the meat? Where is the meat? And it's just a gruelling exercise I do with engineers and chemists, but I want to make sure my applications are rock solid, that they have substantial enablement, that my claim structure is clear.

I go through. Lexis has a program for writing patents, I forget what it's called, like -- it's actually a good program. It checks my claims, make sure my language is in the description. I mean I scrub it. I rescrub it. I give it to a law firm and they scrub it. And I try to do

the best job as I can to make this thing rock solid. So if it ever goes into litigation, heaven forbid, right, the word I use in the claim is exactly the word that's in the abstract, that's exactly the word that's in the description. My patents are monotonous and repetitive, right. And they should be because it's going to be hard to say that I didn't use the right word.

We just need to do more of that and better -- I get better writing, better enablement. And I hope the Patent Office stays tough and gets tougher on some of this stuff and doesn't allow these basically crappy kind of applications. I mean, you know, just say what you mean, mean what you say, put it in there, enable it, give examples, be very clear as to what you want, and when you do that things get issued. You know, big surprise. Our applications are getting issued.

MR. VAN PELT: We have sort of an issue that's sort of -- because of the era that we're in, the issuance rate is 40 percent, --

MR. SOUSA: Yeah.

MR. VAN PELT: -- but it was 90 percent. And those issued patents are out there and that's one of the things, is just sort of improve the ways that we can deal

with the stuff that was issued at a time when the philosophy was more: People who file patents are the customers of the Patent Office and we need to help our customers get patents. I think that there is that era which caused sort of the bubble in patent filings and the bubble in patents getting issued that probably shouldn't have been issued. Those are out there and represent a cost and a drain on companies. And a better regime for handling those is something we need because of this era that we're in, that the rate has changed.

MS. MICHEL: Lee and Alex, do you think that stronger application of 112 doctrines would help with this problem?

MR. VAN PELT: Absolutely.

MR. SOUSA: Yeah. Yes.

MS. MICHEL: And written description requirement, enablement, definiteness, do you break those down in any way, or all three?

MR. VAN PELT: I'd -- well, they're of course broken down, and I think you have to. be you sort of the written description requirement I think is one of the most important. This sort of principle the courts are having in the *LizardTech* case, line of cases, that a very narrow

disclosure of something supporting -- you know, claiming the whole field is another issue that's -- that I think is really important. That's one of the things in my patent law class we focus on the most. How much scope are you entitled for a given disclosure? That's a question the courts are struggling with and it's probably going to be one of the most important issues in the next couple years that they struggle with.

But the written description requirement, you have to be able to see that -- the specification should show that the inventor was in possession of the invention at the time the patent was filed. That's, I think, the bulwark against this principle that the claims sort of evolve and morph and end up meaning something in the example you gave, which I think happens but is not the majority of the case and certainly not something that happens all the time; but -- that where you have sort of this sort of ten minutes from the inventor and it becomes something it never was.

MR. SOUSA: You know I think something that the Patent Office would not admit but I think the general philosophy is: You know, hey, come on, you pay a thousand bucks, we'll look at it, do some prior art. You know, I mean, come on, if you really have a problem with it, that's

what the courts are for, right?

Because, let's face it, what is it, less than one percent of all patents get litigated, so it would be from an economics perspective it would probably be uneconomical to really do a thorough search and really do a thorough job on every patent that goes through, so they do a cursory inspection, right? You know, they do a cursory exercise and they figure: Hey, you know, that's what the courts are for. You know, if you have an issue with it, that's what the courts are for.

And I think that they wouldn't admit that, but I think that that is sort of the philosophy, that, you know, --

MS. MICHEL: Alex and Lee, what's your impression of the extent to which the Patent Office enforces the written description requirement and enablement in the mechanical and electrical arts? It's clearly very strongly enforced in biotech, but what do you think about in your area?

MR. VAN PELT: Well, I think that what happens -- I mean the issue really is not so much driven that the patent -- I don't think the Patent Office has the attitude that you're describing, Alex, but I think that they have a

limited number of resources they are given to examine a given patent. And, you know, if a patent's filed with a very lengthy specification and the claims are complex, it can be difficult, it can be extremely time consuming.

I mean I often say that if I were sort of able to evaluate the state of a given art and really give you a strong opinion about whether or not something that I've been shown advances the state of that art, I could probably make more money on Sand Hill Road than I could working for the Patent Office.

And so it's fundamentally -- examining a patent is an extremely hard to do, that examiners are given a very little amount of time to accomplish. And I think realistically understanding that is really the fundamental thing to do to understand why sometimes patent quality isn't what it should be.

I think that the written description requirement is something -- the examiner has so much else to do -- it's something that's easy for them to miss.

MR. SOUSA: Yeah, I would agree with that. You know something else too is the Patent Office works on I think a chit system or a credit system, where with everything they process they get like a little mark, like a

ticket, I think a chit. So as a prosecutor I used to do this all the time, you used to know when their fiscal quarters are, right, and you call them the week before your fiscal quarter, get on the phone and say: Hey, let's make a deal. You want it, I want it, let's make a deal. And you could get a lot of things allowed the last week of the fiscal quarter, all right. And anyone in the industry knows this, and that's when you do your deal. That's when a lot of the deals happen, that's when a lot of things get allowed, right.

MS. MICHEL: Chip.

MR. LUTTON: I think we're on a core point here about the big problem is being this disconnectedness between the written description of the invention and the scope at which the claims are applied or interpreted, sometimes years later.

In terms of how to address it, I think there is more development needed in the Section 112 law. I think a stronger sense of the written description requirement that really does tether the scope of the claims to more what the inventor actually brought to the table would be very helpful. And that's a particularly challenging thing to do in the context of information technology terminology, where

often the terms themselves can sound sort of generic. "Processing," well, is that the narrow meaning of processing or a broad meaning. And storing something, are you going to look at what the inventor actually said was how you stored and where you stored or are you just going to say storing means keeping it.

And that dynamic gets a lot worse when you have the PTO perhaps examining under one set of assumptions and then a court applying an entirely different set of assumptions ten years later. So a stronger sense of 112 law that really addresses that, better PTO attention to these 112 requirements. And by that I don't mean only rejecting claims at the outset, but also doing more examination on the record and documenting the assumptions of where is the support for the claim elements, which might also require some applicant burden, that would be an investment worth making. Because then when you get into court years later, you can say: Well, what did the PTO think was the support for this claim and let's tether again the application of the patent back to the assumptions that gave rise to its grant.

MS. MICHEL: Any other comments on what we're calling the root causes or Tim called the root causes on this scope, notice issue, ambiguity, the uncertainty

surrounding the claims.

Ron.

MR. EPSTEIN: Yeah. I'll just provide this comment, because I actually think the debate's good and, in the end, no one can argue with the importance of patent quality and no one can really argue that there are systematic issues that are preventing patent quality.

But you know I will point out that any process that takes five years to engage inherently is going to head towards a low-quality product. I mean, when I was at Intel we were taught all about process management, and quality is delivered through a known process with check-in point. So without getting into a broad indictment of the overall patent system, you know, if you've got a patent prosecutor and it's five years from the time they write the initial patent application, by the time that patent issues they probably have a few other things to worry about in the intervening five years.

As a consequence I think you get a real departure from quality. If nothing else, if we could compress the time so people are paying attention in a more compressed time, I think that alone would get you much a better-quality answer.

MS. MICHEL: Horacio.

MR. GUTIERREZ: I'll just briefly say that one cannot really overstate the importance of this. I really think it's probably one of the most important areas of discussion.

I feel often when one looks at the debate regarding patent reform, whether it be, you know, in the Senate or in the House or in other kinds of reform of the system, because of the political dynamics one ends up focusing on things that really come later in the process. And you're trying to address the consequences of failures that have happened in the system much earlier in the process.

And, you know, more robust postgrant review procedures are a good thing, but that shouldn't be the primary means by which you're going to solve a quality problem. And I think that stricter disclosure requirements under 112 and more enforcement and attention into it, as Chip was saying, by the Patent Office is perhaps one kind of administrative patent reform that would have the ability to be the most effective to addressing these things.

There are litigation-abuses issues and there are unpredictability in the context of it. It's a complex

issue, but I would say, because you were talking about root causes, I think it is right to put attention on this issue as one of the key root causes of the overall problem.

MS. MICHEL: So damages, how do the amounts that might be awarded in court affect the price of the patents? Why are damages important to you? A couple of you have brought it up a couple of times, so I'll just throw it out there generally.

Anybody want to talk about damages?

MR. GUTIERREZ: We have the privilege at Microsoft of having three of the top ten verdicts against us. And we're striving to be at the top all the time, so we're...

MS. MICHEL: Three of the top five even?

MR. GUTIERREZ: No, it might be two of the top five.

MS. MICHEL: All right.

MR. GUTIERREZ: And it is a huge problem. Anybody who knows anything about this knows that patent cases are complicated on the law. They're made even more complicated because of the patent-quality issue that we've talked about. They are clearly complicated on the technology.

And when you have a system in which all kinds of expert testimony, whether it's relevant or sufficient or

not, can find its way to a jury, you are going to have -- you are going out find a lot of unpredictability on the outcomes.

It gets a lot better when you go on appeal, but in the process you've had to fund this litigation and run with the business uncertainty of having those huge verdicts sort of hanging over your head.

MS. MICHEL: John.

MR. AMSTER: So I think that some of the damages awards out there have a very clear impact on people's expectations. I guess what I would say so I think it's very important that there be more certainty and limitations put on the potential for damages. And I think that's going to be something that will help, but I would caution that it is not going to make a problem go away, because there's always going to be people who believe that they are the exception to the rule somehow. In any system like this there always will be need for exception.

And when we talk about the secondary market, in particular, the discount that we're talking about, from an expected-litigation outcome, is so significant that even putting significant limitations on it, you know, you're still going to need sellers to be a different level of

realistic in order to sell.

In other words, somebody thinks they could get a hundred million in litigation, they need to be willing to sell the patent for a million dollars or two million dollars. So you're talking about the seller having a different level of expectation to start with. But, that said, it would be much better if you didn't walk into that initial discussion with somebody saying: I think my patent is worth a billion dollars, I've gone to patent damages experts who have said that. And then having to explain to them why their patent damage experts are just selling them a bill of goods.

MS. MICHEL: Okay. Ron.

MR. EPSTEIN: I think passing significant changes to damages law is the fastest way to shut down the overall licensing and secondary patent marketplace. I think that would do it right there.

The cost of monetizing a patent, the cost of enforcing a patent, and let's assume for purposes of this discussion it's a valid, enforceable, real, non-ink blot, someone-actually-invented-it patent is high. The cost of enforcing it is really quite high. And, as a consequence, no one would invest in such a risky enterprise with high

costs without a high potential for return.

So, again, there's great variability in the quality of patents and without doubt there's been some big verdicts on some really crappy patents. On the other hand, there's been some big verdicts on really good patents as well.

So if you want to shut down the overall patent licensing marketplace, if you want to shut down the secondary patent sales marketplace, by all means, let's put greater limits on damages.

Yes, unpredictability is a bad thing. But unpredictability is the only thing that's allowing these patent owners to get the access to capital which allows them to actually try and get a return on the patents.

MS. MICHEL: You say the unpredictability of the thing that's allowing them to get the capital. Can you explain that?

MR. EPSTEIN: Let me say that it's not predictable that the damages would be quite small. You know one of the things we talk about a lot I think is the patent picket fence or patent loading. And, you know, that's an interesting -- I've been on both sides of this. I've been wandering around protecting the world's largest amount of

money made from a single piece of silicon, on the one hand; on the other hand, representing individual inventors. And it's a tough decision to make.

You know, there's the: Gee, I'm integrating lots of technology. The marketplace wants that. You know, on the other hand, is it a defense to infringement that I infringe lots and lots of patents?

MS. MICHEL: There would seem to be a problem with extracting any value from a patent that was worth less than $5 million, if that's what it takes to litigate. Any thoughts about -- is that a real problem and any thoughts on how to deal with it?

And, Lee, I'll go to you next, and any other comment you were going to make.

MR. VAN PELT: Well, I think the damages, if you significantly lower the damages that -- or the royalty that a patent owner can get for their patent, that you're going to -- if it costs a patent owner $5 million to litigate the patent, then they're going to get less than $5 million, then they won't have a credible reason why a company would need to pay a royalty and license the patent. I think that that's clear.

I think we have -- many changes have been made to

patent law, and you know the injunction issue has been essentially fixed by the *eBay* case, by moving it more to a reasonable standard.

And, on the damages issue, I think courts have taken a similar approach of, you know, that there are not going to be hard and fast rules, that they're going to make a reasonable determination. But if you get the patent that's valid, the patent that is a high-quality patent, then you ought to be able to get revenue for it and you ought to be able to get royalty revenue from it. And that's not a bad thing.

MS. MICHEL: Earle.

MR. THOMPSON: Yeah, I'll go a little bit further than what Ron did as far as, you know, what you shut down. What you really will shut down is the entire innovation, because there is no reason to invest in the R & D. Become a free rider on somebody else's investment and just build the end product. But, otherwise, there's no reason for me to go spend that money. I'll go live off of him over there.

And eventually when everybody lives off the next guy, nobody is inventing anything. And you will have the occasional one, just because they think it's a good idea, they'll go and invest in it, but then everybody steals their

idea. So it's not a very good thing to really put sharp limits.

MS. MICHEL: Chip.

MR. LUTTON: I just want to say the issue for me in the damages context is not the specific verdicts that were excessive. It's the uncertainty that's engendered by a standardless application of 15 factors in front of a jury in a process that doesn't provide the discipline of any tying necessarily to what this patent actually represents in terms of the value that it could have obtained outside of this hypothetical or fictional courtroom exercise.

And, just anecdotally, we routinely see two and three orders of magnitude deference in the valuations that are espoused by an expert for one side and an expert for the other side in front of a jury. If you've got a thousandfold difference in what people say the patent's worth, that issue should not be going in front of a jury. There's a real problem in the law that permits that kind of uncertainty to be carried forward into a civil litigation context and then presented to a lay jury.

What that says to me is that there's more need both in gatekeeping procedural function and in a substantive function of bringing these results back into a narrower

range that replicates what actually can be reproduced in the real world, with comparable assets and in comparable circumstances -- maybe the same assets in some cases. But to indulge the idea that every patent is an entitlement to go in front of a jury and ask for whatever you want under this 15-factor test, open-ended test, is not a service to promoting true value around IP.

And kind of to Ron's point that, well, if we take this uncertainty out of the system, then all patents become less valuable, I mean, I think you got to remember, I mean we are issuing 2-, 3-, 400,000 new patents every year in the country. We can't afford to overinflate all of them in order to preserve the sense that, well, some of them might be valuable, we need to have them all push this degree of uncertainty in order to make sure that we continue to invest.

I think the fact is that that some patents may be worth less than what it costs to go to court. And, you know, frankly, contract disputes have the same problem, slip and fall have the same problem. It just so happens that patent litigation is very expensive, so the threshold is higher. But I don't think we should beat ourselves up and try to make sure that every patent by virtue of the

uncertainty in the damages law has some enhanced value just so that it can be traded in this way.

So I really come at it very differently, and I don't think that we can afford to overinflate damages in the way that they are. And I think we need to -- I think it is this litigation construct that I think gives rise to what is becoming increasingly a tax on really productive use of innovation in intellectual properties.

MS. MICHEL: If you have such wildly different valuations of a patent, you talked about a thousand-times difference, going to a jury, what's the source of that huge difference? Does it indicate a lack of transparency in the market, is there anything we can do to increase transparency in the market? Would it be helpful?

MR. LUTTON: Can I answer that?

MS. MICHEL: Yeah, please.

MR. LUTTON: I would just -- and I mean I won't get into the details of what it might look like, but I think transparency in the marketplace, better information about the actual selling price, the actual licensing price of intellectual property would be extremely valuable and would go a long ways towards giving something that's real to point to as a comparable instead of something that's a fictional

construct.

MS. MICHEL: Would that require some sort of mandatory reporting of licenses, though?

MR. LUTTON: It wouldn't require it, but I think that might be an idea that would be useful.

MR. AMSTER: We're having businesses that publish rate cards and do large volumes of patent transactions say what they're going to buy, say how much they spend on it, and basically report and let people know what they charge companies to license it. I mean not as a plug, but I completely agree with the transparency.

And I think what's important in looking at the damages debate in particular is not to go to hyperbole. There is a long way to go to create transparency that is far from putting unrealistic limits on the value of a patent, so that's like saying because we have MLS and can see what houses are sold for, no one's going to invest in real estate. Because we're creating rates that are publicly traded and you can see that, no. Right, in any market there is a degree of efficiency -- of transparency that can be established through a variety of means that will help the situation.

So I'm not talking about making it -- having a

damages system that doesn't make it valuable for people to invent, and I don't think we should think about that, because there is a huge spectrum of change that can happen that doesn't come anywhere close to making it not valuable to invest in R & D and develop patents and then be able to monetize them, yet still eliminate that order-of-magnitude difference when people walk into court.

MS. MICHEL: Tim.

MR. CREAN: Yeah. I think for the past five years the different sides have been talking past each other in many different ways. I think there are very few people who are interested in this topic who believe in over compensation or under compensation. I think we all believe in giving the innovator the proper value for their innovation and the question is how do we get there. How do we set up a system where we can properly value that asset.

And we at SAP along with a number of other tech companies filed an amicus brief in one of Horacio's cases and in one of Lucent cases where we tossed out a few ideas. And, you know, one, which has obviously been talked about a lot is the gatekeeper role. This is the first role where the court should be policing a type of evidence which comes in. To pick up on Chip's point, it needs to be comparable.

And if it's not comparable, the court should be bouncing that evidence.

And Judge Rader recently did that in the *Cornell* case and at least to a partial benefit of HP, not a full benefit, but it's that type of gatekeeper function which I think can be helpful, but it's not enough.

One of the problems that leads to this unpredictability, at least in certain cases, and the damages awards are not always unpredictable and they're not always over compensatory. But there are enough which are that it can provide an in terrorem effect on those who are largely in the defendant's chair in these kinds of cases.

But I think that it comes from having the *Georgia-Pacific* factors given to a lay jury. And if you think about what we're trying to do, we're trying to take an intellectual property asset -- which you can't feel, you can't touch, you can't see, right, it's just described by words -- it's a legal document on a technical subject matter, and we give it to those who don't know the law, don't know the technology, aren't used to dealing with this industry, and then we give them a list of many, many factors and say: Now tell us what the value of this asset is.

I think one of the things we try to do in the

amicus brief is we try to talk about how can those factors be better framed. And it's talking along the axis of the judge playing the gatekeeper to ensure that the evidence that gets through to the jury is of a similar royalty base, a similar royalty percentage, a similar license scope, covering a similar patent. And that when you do that -- and, by the way, the *Georgia-Pacific* factors actually fit into that kind of instruction very nicely -- that when you do that you are framing the issue for the jury to think about those factors instead of just tossing these factors over to the jury in a way in which must confuse them. It just must confuse them.

And then you get these awards that come out, some awards that come out that are just wholly untethered to the underlying value of the patent or the actual harm suffered by the plaintiff.

MS. MICHEL: Ron.

We'll just go around and then we'll wrap up.

MR. EPSTEIN: You know, I think between Chip and Tim here I think some really good points have been made here. I think the danger or the trouble we're all trying to figure out is that the distinction between a high-quality invention, which is a major contributor to the value

proposition of the product which incorporates it, and something that's trivial is hard to bring down into algorithmic kind of way of understanding what its direct relationship is.

And, you know, I think Southern Pacific tries to get at that, but by nature technology's too -- I'm sorry -- *Georgia-Pacific*. You know, I'm thinking of the train I take. Anyway, I think those standards try to get at it, but this is inherently a question where it's very difficult to understand in some generalized way how you're going to value the value of a particular invention with particular production ahead of time with some sort of algorithmic rule.

I think finding a way to provide clarity that does not take away the opportunity for a true innovation to be properly compensated but, nevertheless, has predictability would be the goal of everyone.

MR. GUTIERREZ: Yeah, just to your point regarding mandatory disclosure requirements, I am very skeptical that mandatory disclosure requirements for licensing first would do anything to help with this problem, but second that it's appropriate.

I think there are a number of -- there are concerns anybody that the disclosure of sensitive business

information that would come into it. I think there are mechanisms to have licensing information come to light. Certainly the defendants in the context of patent litigation, to the extent that they've done licensing in the past, that's information that would come to light. There are mechanisms to have it come to light when the plaintiff has entered into those.

But in general I would say in line with the comments that we've made, that this is a market that is nascent in many respects. And it would seem to me that from a regulatory perspective that we ought to err on the side of caution before starting to regulate and require things that we really don't know what kind of impact they would have in the marketplace.

MS. MICHEL: Alex.

MR. SOUSA: Yeah. You know what, when I was at law school I ended up externing for a federal magistrate judge. And I would like to tell you it was because of my charm or my academic brilliance, but I'd be lying. The reason I got the job is because I'm an engineer. And he wanted an engineer on his team, because he handles IP cases.

So at the court there was a lady who was in charge of all the death penalty stuff, I forget what you call it --

yeah, and they specialize in death penalty law because that's sort of a body of law unto itself. And I think a great idea would be in each federal court to have somebody who's a technical person.

I mean most federal judges are very good, but they tend to be English majors, right. Very few federal judges, I would imagine, are engineers, chemists, biologists. And IP cases are engineering, you know, computer science, biology. So they should at least have something on their staff who can at least generally understand what this stuff is before you get the bottle of the experts started, so.

MS. MICHEL: Earle.

MR. THOMPSON: Yeah. On the -- you know, picking up a little bit more on the mandatory disclosure of licensing terms and things like that, one of the biggest issues is not everybody is in the same position. You know I may be cross-licensing somebody who has a very substantial portfolio. Obviously that vastly affects what a royalty rate may be, and there may be no royalty in that situation or there may be somebody who is willing to come into the field and there's more to it. You know just a raw disclosure of that kind of data, absent the entire thing, is absolutely worthless to most people and, in fact, would

probably be quite confusing at the end of the day. Well, why did this person get zero and this one six percent. It's the same thing.

So I sort of agree, I don't really know how you would implement any kind of mandatory disclosure that would be useful.

MS. MICHEL: All right. Lee.

MR. VAN PELT: Yes. And we see this issue when companies are obligated to grant a RAND license, or a reasonable and nondiscriminatory license in a standard setting. Well, one of the frustrations is, well, what's discrimination, because all the companies are different that are getting licensed, so you're not discriminating against. So does that mean the royalty rate's the same?

It's very different without seeing a whole license to be able to determine what -- whether to compare rates.

MS. MICHEL: All right. Very good. Unfortunately, we need to conclude to take a lunch break and come back for the afternoon. This has been a super panel. Thank you very much.

The FTC, we're taking comments until May 15th. You can submit them on our website and we're also happy to talk to anyone who has more input for us. Thank you very

much.

(Applause. Luncheon recess taken from 12:41 p.m. to 2:13 p.m.)

PANEL 3: MARKETS FOR IP AND TECHNOLOGY: ACADEMIC PERSPECTIVES

MODERATOR:

JOEL SCHRAG, FTC

PANELISTS:

HENRY CHESBROUGH, Adjunct Professor, Haas School of Business, U.C. Berkeley; Executive Director, Center for Open Innovation

BRONWYN H. HALL, Professor of Economics, U.C. Berkeley; Professor of Technology and the Economy, University of Maastrict

ROBERT P. MERGES, Wilson Sonsini Goodrich & Rosati Professor of Law and Technology, U.C. Berkeley Boalt Hall School of Law; Director, Berkeley Center for Law and Technology

MARSHALL C. PHELPS, Corporate Vice President for IP Policy and Strategy, Microsoft Corporation

ROSEMARIE ZIEDONIS, Assistant Professor of Strategy, Stephen M. Ross School of Business, University of Michigan

P R O C E E D I N G S

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MR. SCHRAG: Okay. Good afternoon. And welcome back to the FTC's hearings on the evolving IP Marketplace. My name is Joel Schrag. I'm an economist in the Bureau of Economics at the Federal Trade Commission. And it's my pleasure to welcome you to our panel on Academic Perspectives on Markets for IP and Technology.

And we really are delighted this afternoon to have a great group of panelists with us who spend a great deal of time thinking about how these markets work and the role that patents play in these markets. So we're hoping to talk a lot about the issues of whether these markets are working well and potentially what sort of public policy changes could make them operate even better.

We have one panelist who unfortunately was unable to be with us today physically, but we've arranged to have her here electronically. And I think what we'll do is hear from her first. The panelists are each going to have an opportunity to do a short presentation on some topics or questions that they particularly want to emphasize. And

then after those presentations are done we will have the opportunity for a roundtable discussion.

So hopefully Rosemarie Ziedonis is with us by telephone from Ann Arbor.

Rosemarie, are you there?

DR. ZIEDONIS: I'm there.

MR. SCHRAG: That's great. So we're going to begin by hearing from you.

DR. ZIEDONIS: Great.

MR. SCHRAG: Rosemarie is an Assistant Professor of strategy at the University of Michigan's Stephen Ross School of Business and CoDirector of the Program in Law, Economics, and Technology at the UM Law School. She's the author of numerous papers on the value and strategic use of intellectual properties as well as broader aspects of technology and innovation management. She has prepared some very interesting slides for us today, and I will be managing that aspect of her presentation.

So, Rosemarie, when you're ready, I have your presentation up on the screen.

DR. ZIEDONIS: Okay, great. First of all, thank you, Joel, for making this possible for me to participate. I have not really given a joint presentation since my old

days of presenting work with Bronwyn, so this is quite fine.

And, Bronwyn and Hank, hello. And hello to others on the panel and at the event.

So one nice thing about participating, as Joel gave us some flexibility, in just presenting trends and things that we thought might be relevant either directly to the topic at hand, which is how these markets for intellectual property actually function or not, which may be the case of my presentation.

So one of the things that I would just like to focus on is the role of start-ups. We traditionally think of them as sources of new technology, so for those of you there in the Wells Fargo Room and near San Francisco, we think of this with, of course, Google and search-engine technologies or YouTube with video streaming. But, of course, when we are thinking about markets for patents, start-ups, I think, are also an important supplier in those markets. So I'd like to provide just some framing around those issues. So if you go to slide 2, please?

So relative to large public firms, I think that start-ups tend to fly below the radar screen of academic research. Thankfully there is momentum going to change that, but still I think we know a lot more about the

innovative activities and also the patenting activities of larger public firms relative to start-ups.

Now there are several reasons why, in part because we lack the comprehensive SEC-required databases like Compustat and others for public or private -- I mean for private and smaller companies. There are databases like Corptech, and Venture Economics, and VentureOne, which are extremely useful, but they also have reporting biases that we need to be aware of when using them.

There are also pesky name changes that for the entrepreneurs in the room I'm sure that that makes a lot of sense when you're redirecting your companies, but it sure makes it hard to track your patenting activities because it's hard to then match which company names are the same company and bundle patents accordingly.

Then, of course, many companies exit either through acquisition or liquidation sometimes two, three, four years after founding, which makes it difficult to then identify patents coming out from these firms.

Now despite those challenges to research, I think there's a widespread acknowledgment that start-ups are important, not just in generating new technologies but increasing attention to their role as suppliers in these

markets for patents as alluded to earlier. Perhaps one example of that is the Commerce One, the controversy surrounding the Commerce One patents that come of course, generated multiple millions in revenues at auction.

So the goals of my presentation, moving on to slide 3, are really to provide some framing around this and maybe even tying together some material that perhaps was discussed in the IT and life science panels earlier from today. So I'd like to provide just some summary statistics that I have compiled on patenting activities of start-ups in two information technology sectors, semiconductor devices, bridging on to some work that Bronwyn and I have done together, and then software. And then I'm tracing those patterns over a fairly long period of time from the mid-1980s through 2005. Of course that is particularly interesting in the context of software, where we've had a lot of legal rulings, both in the case of copyright and in patents, particularly through the decade of the 1990s.

Now for a perspective, which I think is sometimes lacking, we tend to either focus on IT or we focus on life science, but for perspective I'd like to place some of these trends alongside comparable statistics in one life science sector which I have selected as medical devices.

Now the data that I am going to be showing you are part of an ongoing study of patents and entrepreneurial firms financing that in the process of working on some of which is coauthored with David Hsu at Wharton.

So going to slide 4, the sample of firms that the data are based on, so basically what I've done is to collect a similar cohort of start-ups, these are all US-based companies that were founded during the period of 1987 through 1999, which then gives us, you know, the period of years postfounding to track their patenting and also financing activities.

Now all of these companies received at least one round of venture financing. And part of the reason that restriction is on there is one of my primary data sources is VentureOne, which has been a really useful source of data, not just on founding years, but on name changes of these companies. So we emerge basically the VentureOne financing data with a pretty extensive search of Delphion for the searches of US patents awarded to these companies through 2005.

So going to slide 5 the sample size is reasonably large. I've got about -- so if you look at the bottom of the slide -- about 300 semiconductor device start-ups,

almost 600 medical device firms founded during that same period. And then look at the number of software companies, so about 25, more than 2500 software companies. Of course that larger number is indicative both of the Internet bubble -- recall that I've got founding years 1998, '99 included in there. So that's picking up on some of the widespread entry during that period. And also I think it's reasonable to assume that there are lower cost of entry in software relative to the other two sectors.

Now the bars in this figure are the numbers of patents collectively awarded to these companies through 2005. You'll see that overall about half of these patents are awarded to the medical device companies, perhaps not surprising. And the remainder is divided about equally between the semiconductor companies and the much larger number of software companies.

Now when -- interpreting anything out of these statistics is a little bit difficult, because we have several things going on here. We've got patents, but we also have larger numbers -- a variation in the number of companies and the amount of capital that they would have to devote towards patenting activities.

So moving toward slide number 6, coming at this

from a slightly different angle lets us kind of, I think, get a clearer picture of the intensity with which start-ups in these sectors are filing patents. So here I'm going to just take an average to depict how aggressively the average startup in each sector is filing patents. And as a proxy, what I am doing is using the cumulative amount of funds raised. So this is private equity raised preexit, regardless of whether that exit is liquidation, acquisition, or IPO.

So moving to slide 7, this is a plot of what I'm calling here are the average propensity to patent. Normally when we compute these statistics for public companies, we denominate this by R & D spending. I don't have that for private companies, so that's why I'm using this cumulative amount of funds raised.

So to interpret these statistics, here it looks more like the medical device companies and semiconductors are -- the gap between those is actually more narrower than may have been suggested at just the cumulative volume of patents. This suggests, just to focus on medical devices in the middle, that the average start-up in medical devices is successively filing nine patents for every $10 million of funds invested. That's about 6.5 patents per $10 million

for semiconductors and then much lower thresholds -- not surprising to many of the room, I'm sure -- about three patents per $10 million for the software companies that patent.

Now moving on to slide 8, another way of looking at this is to compute the percentage of start-ups that successfully file or receive patents -- and I should make clear that I'm only looking at US patents, as was perhaps clarified in an earlier slide, but I do not have data, just to be clear, on European or Asian filings.

But moving then to slide 9, I compute this percentage of start-ups with patents pending or granted, dividing the sample into really two different viewpoints. The set of bars on the left are looking at the exit or the last round of financing. So this includes companies that went bankrupt and also those in the sample that are still private. Then if you look at the right side, we have just as the subset of companies that successfully exit through an IPO.

And there I think it's pretty interesting to see that almost all of the start-ups in semiconductor devices and medical devices, so the two device sectors have patents before filing an initial public offering. And about 50

percent -- so this actually hovers closely to some statistics that Ronald Mann had shown in an earlier and smaller sample. But about 50 percent of the software companies that filed for a public offering have patents. And that's aggregated over the entire '87 through 2005 period.

So moving to slide 10, I'd like to zoom in and look at trends over time for just that IPO subsample.

So going on to slide number 11, what I've done here is plot that similar percentage with patents pending or awarded, I should say, at IPO by the sectors over time. And starting in 1995 going through 2002, just to give you a sense of the trend, I think it's pretty interesting. I mean, here you see the general findings. It's highly unusual for device companies, whether it's medical devices or semiconductor devices, not to have patents pre-IPO, almost all of them, so 95 percent to a hundred percent have patents pre-IPO during that entire sample.

I think it's even more interesting to look at the trend line in software, which is the bottom bar that climbed steadily from about 38 percent up to over 80 percent between 1995 and 2002. Now that's consistent with work, recent work, of Bronwyn Hall with Megan McGarvey and others,

suggesting that some of these legal rulings that tilted preference more toward software, toward the patenting of software-related inventions and increased actually, I should say, the private value of patents in software-related arenas.

So moving on to slide 12, I think another interesting snapshot coming through with the trends in our data is appearing for the subset of companies listed as failed or defunct by 2006.

So let's look at the same percentage of start-ups with patents pending, except with that subsample of failed companies in slide number 13.

So here we see at the top that -- you know, again it's -- medical device companies file patents regardless of whether they're going IPO or go bankrupt. We have a high percentage consistently of medical device companies with patents that fail. More interesting I think is the upward trend line in both of the IT sectors. So it looks like for semiconductors we have an upward trend starting around '99. And then for software perhaps more recent and not to the same, perhaps, degree but still an upward trend in the percentage of failed companies that have patents by the time they are the liquidated.

Now a couple of things, I think, are interesting in terms of how we might interpret those statistics. And admittedly my interpretation here is somewhat speculative. But one interpretation could be that this is just part of the overall increase in the propensity of these firms to file patents in the wake, especially in software, of *State Street Bank* and some of these other rulings.

I think it's also plausible to think about this as the increase in the shakeout of higher-quality, if you will, start-ups in IT sector following the plummet in technology and also financing markets for these companies post-2000. So if that latter interpretation is correct, I think what this means is that you have an increase in the supply of failed and also higher-quality companies that could presumably have both higher-quality technologies to offer and perhaps reasonably valuable patents surrounding those technologies.

On slide number 14, this is just to give you a sense that these are not necessarily small numbers we're talking about, even with my sample of only venture-backed companies. Look at the number of failed companies in software. If you add up the number of defunct software companies in funding years that were last funded in 1999

through 2001, over 500 of these companies in the sample -- of course not all of them have patents, but an increasing share does, as suggested by the earlier slide.

So, in summary, going to slide 15, among VC-backed start-ups, I think that these slides show that a relatively large share of resources is devoted towards patenting activities, particularly in the two device or product, you might think sectors, semiconductor devices and medical devices. Now that finding perhaps suggests that IT start-ups and medical or life science start-ups may not be so different as we typically characterize them in the literature.

In the overall '87 through 2005 period, clearly the software companies are at a lower threshold in terms of the overall financial resources that they devote. Now looking more at the successful companies that go public, it's highly unusual again for start-ups not to file patents pre-IPO in the two device sectors building on the earlier points. But it is increasingly common for the software start-ups to have patents pre-IPO. For failed start-ups that are disbanded, I think it's interesting to note that within the IT sector, both in semiconductors and software, that steep climb post-2000 in the percentage of failed

companies with patents. I think it raises the interesting possibility that this has increased the supply of patents available for the market, if you will.

Then my final comments are really some questions that I think are completely unresolved by anything that I have done and I would put on the table for others perhaps on the panel or participants. And the first question is: Well, how important really are failed start-ups in these markets for patents. I told you these patents exist. It's entirely possible that all of them basically were allowed to lapse. I haven't said anything about the share that were reassigned or sold to third parties. I would like to look at that, but I haven't done so yet.

I think it's also interesting to think about where that post-2000 shakeout temporarily boosted the supply of high-quality patents. I think that's interesting because it suggests that, you know, five years from now you may have a very different scenario than what we've been dealing with for the last couple of years, at least in IT-related markets.

The second point I think is quite important from a policy perspective and that is how important are these patents sales as a means for investors and entrepreneurs for

recouping returns to their investments. So I think that it's possibly very important, but I think, you know, it's very important to keep in mind that if these patents are basically sold in bankruptcy proceedings for fire-sale prices, then it's unclear to me how these markets for patents are actually stimulating the financing of these entrepreneurial firm activities.

The third question is, to my knowledge, we know very little about the incentives of patent buyers. It's easy to talk about these, this development of markets for patents as being about further commercialization and further development. I think that's fantastic, but I think it's also possible that companies are buying patents to enforce, getting back at some of these debates perhaps over patent trolls. And then also we have other motives for perhaps just self-insurance where there is a concern for having these patents being asserted against companies and, therefore, an attempt to acquire them, as was revealed to be the case with Novell's acquisition of the Commerce One patent discussed earlier.

And then finally one thing I think that this conference is excellent and well positioned to address is how have the recent legal rulings affected either the types,

or the quantity, or the quality, if you will, of these patents being bought and sold on these markets.

And then I think the bigger question of all is really what are the implications of those rulings on innovation incentives. So hopefully others on the panel will have perspectives on those issues. Thank you very much.

MR. SCHRAG: Great. Thank you very much, Rosemarie. You've raised a lot of very important questions.

Our next panelist is Bronwyn Hall who is a professor at U.C. Berkeley. We're taking advantage of the great wealth of resources available at Berkeley in this area. Bronwyn is a Professor in the graduate school and also Professor of Economics of Technology and innovation at the University of Maastricht in the Netherlands. She's a Research Associate at both the National Bureau of Economic Research and the Institute for Fiscal Studies in London. And as I'm sure many of you know, for many years she's been a prominent researcher on questions of innovation. And we are delighted to have her here with us today.

DR. HALL: So thanks a lot, Joel, for asking me again to speak. And is Rosemarie still there, or is she off? I was going to say hello to Rosemarie and give her a -

- I had her slides ahead of time, and I checked. It's an interesting fact. The three technologies that she was studying are technologies that are actually well defined by the SIC Codes. And so it's fairly straightforward to go to the publicly-traded firms and figure out what their patents to R & D ratio is and how many of them patent.

And it turns out that they look pretty much like these firms. And the variation across sectors looks similar. And it's also the case that patents for 10 million raised is actually quite similar to patents for 10 million R & D, which sort of tells you that most of the money they've raised is really the R & D money, right, and not something else, or they're patenting very intensively compared to the publicly-traded competitors in the same sector. It's kind of interesting. It's a benchmark that I think, you know, it's useful to look at.

So what do I want to talk about here? Well, first of all, I did want to apologize to the visitors for the weather, which I'm sure you weren't planning on this when you scheduled hearings on May 3rd in Berkeley, California. You are probably hoping that the weather would be nicer. My understanding is the weather is nicer in Washington, D.C. I have a daughter there, and I hear about it.

So I was going to talk about three topics hopefully quickly, which is why I'm not using slides. Nonpracticing entities, independent invention prior user rights, and some data issues or data needs which are related to the first two.

Originally I thought I might repeat the obvious, but I think I'll skip that, about why we want a patent system. I think most of you know why we want it. I think the main thing is to remember that stronger is not better.

Nonpracticing entities, people have a lot of different definitions for this and Rosemarie kind of hinted at the issue in her presentation. I am using a real simple definition which is a patent holder that doesn't practice the invention on which he holds a patent. There is a long list actually of benefits that you can imagine from the existence of nonpracticing entities.

First of all, from an economic point of view it allows efficient specialization and knowledge production. It allows firms that are good at knowledge production to do that and not be forced into doing other things they may not be as good for -- as good at. It reduces reliance on -- returns to scale or scale economies to protect your innovations and trade secrecy. In other words, we might say

that one of the features of the high-technology firms prior to strengthening of the patent system in, say, the mid-1980s, was a greater reliance on scale and trade secrecy and keeping things within the firm because that was the way you protected knowledge.

So one thing patents might be good at is -- and particularly nonpracticing entities might help here -- is favoring more competition in the knowledge area. Rosemarie's discussion was about this idea that it enables venture capital financing because you have this title to whatever the idea that the firm is prospecting -- the firm is, of course, isn't yet a producing entity so it's useful to have this title.

There is actually now a reasonable amount of empirical evidence that does indicate, both in Europe and in the U.S., that ownership of patents within a sector does speed up, maybe, your access to venture capital financing. In other words, there is some evidence that this is true, there's some empirical evidence.

The other argument which is an argument that theoretically is extremely correct, and I think it's an interesting question whether it's true in practice, which is that because you have this title the salvage value of a

failed dot-com, or some other firm like that that's basically producing intangibles, is now higher because they can sell off the IP if they fail. And, of course, there's huge amounts of uncertainty in start-ups. You don't expect them all to succeed. So it's perfectly legitimate that some will fail that have good ideas or have some piece of intellectual property that's valuable.

Given that you've increased the salvage value of such a firm, now you've made it easier to finance such firms *ex ante*. Okay. Now that's a clean financial economics argument, but the question is: How important is it in the behavior of both venture capitalists and firms. And the answer is: I really don't know.

There's also some empirical evidence that when you're in a technology that has stronger intellectual property rights you do get more technology licensing and you get earlier technology licensing. It gets distributed faster. Okay.

So now what are the costs, because -- costs in the sense of the social welfare costs or the cost to innovation of having nonpracticing entities. I think we all know that there's been an enormous amount of controversy over this, okay, controversy which I think is legitimate but I also

think is primarily due to a different cause than the existence of a nonpracticing entity. It's due more to the fact that we had a period, which hopefully is now coming to an end, when a large number of very dubious patents got issued in some technologies.

I mean, things have changed, you know. Rejection rates are up. There's various court decisions that make obviousness not as big a problem as it was before, et cetera. But there still is this long period.

And the second thing is that the bargaining strength in negotiations is probably too strong for any number of reasons, at least in some technologies, the bargaining strength of a patent holder relative to the patentee. I'm reviewing for some of you the things which you already know, but these are controversial assertions because you can find plenty of people who will say: In my sector it's working great and, you know, this isn't a problem.

So why do I think the bargaining strength is probably too strong? Well, the injunction threat is extremely powerful in a -- you know, but we have *eBay* but, you know, still we don't know yet. We haven't yet seen things play out long enough to know whether that has fixed

this problem.

Basically the story, of course, is that when you have a complex product, you know like a mobile telephone or, you know, any complex electronic product or even a complex software product that reads on many, many, many patents held by many people the injunction threat is way in disproportion generally to the technology embedded in a single part of this complex product.

Now it's possible, it's not impossible, that in some cases that even though it's a complex product and even though it has hundreds of patents reading on it that one of two of them are really, really the important one. But I think that's the exception rather than the rule. And so the threat of shutdown in the face of, you know, one out of a hundred or one out of 200 essentially puts a lot of pressure on a potential infringer to settle rather than to fight and possibly invalidate the patent.

We have considerable economic research by my colleagues here in particular -- I'm thinking of Joe Farrell, who's in the room, or Lemley and Shapiro, if Shapiro is not in the room -- that the low-quality patents, which is to say patents that might be invalidated if you reexamined them or had used a higher standard when issuing

them, that low-quality patents can be just as powerful for this as high-quality patents because of the fact that, A, there's free riding so people individually don't have enough incentive to invalidate a patent if they are going to benefit 20 other firms when they do it and, secondly, for the simple fact that there is a risk attached to that strategy. The risk is that you lose.

And the cost of losing may be so high, especially if you have this injunction threat -- I mean this was the -- in a sense Rosemarie and I worked on this in semiconductors. There it was clear that the injunction threat was overall for those firms, for the manufacturers in semiconductors, because the cost of investment in a plant was so high that you couldn't shut it down, even for a month without suffering serious loss.

The final story is -- actually there's another issue here that increases the bargaining power -- and this is an area where I think the patent reform bill has been coming and going on, I'm not sure where it stands now -- is the willful infringement issue, which is even if you think there is a good reason to believe you're not infringing, once you got the letter now you're liable for triple damages. And this is a very -- you know, the bargaining

point just went up again. I mean, you know, there's a whole list of reasons why there is too much bargaining power on one side relative to the other side.

The reasonable royalties principle -- this is a very interesting one. I'm going to tell you this, the facts that we know on this, because the facts we know are too limited and it's precisely for reasons I want to discuss later, the facts we know -- Lemley and Shapiro made a considerable effort to find out what court-awarded royalties were by technology in the case of a reasonable royalties principle being applied, okay?

Now this is extremely difficult because most of the time you can't find the settlements. Okay. They're not there; they're confidential. There's various reasons why you can't find them. But they did it on a small subset. And what they found was that the court-awarded royalties were on average 10 percent in electronics and 14 percent in chemicals-bio area.

Most of us would say: That seems too small a difference based on what we know about the technologies, okay, that there ought to be a bigger wedge between the electronics reasonable royalties and the chem-bio reasonable royalties. But, you know, you don't actually know how

selective this sample is. It's possible the only cases we see are the ones I talked about where, yes, there are 400 patents, but only two patents were important, right, in the electronics case. In that case, you know, you might get high reasonable royalties in electronics. It's just really hard to say because the data are really slim.

So that's all I wanted to say about -- I mean except for the one -- I could give you a couple of facts about nonpracticing entities. The evidence is fairly clear that patent case filings from nonpracticing entities have increased a lot in the last few years. Now that could be because there is a lot of technology out there to salvage, right? That's one of the things Rosemarie was hinting at. But probably it's also because this is a profitable business opportunity, and it attracts people into the business.

I have some numbers from a firm started by Dan McCurdy, who used to be at ThinkFire, now called PatentFreedom, which show that the number of new patent case filings by nonpracticing entities has basically -- since the late '90s it was about 50 a year and now it's up to 300 a year as of, you know, 2007, 2008.

Rosemarie and I have confirmed this pattern in semiconductors, but it's very preliminary work. And Josh

Lerner has a piece on patenting in the financial method sector. And there if you're a small entity and you own a patent, the probability of that patent is in litigation is greater than one. Okay, right.

Now most people don't think probabilities can be greater than one but, of course, a patent can be in litigation in more than one place. Basically they are being asserted by small entities against large entities in that sector very, very dramatically.

Independent invention. I'm aware of my chair here and I'm thinking maybe I'll have to close out, so I'll be fast on this.

MR. SCHRAG: We can even always return to it later.

DR. HALL: We could always return to it. But I think it's worth getting this out there, because...

Independent invention has been proposed by several people as a solution to this problem of inadvertent infringement when there are many, many minor patents covering a technology, not always clearly written. I mean those patents are -- you know, searching is not always an option here.

There is an obvious cost, independent invention

defense, right? I mean if we allowed an independent invention defense there is a discovery that looks like costly to me -- you know, lawyers can say better, but it looks like a lot of discovery to me -- to prove, right, or disprove independent invention.

However, there is a benefit which is the fact of independent invention suggests the invention was not nonobvious to persons having ordinary skill in the art, okay, if you can actually prove it.

Shapiro shows basically, using simple models, that the welfare is almost always higher if you allow independent invention defense, but that's fairly, you know, that's in a limited setting.

Mark Lemley talked earlier at one of these hearings, but I'm not sure that he talked about this. He has a paper in which he suggests four modest proposals, which actually don't go to full independent invention defense, which I think solves some of the concerns that you might have if you went to the full independent invention defense.

One of them is that only proved copying be considered willfulness, okay, not independent invention, you know, which kind of reducing, changing the willfulness

standard. Using prior user rights instead of independent invention, which is subtly different because it has to do with timing. Prior user rights is a subset of the -- it rules out the simultaneous invention problem.

Make simultaneous invention relevant for an obviousness determination when you get to court, if you're in court and you're litigating in this area. Take independent invention into account when deciding to issue an injunction. That should be one of the factors that comes into this qualitative court test of should I issue an injunction here or not. Okay.

So the final thing is data issues, and I'll just summarize. One of the reasons we don't have answers to a lot of questions is because the data is really hard to get, the data that we really need, economists really need. They really need to know values. So does everybody else, right, to do these, to do transactions. I mean when the markets for technology, to do transactions, you need to know the value. You need to have a way of estimating value.

The two things that we miss most are better and more consistent litigation data and the financial settlements in patent suits. Now that's asking for a lot. Would this cause settlements to happen before a suit is

filed, you know, to keep it out of the public eye? I wonder. Okay. I do think that you're relying on the court system; you're relying on public services to settle disputes that in some sense the public is entitled to know what the settlement was.

The second one, and it's more feasible I think it, is the financial data for licensing. If you're going to understand this market, you really -- and I'm not the first person to say this; lots of people have said this -- you really need to have some information on the transactions that take place.

Now the auction sites are helping here a little, because we're seeing prices coming off the auction sites. But, of course, you have a large amount of licensing going on where you really don't know what the terms are. And it struck me that -- and especially this is an FTC hearing -- you know, mergers are reported at a certain level. Alliances are reported at a certain level. Why not require reporting of another arms'-length transaction in the marketplace, which is a patent license, in some standardized way?

MR. SCHRAG: Okay. Thank you very much, Bronwyn, for those comments.

DR. HALL: Well, I want to take notes.

MR. SCHRAG: You put a lot of issues on the table, and I'm sure the people have a lot to say about them.

Our next panelist is going to be Henry Chesbrough who is the Executive Director for the Center for Open Innovation at Haas. It's not surprising he would be the Director of that Center since he literally wrote the book on open innovation. His work on this new paradigm has been widely recognized for its important contributions.

So, Henry, maybe you wish to swap places so you can do your slides.

DR. CHESBROUGH: Sure. That would be great.

Well, it's great to be here with old professors, current colleagues, and the rest of us here. I'm going to focus my remarks probably at a little bit more of a granular level than Rosemarie and Bronwyn by going more to an industry view as opposed to a societal view. But the things I want to talk about here I think echo nicely the points that were made in the last two presentations about enabling markets for knowledge, the role of specialization that emerges from that. And I think you'll see that in the data I want to share with you.

Joel mentioned this idea of open innovation.

Shall I do that? Does that help?

A representation of an industrial R & D process in a firm for many, many years could be taken to be something like a funnel or sometimes you hear this called a "pipeline." And the imagery I think it's quite revealing because whether it's a funnel or a pipeline, it's a solid object that conveys flow through a process so that nothing gets in and nothing leaks out.

And you think about the firm that Alfred Chandler, a business historian at Harvard, wrote about, or if you think of Bell Labs and communication technologies in the 1960s, and then Western Electric, the Bell system, and all the Bell operating companies around the country, you can all get these representations of a very, very deep but essentially inwardly-focused model of innovation and R & D.

And it was at some point that much of this was done in the research organization, and then after a certain amount of development things were handed over to the development organization that was going to take this to a specific market. And that developed new products and new services that got out to the marketplace. And I'm leaving out of this slide all the stuff that goes through channels and distribution out to the market. That's also important,

but I suspect less so for today's hearings.

For a number of reasons this model I argue is less and less appropriate in most industries, and I don't have time here, although there is a lot of stuff in some of the stuff I've written about what would be behind that, but I think you can better understand innovation today in most industries by thinking of it as an open process where now we've got holes in the funnel so that things are flowing in and flowing out throughout the process, not simply at the very beginning or the very end. And this gets back to these ideas of specialization, knowledge production, thinking of this as a relay race as opposed to a marathon, if you wanted more of a colloquial metaphor.

And so ideas can come from both inside and outside at the beginning of the process. And they can proceed to market through the company's own channels, own business, own business model, or they can go to the market through others' channels and business models, et cetera. So there are many ways into this innovation process in this model, and there are many ways out to the market from it, as well.

And the rest of the time -- this is important, I think, if we're talking about intellectual property, because intellectual property can enable this division of the

innovation labor and allow this relay race to go forward without the baton getting dropped too often.

Some data that Rosemarie -- to give some context to Rosemarie's remarks about start-ups is to look at where R & D spending is occurring in the U.S. economy. And these are data from the National Science Foundation based on surveys, so there's always a lag in when these are reported. But this is organized by the size of the company doing the spending, so each of the numbers in these columns add to a hundred percent.

So, for example, in 1981 70 percent of all the R & D spending in the U.S. was done by companies of more than 25,000 employees, obviously very, very large companies. In that same year less than five percent of that R & D spending was done in small companies of less than a thousand employees. By 2005 those numbers had moved quite a bit. The large companies haven't gone away, but they're now just over 37 percent of R & D spending in the U.S., and those small companies of less than a thousand people are now more than 24 percent of R & D spending.

So one way of looking at this is that from 1981 to 2005, most of the growth in R & D spending activity has been not with the large companies but has really come from the

small companies. And to a lesser degree, if we looked at patents, we'd see a similar trend but less so. If we looked at jobs, we would see a similar trend as well.

So it's important to understand that the playing field which back in that closed model really favored the larger companies. I think this more level playing field you see in 2005 is more consistent with this idea of a relay race, or specialization, or a lot of participants going on.

And then just to talk to semiconductors, because we've talked about that a lot today and I know other panelists did as well, I want to talk us through how that evolved as an industry. There was a time when those first semiconductor firms -- and I'm thinking of the Bell Labs, the early days of IBM, and others where if you wanted to build a semiconductor, you had to build the system that used the semiconductor as well. There really were no independent markets. Those were all part and parcel of the same thing, because you couldn't really partition the technical design, and there were no standards for what the functionality of one ended and the other began.

One other thing was that companies like Intel actually launched with the birth of the company in 1968, was a second so-called independent device manufacturer or IBM

business model where they actually went after main memory components in IBM system 360s and basically were making replacement parts that were, you know, 10 times faster for less money. And they didn't have all of IBM's marketing assets, but they had a better technology. And there were enough systems out there and Intel was able to figure out enough about how those systems worked that they could plug in their memory and substitute for that.

And companies like Texas Instruments and others began to follow this model. But inside the chip it was still all vertically integrated. Intel did all the design, all the manufacturing, and all the rest.

In the 1980s that model evolved yet again, in Taiwan this time with ITRI, a government national lab, and a company called TSMC or Taiwan Semiconductor Manufacturing Corporation. And here for the first time the manufacturing of the chip got separated from the design of the chip. So we talk about how much money it takes to run a fab. Bronwyn mentioned this in her last remarks.

There's also a lot of money to design chips as well. But with this separation of manufacturing from design we saw a great deal of entry in the late 1980s and early 1990s of design-based semiconductor companies, many of which

were in the U.S. and many of the patents that you're seeing in semiconductors come out of this period where these design companies are going to outsource the manufacturing, receive the chip back, and then sell their products into their markets.

So as we look at these patent data over time it's actually very important to understand the underlying context of these business models, this partitioning or division of labor, because the business models aren't static in these periods. The period that Bronwyn was referring to about trade secrecy in economies of scale matches well to the closed manufacturers who do the whole thing inside.

But if you're going to be actually using multiple foundries and this competing on your designs it's a different story. And if you roll forward to today there is much further specialization in this industry where you now have companies that have specialized intellectual property for chip design, or other companies who specialize in IP for manufacturing, process technology; others that will do verification and testing methodologies for you. And, indeed, all of the entry in the semiconductor industry since the early 1990s when the Koreans came into the market, all of the entries since that time has come from the specialized

entrance doing specific pieces of the overall semiconductor task rather than an end-to-end manufacturer doing the design, the manufacturing, the construction, and testing, and so forth, all under one roof. Even companies like Intel today, their new Atom processor that goes for those net books that they have, that's actually being built by TSMC.

So one of the things we see here is that specialization promoted entry of new companies into the business at a time when capital requirements were rising as fabs were getting more and more and more expensive. If we hadn't had the ability to enable this kind of entry, it would have been a very, very tight oligopoly with only a very few companies able to afford the massive multi-billion dollar investments to do this. But with the discovery of the foundry methodologies and then the more recent further specialization, the cost of getting into the business is much lower, provided you only tackle that one specific piece of the business.

And I think, indeed, companies like suppliers to the industry, like Applied Materials, are adding more value with their equipment, which makes it easier for smaller firms to get started. Companies like TSMC now have something that -- their words, not mine -- they call an open

innovation platform where they essentially provide a whole suite of intellectual property services. So you can kind of have a turnkey if you use their tools and their approach and this platform, you can build the chip, and they will actually guarantee you a first pass-through successfully, because you've done everything that complies with all the stuff they have internally. So it's a story of increasing specialization over time. So as you see these time-trend analyses in semiconductors, keep this kind of history in mind.

And then briefly I'll do something in a lesser detail in pharmaceuticals, because we also see that industry as well. And here I would argue, although we're in an earlier stage, we are also seeing increasing specialization of innovation labor in this industry, in part because the so-called blockbuster business model has really broken down. There just aren't enough multi-billion-dollar targets out there for companies to go after any more. The markets are getting smaller for each individual compound. The innovation models are going to have to become more agile and more open for companies to respond.

So, again, in the beginning, whether it was from the lab all the way through to the patient, it was all done

in one company. So companies like Merck were the paradigmatic examples of this. But we see specialization emerge again typically in the 1980s with the biotech industry, companies like Genentech in the late 1970s really being forerunners in this.

Also clinical research organizations outsourcing clinical trial development, acting a little bit like foundries did in the semiconductor example. We have a lot of companies supplying tools and instrumentation, therapeutics, diagnostics, things that go alongside these drugs.

Universities here are playing a really important role at the early stages of these. So one of the things we haven't talked about yet is the role that universities are playing in these technology areas. I know Carol Mimura was speaking here earlier. She and I are working on something to try to advance the argument that universities also ought to be more open in their policies toward getting things out of the universities into industry as well.

And the final point to make here that we don't see so much in semiconductors is that intellectual property needn't be an all-or-nothing thing. There's a great deal of contracting in pharma by what's called "field of use," where

you have the rights to the drug in one area, but I retain rights to that drug for other areas.

And one recent example out of Berkeley that demonstrates this, I think quite nicely, is a company called Amyris that partnered with the Gates Foundation to develop some therapies for malaria, to treat malaria overseas. And they put all of that IP in this, I think it was OneWorld Health, to go commercialize it. And Amyris created some of the enzymes that could actually be used to produce this vaccine. But they kept the IP rights for other applications of these enzymes in other areas. And now they're actually pursuing a commercial opportunity in biofuels in the energy sector. Same IP, different application and a different way of carving up the intellectual property.

One area that I wanted just to bring up because once in a while good things happen and we sometimes don't recognize them. I personally think that the patent renewal fees have been a big policy success. And maybe we don't give enough credit to whoever made that happen, but we have a lot of evidence in the literature, and I'm assuming you probably know it so I'm not repeating it here, that most patents that companies do take out are neither used internally nor licensed externally. So they essentially are

on the shelf, if you will.

Well, one of the nice things about renewal fees is that it encourages companies to fish or cut bait. I can think of more graphical metaphors, but you get my idea. If you're not going to use it and we're giving you a monopoly that allows you to exclude anybody else from using it, let's at least make sure it's worth keeping this patent in force. And so by charging renewal fees, we kind of encourage companies to make sure they're serious about it. And I think over time we clean up some of the mistakes or those dubious patents that might have come out early on.

And, of course, when the renewal dates come due, often if you're planning to not continue the patent yourself, before you abandon it you might actually think about, well, gee, I wonder somebody else might want this. And that might be a secondary market that we can actually begin to encourage.

Now I want to echo what Bronwyn said about the lack of information here. It isn't just lack of information for economists and policymakers. There is also a lack of information for people in the industry trying to make these choices. They also don't have good data on what these things might be worth and what they might be able to expect

if they did this or that course of action.

So the actors themselves I think need a great deal more, and I would like to echo that I think that U.S. PTO when we do, for example, reassign patents, that's an opportunity to publish more information. If there are transactions being done and reported, that's another opportunity. A third one I would say is with all these court filings and settlements that are sealed, after a certain interval, say, five years, open them. And five years have passed, whatever commercial sensitivities are there are presumably pretty minor at that point, and although we'll have the five-year lag of what we're able to see, we'll see a much better picture with the five-year lag than we currently have today.

The final points I want to make are just all the things that are going on in industry in this environment, all the policy experiments at the business level -- I don't mean public policy; I mean private firms. The biggest nonpracticing entity that I know of is a company called Intellectual Ventures. I suspect you're well aware of them. They have been very reticent to share their own information, but I hear through secondhand sources so unfortunately I can't give you citations to this, that they have a very

large patent portfolio; a lot of capital; have done a lot of licensing deals, some of which have been made public because they are big enough to be material. There was one deal with Microsoft early on. I think it was at $80 million. Another deal more recently with Verizon. I think that figure was $265 million. So these are major licensing activities.

You had John Amster from RPX, so he probably did a good job of explaining what they are trying to do. In part it's something of a response to the Intellectual Ventures model. We already mentioned patent auctions of Ocean Tomo. We're trying to actually look at those data to contrast what the initial list price was versus what the actual transaction price was and, if we can get it, what the internal evaluation of the company was of that patent before it went through the process, to try to help parse how that actually went through.

And I guess the last one I'll mention -- I don't know, Rob, if you're going to talk about it -- is the Merck Gene Index, which I think is another interesting aspect here. I think of this as preemptive publishing where, instead of patenting for the right to innovate, this was a case where Merck decided to preemptively provide a lot of research funding to universities for genetic markers, then

compile all that research output, and publish those data as a result of putting that in the public domain making that something that couldn't be patented and, therefore, giving Merck a commons from which they could launch their own investigations and discoveries without fear of being blocked by some enterprising biotech that had a great patent on a particular part of the genome on chromosome 4. I don't think I'll talk more about that or not.

So what does this mean? And I think this is my last slide. I think this more open innovation process I began with requires both the buying and the selling of intellectual property. Unfortunately, those markets today are highly inefficient. And like other highly inefficient markets that means there are the insiders and then there's the rest of us. And, frankly, the insiders have a huge edge over everybody else. I haven't done the economics, but it's very unlikely to me that this is likely to be either socially optimal or even allocatively efficient. We can do better.

I think where we start to do better is through better information. So where can we provide more available information to try to reduce these price dispersions and information asymmetries between the insiders and the

outsiders. And I think we're already seeing in companies, and we'll see this more, preemptive strategies like that Merck Gene Index or others, where companies try to take into their own hands to try to give themselves some protection against the nonpracticing entities or the other challenges that they perceive in their environment that might hold them up. That's it. Thanks very much.

MR. SCHRAG: Thank you very much, Henry.

I think that we're going to take a very short break since we got started a little late. So we will reconvene at 20 after 3:00.

(Afternoon recess taken from 3:15 p.m. to 3:30 p.m.)

MR. SCHRAG: If people could take their seats, we'd appreciate it, so we can get the rest of the panel underway. Thank you very much.

So our next panel is truly needs no introduction here, I'm sure.

MR. MERGES: Thank you very much. I'll just start right there then.

MR. SCHRAG: You will?

MR. MERGES: If you want me to.

MR. SCHRAG: Oh, no. Our next panelist is that

Rob Merges --

MR. MERGES: Okay.

MR. SCHRAG: -- who is the Wilson, Sonsini, Goodrich and Rosati Professor of Law and an expert on all things related to intellectual property, so...

MR. MERGES: Okay. Even when I ask -- oh, there you are. Okay. See now you guys were all congregating back there, and I couldn't use my favorite trick that I use on students when everybody's not paying attention and they're all kind of wandering around. I always sidle up to the microphone, and I say: Now on the final exam... Boom. Instant attention, you know? Anyway. So no test, no exam today.

However, I am going to talk a little bit about the marketplace for intellectual property rights, specifically patents, today. I've got two main themes, and here they are: I am going to talk about asset definition and asset legitimacy. And if I have any distinct value added it's probably on that second point, which is really a lot of what I want to talk about. Okay.

So on the first topic of asset definition, you know the basic questions you want to ask when you're sort of evaluating a market is what kind of assets are being traded

and how do we establish their value. That's what markets are really all about.

The market for patents is sort of a complex beast in some ways. And that's because in reality there is sort of a complex relationship between -- you might think of three different levels of economic activity.

There is tangible assets. That's sort of the old smokestack and hardware-based aspects of our economy, which are still important.

Then there's information, and that's in many ways where the economy is going.

And then, thirdly, there are the legal rights themselves. And it's very easy to get level two and level three mixed up. Many people do. But it's important to know that there are information businesses and there are even information industries that don't have very much to do with legal rights. And, more to the point, there are transactions and information which are different from and separate from transactions in the legal rights that cover information.

And when you think about the economic consequences of the market for patents, you have to think about the effect of any regulation and the effect of any set of

transactions on all three levels. I'll try to explain what I mean by that as I go along.

The markets for these things interact in some interesting ways. That's really what I want to talk about. And what that means for my first topic is that the asset-definition issue here is a little bit complicated. Defining the asset that's being transferred takes a little bit of subtlety. It can take some nuance. And we have to be careful, when we're looking at an individual transaction, to really specify what it is we're talking about.

So, for example, here's a book coauthored by my good friend Ashish Arora. It's called *Markets for Technology*. And in this book Ashish and his coauthors summarize some research where Ashish sets out some findings to the effect that in many cases what we think of as a patent license actually has two components. There is a know-how, a trade secret, an informational component, on the one hand. And then there is the exchange of formal, legal rights, on the other hand.

And he finds that at least in some industries, at least for some transactions, the patent serves as sort of an anchor, or a placeholder, or a conversation-starter. And what really is valuable in the transaction is the

information that the patent in some ways acts as an anchor for, or that the patent facilitates transactions in, if that makes sense.

And I think that's a good example of the general theme I'm getting at, which is if you think only about markets for legal rights, you will miss the fact that a lot of important economic activity happens under the rubric of a patent license, but it's actually information being transferred. And we know in a lot of patent troll situations that what's bothersome about them is that, in fact, there is no information changing hands; it's strictly a legal relationship. It's strictly an agreement to make a lawsuit go away.

And what bothers people fundamentally is that the market for the legal right, which is the right to exclude, is not carrying along with it any underlying or fundamentally valuable information. So to some extent some of the complaints about troll transactions are really complains that -- what we have is a kind of bare-naked legal exchange and there's no valuable information changing hands at the same time. So I'm just trying to show that these markets are fairly complicated and they interact at different levels. Okay.

Beyond that, when we think about the market for patents, regardless of whether information is flowing or moving along with them at any given point, we have to think about how regularization is going to happen, how this market is going to evolve and develop. And one of the ways that markets evolve and develop is that the rankings, ratings, and various common denominators, rules of thumb, and other transactional efficiencies, transactionally-efficient earmarks, or transactionally-efficient indicators or facilitators come along. So examples of those would be Moody's ratings or the use of square footage in real estate.

These create comparability between assets which are not, on the surface, fundamentally comparable. The idea is that experts and people who look at large volumes of transactions can discern commonalities and can come up with common denominators that allow us to compare that which seems incomparable, at least at the outset.

This kind of evolution of rules of thumb, and ratings, and common denominators is just starting in the market for patents. One of the things that I think we have to be careful of is regulating at too early of a stage or in the wrong way, such that this market evolution is stunted or redirected in a fundamentally dangerous kind of way. Okay.

Another topic that is very relevant when you're talking about market making is transparency. And at least in this first pass through this topic that has taken the form of this question: Should the prices of patent transactions be made public? People sometimes differentiate between licenses and assignments or patent sales. There are cases to be made for a transparency requirement for either or both of those. The obvious benefit is you get greater comparability. There are gains for consumers, buyers of things, when market prices are readily available. I think that's pretty obvious from most commercial market exchanges.

That's why if you're in a tourist city and you're walking down the street most of the restaurants, which you don't know from Adam and you'll probably never go to again after that night, will not only put their entrée items on there but probably the prices, too. And if they don't that's sort of telling you something you might want to know, too. But, anyway, you get some comparability that way.

On the cost side, people have worried about whether or not a transparency requirement or a reporting requirement is going to affect settlement. We've heard about that today. People have talked a little bit about whether you would be able to regulate the terms of

disclosure because IP transactions are so idiosyncratic. So these are kind of the pluses and the minuses, okay.

That kind of wraps up what I want to say about asset definition, not that that's all there is to say. There's a huge amount to say. In some ways I come back to the question of the interrelationship between information and IP markets in a minute.

But I want to move on to my second topic, which is legitimacy which is something that lurks below the surface in a lot of discussions of the IP marketplace, particularly when people start talking about patent trolls. And I thought rather than letting it lurk in the margins I would sooner bring it front and center in what I wanted to say.

So the completely scary thing, obviously, is that, you know, trolls are a major, and scary, and serious threat if you're a manufacturer. That's my *Lord of the Rings'* reference for today. (Referring to the picture on the screen.)

MR. KLEY: Is that a manufacturer?

MR. MERGES: He makes people scared. So in that sense I suppose in a limited way it's a manufacturer.

So the basic point here is that society determines which transactions are legitimate and which are not. Here's

the main take-home point on legitimacy. The existence of a market does not by itself confer legitimacy. Okay. I just want to repeat that because I promised that's my take-home point. The existence of a market does not by itself confer legitimacy.

That's an implicit thought behind a lot of conversations you hear with respect to trolls, that, well, these are willing buyers; these are willing sellers. What could be wrong? Okay.

And my simple point on legitimacy is that that's not enough. You can't stop the conversation at that point unless you're in a group of committed libertarians who think that market exchange is the only value and that voluntary exchange is all that matters. Most people don't agree with that. For the most part society is much more, let's say, discerning. I'll give you some examples of markets where you have willing buyers and willing sellers where social legitimacy is very much not taken for granted.

Supply and demand for blackmail is a classic problem in the economics literature because you have a willing buyer and a willing seller, and it's taken people in economics and law in economics a long time of wrestling with it before they finally decided, well, this isn't a good idea

to have a market in blackmail, because blackmail is wrong; it's a bad thing.

Obviously slavery and various forms of indentured servitude is another example. Another example that comes up which is more in the gray area would be the market for body parts. This is a book called *Black Markets* here.

The point is that there is a spectrum of legitimacy and the fact that there's a buyer and a seller and that they are willing to arrive at a market price does not automatically mean that you're on the good side of the dividing line that divides that spectrum. Okay.

My simple point for the trolls of the world is they have to be aware of that, because the way the legal system works, it will first see whether there is a willing buyer and a willing seller, and then it will say: Gee, is this the kind of transaction we want to promote. That is to say, is this a legitimate asset being bought and sold? The fact that there's a market is not the end of the discussion. In some ways it's just the beginning. Okay. That's the simple point.

So how do I bring that back to the topic of asset definition and the relationship between particularly information and patents or IP rights? Well, here's the

simple point there. The market for patents should serve to facilitate the production of information or tangible assets and/or it should promote the progress of industry. That's the constitutional standard.

To put it really simply, the way we should judge the legitimacy of this market is to ask whether or not the transactions that the market facilitates are serving a goal or a purpose that we think is valuable. We say, "No," in the case of, let's say, markets for drugs or blackmail. I think there are definitely classes of IP transactions that do promote the progress of industry, that do ultimately facilitate innovation.

But figuring out the line between pure rent seeking and transactions that might facilitate innovation or that might attract capital formation for future innovation, that's what this whole venture in my mind should be about.

So to kind of bring it back to my starting point, the market for patents, I think, if it is in service an end that we think is valuable from a social welfare or social benefit point of view, to that extent this is a perfectly good, legitimate market and we ought to think about facilitating it and promoting it.

To the extent that the transactions that happen

under this rubric are really pure rent seeking and don't do anybody any good, to the extent that these transactions really don't encourage any real innovation, then I think the trolls of the world are going to find themselves increasingly in trouble, and under the gun, and increasingly under a regulatory burden, because that's what we do. If you're a complete on the wrong-side-of-the-line-type transaction, we outlaw you and life gets very difficult. And the way you enforce your rights is you shoot people or you hurt people. That's not an industry you want to be in.

If you're on a good side, we say, "Fine," you know, market transfer leading to socially beneficial results. You're fine. If you're in the middle that's also a murky place to be. That's like the market for body parts. We're a little squeamish about it. We tolerate it to some extent. We regulate it. We wring our hands about it. We say various complicated and nuanced things about it.

If you're in that kind of a market, obviously we want to set up a set of regulations and incentives that pushes you over on the positive side of the line as much as possible. And I think the reason we want to do that is, again, the transaction isn't serving a socially useful kind of an end and there really is no reason to promote it;

there's no reason to encourage it.

Just a quick summary of a couple of things that have been said here earlier. I would say that Rosemarie Ziedonis and Bronwyn Hall were talking about some very interesting issues, which I think are whether or not the exit strategy or salvage value of the IP portfolio of the start-up feeds back in any meaningful way into the original funding decision. If it does then, in my terms, the market for salvaged IP ultimately is going to serve some pro-innovation purpose, because it's creating a little more of a positive payoff for the funding entity.

If, on the other hand, most of the salvage IP is being bought on the cheap and none of the founders or funders ever see anything from it, then I can't think that it's serving anything but a kind of rent-seeking function.

And then I think the interesting question is a dynamic question whether over time the people holding salvage value IP will get more sophisticated and whether they'll drain some of the rents from the middlemen and start to create more of a salvage market themselves.

Anyway, these are interesting, dynamic questions. But in my mind it all comes back to this basic point, which is: Are these transactions facilitating innovation, real R

& D or not? A little birdie just told me my time is up, so that's it.

MR. SCHRAG: We planned that. Thank you very much, Rob. And I think we're actually done with the projector now.

Our final presenter this afternoon is another person who in the IP world probably needs no introduction, that is Marshall Phelps. Marshall is currently the Corporate Vice President for IP Policy and Strategy at Microsoft, where he has global corporate responsibility for these areas. Prior to that he was Microsoft's Deputy General Counsel for IP. And before joining Microsoft he had a 28-year career at IBM, which included serving as Vice President for Intellectual Property and Licensing. And Marshall also has a relationship as Executive-in-Residence at the Fuqua School of Business at Duke University. And so it's entirely appropriate that he's on the academic panel.

DR. PHELPS: I was trying to figure out why I was on the academic panel for the longest time. I'm not going to use a PowerPoint, which for somebody from Microsoft is heresy of the highest order, but I thought I'd just take five or six minutes and just give you a couple of quick thoughts about this.

I would like to echo some things that we've heard before -- and this could be very dangerous with this bird flying right over my head -- about a different way to think of the markets for intellectual property beyond the way most executives, accountants think about intellectual property and what to do with it.

The traditional way that intellectual property is taught is that it creates a negative right. It's the ability to stop somebody from doing something. And my classic story, which some of you have probably heard, is Lou Gerstner arriving at IBM which, give Lou a lot of credit, he saved the company.

But in 1992 IBM was down to a hundred days of cash and it was about to go bankrupt. And it would have been the largest bankruptcy -- we since succeeded it greatly, but at the time it was going to be the largest bankruptcy in U.S. history. And Lou arrives from Nabisco. Now what does Nabisco do? It makes crackers and cookies. And Lou had just lost a patent struggle with Procter and Gamble. There's a great book written about this called *The Cookie Wars*. And it was over a patent for making soft chocolate chip cookies. And he lost. And so Nabisco was out of the soft chocolate chip cookie business forthwith.

And so he arrives at IBM and finds out that there's this guy named Phelps who's out there licensing everything under the sun at IBM. And on his second day calls me up and starts screaming at me, you know, Lou, he doesn't know what to do. He said, "What the hell do you think you're doing? You're out there licensing this stuff when we should be stopping our competitors."

Never mind that we had a 1956 consent decree that required us to license this stuff. But, you know, that was not a good example to try to explain to Lou in an irate phone call.

So what we did was we took one of these laptops and we pulled off the keyboard and we made little red flags out of toothpicks and we put it on the intellectual property of other people in an IBM-architecture machine, which should be our strongest, as you would think, our strongest platform. And we stopped at 150 flags because we ran out of real estate, not because we couldn't have found other intellectual properties.

So the point was, Lou, we have to use the technology of other people in the high-tech ICT industry, if you will, if we're going to be successful going forward. That kind of thinking, by the way, leads you pretty quickly

to this kind of a thought about open innovation, if you will, to pick Henry's terminology.

And I got thinking about that because most of the licenses we did at IBM in the 10 years that I ran this function were really combinations of trading. They weren't just straight intellectual property in the sense of patents. There were an awful lot of pieces of R & D, of trade secrets that went in those things, and then the patents dragged along as the right to use them.

And, by the way, that creates a dynamic when the company on the other side can go to their CEO and their board of directors and say: Well, we're also getting a whole bunch of technology here, folks, that we don't have to pay for. My classic example of this was the biggest deal that I ever did. Back in the mid-1990s IBM invented a way to put copper and aluminum on a chip at the same time. Well, copper is highly corrosive and theretofore you couldn't do that. Well, IBM figured that out. The only problem with it, it costs three to five billion dollars to build a plant to do that. And, of course, IBM was cash-strapped.

So the day IBM announced that they also announced that they had two licensees, their two biggest competitors

at the time: Motorola and Intel. And basically IBM got a free facility out of those deals. Now the beauty of that -- and this is the way you have to think about this -- the beauty of trading intellectual property like that for something is that IBM was, at that point in time, working on the next generation. Intel and Motorola weren't. They were trying to get to square one.

So, anyway, my point is at the next turn of the crank, who do you think the first people back to the well were? Intel and Motorola. So it's sort of created a *de facto* standard in the chip-making industry for this kind of technology at the time.

So this was kind of the discussion I had with Bill Gates back in 2003 about how Microsoft kind of needed to rethink itself on these kind of things and quit being this regional Seattle company thinking it made more money than everybody else in the world, *a fortiori*, they're the smartest and everybody breathing the same exhaust on that one giant campus up there in Redmond, Washington, and start to look outwards.

And the way I explained it was that you ought to think about this stuff as a virtuous circle. You spend money on R & D. Out of that comes intellectual property.

You use the intellectual property to either get licensing revenues or build relationships and that feeds back into the R & D model, and you just keep going.

In the meantime, you've created a subsequent or subset ecosystem with the intellectual property you've put out there in the open world. That was kind of my homely example of the thing, and I used to draw these charts all the time. Bill bought that. Bill Gates bought that, being one of the smartest people that I've ever met in my life and certainly highly knowledgeable about intellectual property. He thought that was really a pretty good idea.

And so we have been working since that time to kind of change Microsoft from being an inwardly-focused, negative-rights company with intellectual property to be an outward-focused, license all your technology. And in December 2003 we came up with a plan of business. So we are now open for business. We will license everything that we have.

So we started down that road. We put 50 technologies on our website, and we said come and get them. And nothing happened. We learned a very powerful lesson. And that is you just can't throw technology out there and expect it to succeed. If you really want it to succeed you

had to build an infrastructure around it. So we set up something called Intellectual Ventures, and that crowd -- IP Ventures, excuse me -- and that crowd --

(Laughter.)

DR. PHELPS: That's a Freudian slip of some significance.

(Laughter.)

DR. PHELPS: That crowd, what they do is they will find venture capital. And sometimes it's our own. They will find managers, professional managers, because, believe it or not, propeller heads sometimes aren't the best business managers in the world. They will find technologists to go with the technology. And they will start businesses on the back of that. And I think we've started something like 25, 30 businesses at this point in time around the world. And some have been very successful, especially the one in Ireland for reasons that, you know, Ireland is a terrific IP country, has been for years. And that's why all the writers were living there because their rights got protected. But Ireland has done very well. We've done one in Finland; we've done one in Sweden; we've done three, I think, in China. We've done them all over. We've got a bunch in the United States.

So that is a case of making a market for intellectual property rather than have the stuff sitting on the shelf, because I can tell you, even if you spend $9 billion a year on R & D it is not an organized process. It is sloppy. It is, you know, everything you want R & D to do. You don't know what you're going to get out of it when you start down the path and things will diverge.

But what I was trying to avoid is what happened at IBM, where we would invent something -- and I was just talking to Henry about this -- reduced instruction set computing. It's called RISC for those of you who are long in the tooth and remember that kind of stuff. It sat on the shelf at IBM rather than compete with the mainframe computers that IBM was building. And, of course, the biggest argument against that was brought by the sales forces who said: No, we want to sell these big mainframes. We are not interested in selling, you know, reduced instruction set computers which are simpler and cheaper. We want to sell these big heavy things. So that's what I was trying to avoid at Microsoft.

So I guess there are a couple of quick lessons I'll just give you real quickly. I view IP not just as a negative right, as I said. It certainly is that. And there

are times -- and you heard Horacio say we've had three instances where we had to assert that. I should tell you, and I don't -- the reasons we had to assert that was because we found three companies who wouldn't even talk to us. And that's a tough situation to find yourself in. And so that was -- if we could have entered into negotiations none of this would have happened.

But I view, in addition to the negative right thing, which everybody on the planet focuses on, you ought to look at intellectual property as a pretty good bridge to collaboration. Now why do I say that? I say that because if you don't have IP rights that are understood by the purveyor of them and the receiver of them, you don't have the necessary scaffolding to build a good, good bridge there between the two sides. So IP rights are really important that everybody understand them, so that if I'm on the receiving end I know what I'm getting and I know what my rights are to use what I'm getting.

If I am the giver of those or the seller of those, I know what my rights are and what my ability to enforce them are if something goes wrong and what I can expect on the other end. That's really important in commercial transactions. And I would urge the Commission or anybody

else to take that into account, at least the second order effects of what might happen if you try to limit that kind of capability on either side.

I wanted to say something that I heard a little bit about today. This is not a trend limited to the IT industry, what I'm talking about here today, even though it's probably most profound in the IT industry, because our products are made up of thousands and thousands of inventions. Windows Vista has 50 some odd million lines of code in it. You might argue there are a few too many. Some have. But there is a lot of invention, a lot of invention that goes in there.

And you say, well, that's okay for the IT industry, but it doesn't apply to my industry. Okay. What's your industry? Big pharma. Well, it does apply to big pharma. Big pharma is in deep trouble for the business-model problems that you heard earlier. What are they doing? They're trading IP on the front end. They're running around trying to find small companies that they can buy and do the R & D for them so they can fill up the pipeline, because there aren't just that many more $1 billion pipelines.

So if you look at Eli Lilly, they went and bought a company that was making Cialis. Well, Cialis is that one

where you see the man and the woman in the bathtub on the mountaintop, just like home for me. I don't know about you guys. But Eli Lilly had a great marketing engine. Icos, which is the company that made Cialis, had a good R & D engine. And they put two and two together, and the pipeline got a little bit fuller.

If you think about the airplane industry just for a minute, think about the 787 that Boeing is building, if they ever do build it. The wings are being made by Mitsubishi heavy industry in Japan. The fuselage is being made by an Italian company. They are assembled in someplace in South Carolina. They are put on a 747 guppy and flown into Everett, Washington for final assembly and test.

Now we all have to hope that there is a lot of intellectual property being traded on the front end so that we know that the wings from Mitsubishi and the fuselage in Italy work together pretty well. Otherwise, we're all going to have a very unhappy flying experience.

So my only point is about this is this kind of stuff is going on in lots of -- I can give you chapter and verse on this, and I won't bother. But just some results.

When I left IBM we had 1826 cross-license agreements around the world. Those are 1826 companies that

don't sue each other basically, is what happens. Since we started this in Microsoft we're now up to about 550 cross-license agreements, some with, people would argue, arch enemies, like open-source companies like Novell and things of that nature.

So I can just tell you that that is a pattern in the industry that is going on left and right. And so for those who view this intellectual property stuff as building barriers between companies, I would argue the opposite is more likely the case than not. What else did I want to say? Well, I think I've said it all.

Just the point is, I do think that IP is this incredible scaffolding that allows all this to work. Does that mean there aren't problems, that we get out of sync, the patent system gets out of whack on occasion and needs to be brought back? Yes, it does. It means we have to do all those things and, you know, eternal vigilance is probably really, really important.

So I just wanted to say one thing about the troll problem, whatever. The one thing we are ignoring in this is a lot of these trolls happen to be law firms. And what they do is they go out and they buy these patents. Now I suspect that I'm the number one victim of trolls in the world. It

is the deep-pocket theory of justice, and we should never forget that.

When you combine that problem with very, very friendly plaintiffs' jurisdictions so -- all but one of our patent-infringement cases are in the Eastern District of Texas, they are in Marshall, Texas. And they are there for a reason. And you can figure out what the reason is without me telling you. But that's kind of the situation. So that's an aspect of this, that we haven't begun to cover, is that: Do we have the judiciary in this country straightened out? And maybe there are some things that need to be done there as well, because that's a huge problem.

I'll just give you one funny story. A Philadelphia plaintiff, a troll, sued a Philadelphia company in Marshall, Texas. Now all the witnesses happened to be in Philadelphia. Those of us who go to law school would say, well, gee, can't you a forum non conveniens argument here and get the case transferred out? No, the chief judge of that district said, well, we have airplanes here, and airports, and we have barbershops, and restaurants, and why can't they do it here, anyway? And, lo and behold, it's there. Now there is some evidence that that may be moving away a little bit. But I just add that element into this,

because this is another part of the problem. And I'll stop there.

MR. SCHRAG: Thank you very much, Marshall, and thanks to all the panelists for some very interesting and provocative presentations. And, unfortunately, Henry has to leave us at this moment to go attend to scholarly business and teach a class.

So I think that, Marshall, what you were just talking about, this concept of IP as forming a scaffolding tool is, in some sense, resonant with what Rob was talking about in Ashish Arora's book, --

MR. MERGES: Right.

MR. SCHRAG: -- you know, the IP playing sort of a focal point. And I'm wondering what people's thoughts are about whether that fact that IP plays this role in sort of a broader technology relationship between the firms that are transacting. Does that mean that we approach technology markets differently than we approach markets, you know, for commodities and services where there are arm's-length transactions? Do we think about efficiency differently? You know, are there -- is it important to distinguish between markets in those different kinds of contexts?

MR. MERGES: Well, yeah. I'd say definitely yes,

for two reasons. First of all, the data that Rosemarie presented and Bronwyn alluded to a little bit, you know, that's data that shows that there are lots of small companies that hold patents. And a lot of that was directed at sort of the final-period problem or the exit-option problem. But when you sort of dig into the details of what Marshall was saying, which is: Why is it that it's easier to sell an idea, when you have a patent on it? Why does the patent part help to drive contracting, to put it that way?

You see that for various reasons. It promotes disclosure and a kind of openness and notice about what you have. So my point is it's not just that there are a lot of small companies with patents, but that patents really help small companies maintain themselves as idea factories. Patents are what allows them to be constituted as independent companies so that they don't get absorbed into bigger companies. It makes it easier for them to do what they do. You know, that's the first point.

And the second point is when you sort of think of that line between beneficial and detrimental IP transactions, you know a small company that plows the royalties back into the next generation R & D is pretty much the paradigm of what we're hoping to happen with the patent

system. Whereas, a law firm that buys up a patent in bankruptcy and that simply uses whatever settlement to, you know, distribute to the partners who bring the cases in Texas, none of that is ever going to find its way into R & D. I mean law firms don't do research and development. They do a lot of things, but they don't do that.

So, you know, I would just point out that, you know, there are small firms and then there are small firms and there are IP transactions and then there are IP transactions. And what we're about here is just beginning to get a sense of some parameters about how to divide the wheat from the chaff and maybe how to encourage some of the chaff to kind of migrate slowly over to the wheat side, the good side.

DR. PHELPS: Good. I would argue the *eBay* thing has probably been somewhat helpful here. But let me just explain to you how the other element -- how this works against a complicated product. Let's just take my Vista thing again.

Plaintiffs' lawyers will stand up in front of the jury and say: Ladies and gentlemen of the jury, we're just asking for 25 cents. That's all we're asking. Microsoft sells a copy of this thing for 60 bucks, 70 bucks, whatever

it is. What difference can 25 cents make to Microsoft?

Well, that makes a lot of sense, except when you multiply it by a couple of billion, which are the number of copies of Windows that have been out there over a period of time. And that's how you get these five, six hundred million, which we've had a bunch of these, judgments, million-dollar judgments against the company.

Now Apple is starting to find this problem, too, because now they're after the iPhone and the iPods and what's in those things that they can multiply by -- it's not the amount of money that you're seeking in damages, it’s the damn thing you multiply it by that is the huge problem here. So you add all these things up together and you see where the terror is in the system.

MR. SCHRAG: I should say that when I put out a question if anyone wants to -- you can indicate it just by raising your flag.

DR. PHELPS: Oh, these -- These guys?

MS. MICHEL: Rob doesn't have --

MR. SCHRAG: Yeah, Rob, your flag has migrated behind the laptop.

And, Rosemarie, if you're still on the line and want to interrupt us --

DR. ZIEDONIS: Could I contribute something before you move on?

MR. SCHRAG: I beg your pardon?

DR. ZIEDONIS: Could I contribute something before you move on?

MR. SCHRAG: Surely, please.

DR. ZIEDONIS: I would think that that last --

MR. SCHRAG: Yeah, just feel free to jump in when you want.

DR. ZIEDONIS: -- that that last discussion between Rob and I assume that that was Marshall --

MR. SCHRAG: Yes.

DR. ZIEDONIS: -- speaking last, I think that that illustrates a fundamentally important point that Rob, I think, really did a nice job of discussing, which is we have two, at least two, very, very different types of transactions on these markets. You know, one we can characterize as more that collaborative model where we need that scaffolding to, you know, get as the example that Marshall pointed out, the fuselage to match with the wings and et cetera, et cetera. And clearly that is vital toward getting new products on the market.

Now, on the other hand, we also have a fair

number, I would argue, of the troublesome, pure rent-seeking type of transactions. And I think, you know, when we talk about these markets for patents and whether they need to be promoted, or facilitated, or encouraged, I think that discussing that, keeping those types of transactions separate and discussing them separately is going to be very important.

I guess the only other point I wanted to make is that the study that Bronwyn and I had done on the semiconductor industry, we were looking back farther in time than the numbers that I reported and were looking at entry into the semiconductor industry through the early '80s until the mid-'90s. And our main question was whether that strengthening of patent rights associated with the Federal Circuit Court formation in the early to mid-1980s had an effect on the industry. And two points that came out of our study I think resonate directly with this discussion.

One is that we did document an unexpected rise in entry by specialized design companies, much in line with this kind of specialization in the industry and this furthering of these kinds of vertical transactions between these design companies and then selling off -- you know, relying on outsource production from manufacturers.

So that, I think, was a very favorable view of how in that case kind of this broad strengthening of patent rights may actually facilitate the emergence of these more technology-specialized companies. At the same time it was clear that the big companies, those that aren't just big but are trying to move forward in much the way that Marshall was characterizing -- complicated areas need inputs from all kinds of different patent owners, but they were highly concerned about rent-seeking types of transactions.

So I think that in some ways, even though our study was -- you know, it was published many years ago, 2001 -- about a specific industry, I think that these kinds of mixed results that we showed about patenting just in semiconductors is echoed in this broader discussion. Anyway, that was the main point that I wanted to put on the table.

MR. SCHRAG: Thanks. When a large corporation in a situation like that is worried about rent-seeking, is that an issue when they are initially screening people who are approaching them for technology deals? I don't know, Rosemarie, if that's something that you dealt with in your research, but Marshall may also have thoughts on it.

DR. ZIEDONIS: Actually I would appreciate asking

Marshall that in terms of how do you decide how many resources to put towards patent clearance on the front end and how effective is that as a form of quote/unquote insurance, if you will, against these types of disputes.

DR. PHELPS: I would argue it's pretty ineffective. Microsoft right now has 55,000 patents you either sitting in a -- pending in the patent office around the world or issued. Go ahead and try to do clearances on that. It's just huge. You can't know everything. Many of the people who are -- to use the term -- trolls, or nonproducing entities, or whatever you want to call them aren't exactly forthcoming until they kind of see where things are going, and then they can come and see you and say: Gee, sorry to hear you shipped 500 million copies of that.

So you don't necessarily find this stuff on the front end. Now I can search against Intel or the major Japanese companies. I can do that kind of work, and we do. We do. But it's the entity that has one patent sitting there somewhere that may or may not be relevant. And, oh, by the way, it may not read exactly on where we are, but -- and so the lawyers often want to say, well, you know, we don't infringe that thing. Well, you want to take your

chances on that in front of a jury of retired postal workers in Chicago, Illinois? I mean that's what you're facing. And they can confuse everybody with the technology behind these claims, and all of that kind of thing. So it's a huge problem.

MR. SCHRAG: Marshall, I don't know if you have a perspective on this, but is it your view, or anyone else on the panel, that this is a bigger issue, the clearance issue, in the IT sector, or does it apply -- Rosemarie talked about medical devices and --

DR. PHELPS: Well, it's much harder in my industry because the sheer numbers of or pieces of intellectual property that are in a machine. If I am in the pharma industry or the chemical industry, just to take two other high-tech things, I have a much closer relationship between the intellectual property and the ultimate product. Often one-to-one. I've invented a molecule, and that molecule becomes a blue pill, or a red pill, or something like that. But, you know, I've got 10,000 red pills in here. So it's a much harder problem in, I think, the telecom industry or the IT industry.

MR. SCHRAG: Yes, Bronwyn.

DR. HALL: Just a footnote on that. It's not just

the red pill problem -- I mean, you know, it's not just the one patent per product or the three patents per product and the, you know, hundreds of patents in my laptop, thousands of patents. I liked the red flags. That was good.

But it's also that those three patents are better defined, especially in the software area. I mean you have a better idea of what exactly they cover, particularly if you're using the old model of one molecule. I mean there it's -- you know, that's wonderful. In chemistry, the periodic table did a lot for us.

But in software, I mean, you know, -- first of all, the language changes depending on the period the patent's written. The language is sometimes tailored to get it into a class so it won't, you know, -- and then there's the problem of: Is it hardware or is it software? Well, most of these inventions you could do them either way, so then the language, you know, gets tailored to whether to making it hardware or making it software, depending on whether you're in Europe or, you know, whatever.

So I mean it's also the fuzzy boundaries, I think, you know, which -- you know, it's not news to us, but this is something that is worth reemphasizing. The fuzzy boundaries on the patents are also -- the problem is worse

in parts of ICT -- not all of ICT necessarily, but in parts of ICT than in the pharma area.

MR. SCHRAG: Is that an insolvable problem, or are there changes that could be made?

DR. PHELPS: This does lead you to some of these giant policy conflicts that you see in patent reform and whatever. If my whole business depends on that red pill surviving and not being copied, I am going to fight for as much terror as I can get into the system. I truly am, because my whole business is at risk if I lose that. Right. And I'm happy to have a Marshall, Texas sitting there. And I'm really happy that, you know, I can go for injunctive relief, and all of that kind of stuff.

But, boy, if I'm in the ICT world, I am not so happy. And that's why you see this giant battle on patent reform that goes on as we ask the government to choose among its children. And that is a really hard thing for the government to do.

MR. MERGES: Yeah, I would say that, Bronwyn, your point is very well taken. And I think we have -- there are some tools that we have to rein in the fuzziness with which -- particularly software patents, you know, that they are allowed to have, I think.

You know, we've gotten a long way away from a very kind of rigorous requirement that the claims be really proportionate to or commensurate with what you've disclosed. And very liberal amendment practice allows you to do what I call misappropriation by amendment. You know you wait till somebody does something, and then you amend your claims to cover it. That's the opposite of what patent law is obviously supposed to be about.

I think that the courts probably could use a little push in that direction. And I'm going to focus on the courts rather than Congress, because I don't think fixing an enablement doctrine is the kind of thing that patent reform can do, even if we ever get patent reform. But I think it would help for the courts to be aware of how the lack of notice, when patents are issued, plays into this whole process.

One of the critiques, you know, of patents in the information technology field is that you can't tell what they cover. And I don't think that that's -- there may always be some fuzziness, but I think we can do better than we're doing.

The other point that came up -- I forget who raised it -- is a very good point. And it addresses

Marshall's argument that many times it's the patents that have been sitting around for a long time, while the industry grows up, that cause the most problems.

And somebody raised the issue of renewal fees. And I think we've done -- I think it might have been Hank -- and I think we've done very little with that as a policy tool, but I think as a way to weed out patents that are really in a latent kind of a state, it's an underdeveloped tool. The trick is, the dangerous thing is, the downside is that small inventors and small companies will tell you it can take a long time to bring capital and to bring interest to their technologies.

So if you have a very aggressive renewal schedule that does not permit any kind of a wiggle room for a microentity, for somebody who really is an independent inventor, you're going to get all kinds of resistance just on a political economy front, and you're also going to run into problems substantively because you may be weeding out some very important small guys by requiring them to renew before the market has, you know, really been able to respond, and interpret, and react to what it is they've created.

So it's a really -- it's a very promising policy

instrument, but it's a lever that would require a lot of finesse to get it right, is my sense.

MS. MICHEL: But, Rob, could you just describe what you mean by using the renewal fees as a policy instrument?

MR. MERGES: Right.

MS. MICHEL: Are you talking about raising the fees --

MR. MERGES: Yeah.

MS. MICHEL: --

MR. MERGES: We've done very little with it. I mean, you know, there are all kinds of ideas you can think of along these lines. We have a very, you know, rough-and-ready approach now. We have certain fees so far in, and then they go up, and then they go up. But, you know, ideas like prepaying for the whole term if you think you've got a winner, prepaying at a discount, or putting it off if you're a little guy and saying: We're going to kind of, you know, get an option to renew at a lower price. And if we raise the money later, we'll pay the back renewal fees.

We haven't done anything creative with renewal fees. For the big corporate entity that just does it as a matter of course, raising the fees would probably have the

desired effect. It would cause them to weed out the weak stuff. But you can create a more subtle tool that doesn't capture or doesn't end up harming the little guy if you are creative about it, you know, allow him to put it off, allow prepayment at a discount. There's various -- I mean we just haven't done anything with that mechanism. Nothing creative, anyway.

DR. PHELPS: Which, by the way, is one of the reasons that patent reform never goes anywhere -- because the little inventors are scared to death of these kinds of things because they kind of have a back seat in this debate. So when you add the small inventors to the black helicopter crowd who think we're trying to undermine the competitiveness of the United States -- a bunch of people in Orange County -- which is true, by the way. I'm not kidding about this. It's what derailed patent reform back in 1992. It was a strange combination of Phyllis Schlafly and Ralph Nader.

But we've got to come up with an answer here --

DR. HALL: And the finance economists.

DR. PHELPS: Yeah. We've got to come up with something here that maybe we have a dual system. Maybe if you're small enough, you know, you don't pay the same fees

as everybody else. And we may have to do this so we can --

MR. SPEAKER: That's the right -- the right track.

DR. HALL: But we already do.

DR. PHELPS: Oh, but maybe -- what I am hearing here is we need to do more of that.

DR. HALL: Yeah.

MR. MERGES: There are more sophisticated --

DR. PHELPS: There are more sophisticated ways to do that. And maybe we have to do something that varies by industry a little bit, too. I don't know that answer. Maybe that's how you solve the pharma thing versus the ICT industry. Maybe you have slightly different systems. I'm not sure all that's bad. Although at some point in time you may end up with such a multiplicity you don't know. And the other problem with what I just said, if I thought about it, is the computer industry and the pharma industries are getting very close together, because almost all drug research now is done on computers. So we have to be somewhat careful here of what beast we give birth to.

MR. SCHRAG: Bronwyn, did you want to add to that something?

DR. HALL: Yeah, I wanted to -- I mean one of the slides I didn't show was the slide on renewal fees, because

I agreed with Hank and with Rob that very much that -- there's even -- you know, there's an old economic paper, a theory paper, by Mark Schankerman, with a coauthor, Francesca Cornelli, which basically shows that if you have uncertainty over the value of the patent which, of course, you do, which gets resolved, you know, it gets revealed as time goes by at different rates, that renewal fees can be a very good way to basically weed out the junk, because initially you don't know often. In fact, the earlier work by Ariel Pakes sort of shows that you get most of the information in the first five years or so, you know, of the patent life. But, of course, this could have changed since he did the work.

When I talk to my friends in Europe one of the features -- there is a good feature of our system, and the good feature is the lower prices for microentities. They don't -- this is a problem for them, because they have higher prices for patents, you know, overall, especially because of the translation fees. And they also perceive themselves as having a problem with new entrants, and start-ups, and so forth, in the high-technology area. And they've resisted having the multiple -- you know, having two tiers.

But it seems once you have two tiers, having two

tiers of renewal fees and escalating the renewal fees to get the junk out the system -- and not just the junk, but also this stuff you know we had with this -- after .com we have some patents that came back and bit people that were interpreted as -- you know, that weren't actually about the Internet but were interpreted as reading on inventions in the Internet. And it would get rid of that stuff, too, hopefully, you know, the stuff that comes back to bite you 10 years later when somebody reinterprets what it was they actually said. You know, if the patent's vague enough you can try to do that.

So I'm also kind of in favor of this renewal fee strategy, but there is a downside, which is that what you've just done is create a system -- if you tilt towards renewal fees, now you've created a system where there is this huge incentive to go to the Patent Office and get a patent, right, and make them do a lot of work for something that later on you're going to say, oh, after three or four years I'm not interested in it anymore.

Now that has the good side is that puts it in the public domain, which is a good thing, right? So now you've put information in the public domain, but you've raised Patent Office costs, because the money that -- where the

Patent Office is doing most of its work is in the application-to-grant phase, right?

So if you've tilted towards making the weeding-out come at renewal, you know, you've got a problem. So then, you know, people come up with these ideas of deferred examination, which is another way of trying to incent the same thing.

DR. PHELPS: But why couldn't you do both?

DR. HALL: You could.

DR. PHELPS: I mean it seems to me --

DR. HALL: Yeah.

DR. PHELPS: -- the renewal thing is kind of easy answer at one level. But I would still put the burden on the Patent Office on the front end so that we're still getting quality patents out of there.

DR. HALL: Yeah. My worry is that there is a limit to the amount of resources you can devote to the Patent Office.

DR. PHELPS: I agree. I agree.

DR. HALL: I mean, we are at -- you know, we know we are there --

DR. PHELPS: Yeah.

DR. HALL: -- and, you know, in the limit -- as I

said -- I've always said this is a self-limiting process, because eventually the Patent Office employs all the scientists and engineers in the economy, at which point people stop inventing, so it's, you know -- you can't go on forever.

DR. PHELPS: Good point.

MR. SCHRAG: I would be interested to get people's reactions to some of the issues that were raised on things that might be valuable for having a well-functioning market for intellectual property.

And, Bronwyn, that you talked a little bit about, you know, the questions of transparency, disclosure data.

And, Marshall, you may have a perspective on some of those issues, as well. So I'd be curious to hear your perspective as somebody who's operated in the industry, you know, what is the impact of increasing disclosure job what would be the impact, in your view?

DR. PHELPS: I think it's really hard, this push for transparency. And I'll just give you a couple of reasons.

One is if I have IP that I license to one person, not an exclusive license, let's just say. The next person who wants it, it might not be worth the same to that person.

It might be worth more. And so a price that I established in one case may not be the same price in another case, because the needs are different every time. That's part of the problem you face here. It's not like we're selling, you know, a pound of apples where everybody kind of knows what the parameters of a pound of apples are.

I go back to that chip model I made. The fact that it was worth an awful lot of money to Intel doesn't mean for another little chip company it's going to be worth that kind of money for a couple of reasons. And one is not the least of which is they couldn't pay it if they wanted to. So you have to be careful of that.

The other thing you have to be careful about, and this I would like to just kind of keep in this room, is most of these negotiations take place under confidentiality agreements between the companies for competitive reasons. Company A does not want its competitors to know that it has just licensed something, technology X, from Microsoft and that they're going to go into that business. So you sign these things up under a confidentiality agreement.

There is a third problem, and this is the big one. About two years ago the Internal Revenue Service decided it was going to take a look at these licensing deals the

companies do between themselves, try to value them, and tax them. What do you think the reaction to that was in corporate America? It wasn't good, let's put it that way. And it died before it ever got anywhere because companies were damned if they were going to have the IRS in there looking at licensing deals, trying to make the very same judgments we're all sitting here saying: Boy, is this hard.

DR. HALL: Could you clarify that a bit? I mean a licensing deal involves -- you receive money; it's in your bank account. You know, it's in your profits or not, as the case may be. So what are they looking for?

DR. PHELPS: Well, it's not necessarily that you receive money.

DR. HALL: So it's cross-licensing?

DR. PHELPS: It's cross-licensing.

DR. HALL: Oh, okay. So it's cross-licensing, --

DR. PHELPS: Yes.

DR. HALL: -- which is really tit-for-tat?

DR. PHELPS: No, no, no, no. No, no, no. Now most cross-license agreements have another component called a balancing payment that goes on.

DR. HALL: Yeah. But, again, that shows up in your bank account. It's --

DR. PHELPS: That's true.

DR. HALL: Yeah. I mean I don't see what the IRS is worried about. I mean, you know, it's --

DR. PHELPS: No, they -- they're -- look, it's --

DR. HALL: Quite frankly, I don't see anything -- I can -- income.

DR. PHELPS: It's any old port in a storm. They were just looking for another -- you know, another way to, you know, make additional money, they thought. But most companies did not want to disclose that competitive information to the IRS --

DR. HALL: Well, I don't -- I don't see why they should. It might be an auditing question. But -- but I mean but the money is income.

DR. PHELPS: Well, that's what every- --

DR. HALL: You know.

DR. PHELPS: -- that's what everybody argued. But they were looking at --

DR. HALL: Yeah.

DR. PHELPS: -- what's the hidden value here? And how do we tax that.

DR. HALL: On the idea that you're getting a free gift?

DR. PHELPS: I don't know what the IRS --

DR. HALL: I mean -- no. I mean, it just doesn't make sense to me. But, you know, I'm a dummy economist.

DR. PHELPS: Well, I'm happy to hear that.

DR. HALL: No, I mean, I -- you know, the IRS is a clever place, but, you know, I --

DR. PHELPS: It didn't make sense to --

DR. HALL: -- it doesn't make any sense.

DR. PHELPS: -- us either. But I can just tell you that the IRS is looking at this. I don't know if they still are, but --

DR. HALL: No.

DR. PHELPS: -- they were two years ago.

DR. HALL: They're -- they only issue I can see is the transnational -- the transnational transactions, there there's an issue, because you -- you do -- because of the different tax regimes.

DR. PHELPS: Um-hum. Right.

DR. HALL: Right? So you can see an issue there. But, you know, --

DR. PHELPS: You're talking about --

DR. HALL: -- within the U.S., I don't see an issue.

DR. PHELPS: You mean for transfer pricing issues or --

DR. HALL: Yeah, trans- -- there's a transfer pricing issue that -- that is serious, yeah.

MR. SCHRAG: And Bronwyn, I -- I get the impression that you -- you're relatively in favor of more disclosure. And what benefits do you see flowing from that in --

DR. HALL: Oh, well, there are two benefits. I mean, one is, of course, the selfish benefit, which is that people who study this area feel like they need to --

MR. SCHRAG: More data points.

DR. HALL: Yeah, we feel like we need to answer some questions. I mean, it's -- you know, I should say I study this area. I'm mostly unpaid studying this area, so it's not as if it's that selfish. But -- but it's -- we study this area, we'd like to, you know, we'd like to provide answers to some questions. And to do that you really do need values for a random sample rather than for a selected sample --

MR. SCHRAG: Right.

DR. HALL: -- that decided to tell you what the value was.

But the second reason is -- which has been argued by, among other people, Nathan Myhrvold, whom you may remember, is this idea that the markets will develop if we have better information, in general, about the prices of these transactions.

Now the heterogeneity is clearly an issue.

MR. SCHRAG: Yeah.

DR. HALL: The purer -- the pure size heterogeneity, okay? That's solvable about royalty rate. You rate -- I mean, you can -- if you set your royalty rate right then, the fact that this guy's selling 10 and this guy's selling 5 million, you know, you shouldn't be worried. But it's obviously much more subtle than that. It has to do with this -- the things that Rob talked about, which is the know-how, you know, the know-how you need for this, the market they have available is different from the know-how there, so the transactions are heterogeneous.

What happens if you make rules like this is firms learn to adapt --

MR. SCHRAG: Sure.

DR. HALL: -- but it -- of course, this is costly, right? I mean they learn to figure out ways to tell the guy who comes in and says: "Wait a minute. You charged that

guy this and I want that price," you know? And ways in which to make it clear that this is a different thing you're selling to them than you're selling to the other guy.

Now I thought Hank's suggestion on the settlements was very useful. And the same thing may apply to licensing agreements, okay? Because I think the deal killer isn't the heterogeneity, I think it's the negotiation -- it's the confidentiality restriction. I think that's a real issue which is in this -- in a sector like this, the secrecy when a firm is changing its strategy, you know, as to what the -- not Microsoft, but -- I mean, not the guy licensing but, you know, the --

DR. PHELPS: Both ways.

DR. HALL: Both -- maybe, but -- well, but, maybe both ways. But, like, Microsoft is sort of under a -- I mean, under a microscope anyway, so it's hard to keep too much secret.

DR. PHELPS: Well, not for -- not for licensing.

DR. HALL: Yeah. But, no, I was thinking more of suppose you license a technology to a firm that has decided to develop a product that the notion that they might want to keep that secret for a while --

DR. PHELPS: Um-hum.

DR. HALL: -- that seems to me a legitimate business reason. And so you might want to think also about delays in -- shorter delays, possibly, in revealing -- in other words, the -- having a lag in the revealing of the transaction, it seems to me, solves a lot of problems. And the settlements -- I was quite worried about the settlements until I heard Hank's suggestion, and I think that's actually quite useful.

DR. PHELPS: Um-hum.

DR. HALL: You know, waiting five years and then opening up the records. It's tricky because, of course, --

DR. PHELPS: Of course, if it's material --

DR. HALL: -- people will lobby for control over the opening.

DR. PHELPS: If it's material to one of the companies, it ends up --

DR. HALL: It ends up in the 10k, and that would --

DR. PHELPS: -- in the -- in your database somewhere, but you can move to redact the dollar figures in that.

DR. HALL: Exactly. How do you think we were worried about this? It's because where we get our data from

is 10ks.

DR. PHELPS: Sure, I know.

DR. HALL: Yeah, yeah. And so -- yeah. Because that's the one place you can find out a lot of things. Licensing contracts, I mean, Deepak Kagdes (phonetic) here, he's been collecting licensing contracts from 10ks.

DR. PHELPS: Um-hum.

DR. HALL: I mean, you know, information on licensing contracts.

From -- so there's -- you know, it's the redaction that's killing us --

DR. PHELPS: Yeah.

DR. HALL: -- and, you know, a delay would help.

MR. SCHRAG: So -- well, would you argue that having a limited amount of information about licensing contracts -- is that sufficient, or is that necessary to have the -- you know, the full suite of --

DR. HALL: I think this is very tricky to answer because the contracts are complex.

MR. SCHRAG: Um-hum.

DR. HALL: Right? I mean, you know, we'd like to know what the up-front fee is and what the milestone -- you know, what -- you know, what the royalty rates are, right?

But, of course, then the contracts get rewritten the be something very complex and so we haven't asked for enough.

DR. PHELPS: Let's -- well, yeah. Let's just pick on that for a second.

DR. HALL: Yeah. Yeah.

DR. PHELPS: Because, the -- most of the cross-license agreements go like this: It isn't that you have a stack of paper and a ruler and you measure how deep the stack is and you figure out what the differential is in inches and that's worth *x* dollars. What it's more like is I walk in there with my coal pile and you walk in there with your coal pile and you sit those two piles down and you say, "Aww, my coal pile is bigger than yours, therefore you own me money." And you say, "Ah-Ha. But in" -- "I've got another form of carbon inside my coal pile and I've got the Hope Diamond in there" --

DR. HALL: Yeah.

DR. PHELPS: -- "and it's worth *x* to you."

And that may be different in ever particular case.

DR. HALL: Yeah, I'm afraid I misled -- I'm being -- I -- we're talking at cross purposes here. Because I was not talking about cross-license agreements, --

DR. PHELPS: Right.

DR. HALL: -- which I view as stand-still, you know, in the mutually assured destruction game. And that's a different game.

DR. PHELPS: Um-hum.

DR. HALL: We know that game is there, it hasn't -- it isn't the thing that's causing the trouble. It's raising transactions costs for firms, --

DR. PHELPS: Um-hum.

DR. HALL: -- but it's not the thing that we're most concerned about, which is the nonpracticing entity activity.

DR. PHELPS: It's still not, right.

DR. HALL: I was talking about one-way transactions, okay, first.

DR. PHELPS: Um-hum.

DR. HALL: Right? The cross-licensing thing which the semiconductor guys do too. I mean, the first thing that I found highly amusing about that game was that, you know, until I talked to the semiconductor firms about this mutually assured destruction strategy, you know, people had always told me, "Oh, you're just crazy because you're counting patents to measure some form of innovation." I says, "Well, yeah, but the semiconductor firms do it too.

You know? Because it's just too much trouble to do anything else."

DR. PHELPS: Right.

DR. HALL: But you do -- you do -- I assume you do the selecting patents.

DR. PHELPS: Of course.

DR. HALL: You know, "There are must good ones."

DR. PHELPS: Of course.

DR. HALL: Yeah. Yeah. Because that's what it's evolved to, I mean, at this point.

DR. PHELPS: Sure. Um-hum. Okay.

MS. MICHEL: Would transparency in the market help if the only data that were required to run is sales of patents rather than the licensing of them, and would companies be as hesitant to divulge that kind of information as they might be about licensing?

DR. PHELPS: If the sales of patents are so -- are so irrelevant to an IBM or a Microsoft or a General Electric that I don't see what -- what data you get out of that that would make any sense.

MS. MICHEL: Okay.

DR. HALL: The -- one thing that we can comment on here is something -- I think Hank -- I thought it was Hank

or Rob that alluded to this issue. The USPTO, on its website, has an enormous amount of information --

DR. PHELPS: Yup.

DR. HALL: -- which it puts there in an impossible-to-use way. In this -- in the following sense: If you want to know if a patent has been re-examined or, worse yet, if you want to know if a patent has been invalidated, you might think that looking at the patent bibliographic data would tell you that. But, of course it doesn't. What you have to do is go to PAIRS --

MS. MICHEL: Um-hum.

DR. HALL: Okay? And dig -- dig down through all the re-exam activity to find the certificate, okay? And see which claims got invalidated.

Well, you'd think the natural thing would be to have that -- if it's going to be a good search tool, right? The USPTO database, it should be in the patent record.

The same thing applies to the reassignment information, okay? That alone would be a big help to people searching, because right now, yes, the reassignment information is published in the gazette, you know, and so forth, and buried somewhere on the website. But it's not in the patent record.

And so there's a list of things like this which are actually available -- existing available data which are -- which the USPTO could do something about at some programming cost.

MS. MICHEL: Um-hum.

DR. HALL: I suspect it's not the programming cost that's stopping them, it's that firms don't want it.

MS. MICHEL: Well, --

MR. SCHRAG: Well, we have --

MS. MICHEL: If Rosemarie maybe --

MR. SCHRAG: What's that?

MS. MICHEL: Is Rosemarie there?

MR. SCHRAG: What's that?

Rosemarie, are you still there?

DR. ZIEDONIS: Yes, I am.

MS. MICHEL: Okay. Ask her if she has anything.

MR. SCHRAG: Rosemarie, did you have any thoughts you wanted to contribute on this area, or...

DR. ZIEDONIS: The only thing I wanted to at least acknowledge is, you know, I don't know if this book came up in an earlier reference, but Jim Besson and Mike Meurer, their recent book on *Patent Failure*, I think, has, you know, reasonable arguments in favor of this kind -- we need more

transparency and greater notice. So just to be on the record, I think that their book is useful in informing this issue.

MR. SCHRAG: Yeah. They actually did testify in earlier sessions of the conference.

Well, we have gone over our time and we have several panelists who have been very busy and had to move on to their other obligations. So I think that unless Marshal or Bronwyn would like to make any final comments?

DR. PHELPS: No, nothing.

DR. HALL: No, that's enough.

MR. SCHRAG: We will -- we will adjourn for the evening. And we will be continuing tomorrow with panels on damages and remedies. And I should also mention that we are accepting public comments and we will be accepting them until May 15th. You can find a link for that on our FTC.gov website. And we certainly would appreciate any contributions you want to share.

Thank you very much.

(Whereupon, the hearing was recessed at 4:40 p.m., to continue May 5, 2009 at 9:00 a.m.)

CERTIFICATION OF REPORTER

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HEARING DATE: MAY 4, 2009

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I HEREBY CERTIFY that I proofread the transcript for accuracy in spelling, hyphenation, punctuation, and format.

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