

# Center for American Progress



**PRESENTS:**

**PUBLIC POLICY AND THE INTERNET**

**“THE WEALTH OF NETWORKS: HOW U.S. INTERNET  
POLICIES ARE UNDERMINING BOTH FREEDOM  
AND GROWTH.”**

**INTRODUCTIONS:**

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**SPEAKER:**

**YOCHAI BENKLER,  
PROFESSOR, YALE UNIVERSITY;  
AUTHOR OF *THE WEALTH OF NETWORKS***

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MR. CARL MALAMUD: Good morning. My name is Carl Malamud. Welcome to the Center for American Progress. I'm the chief technology officer here. I'm very pleased to be able to welcome Professor Yochai Benkler from Yale Law School.

Yochai Benkler has an interesting background. He spent a few years in Israel in the defense forces. Worked in a Kibbutz where he was the treasurer and came to the U.S., went to Harvard Law School and ended up clerking for Justice Stephen Breyer, and then went to a few law schools to teach. He went to – if I remember the sequence, it was NYU, then Harvard, then Yale and then ended up at Yale as a full professor where he is now.

Professor Benkler is in my estimation a stone-throwing radical. He has looked extensively at the internet, at open source, at a variety of things that are happening around us. And what he's done that has been especially significant is he's grounded these things that are happening in the real world in economic and legal theory. He's looked extensively at our classic economic theories, at the way we organize our markets, at the way we organize organizations and he has documented a third mode of production, something that's been happening recently and has been very apparent, which is people working together across organizational boundaries creating things like open source, creating things like Wikis.

This phenomenon is quite important because it raises some interesting policy choices that face us today and that's one of the things that Professor Benkler is so good at talking about.

So without any further ado, I'd like to welcome Professor Benkler to the stand.

(Applause.)

PROFESSOR YOCHAI BENKLER: Thanks very much, Carl, for the introduction and for giving me the opportunity to speak here. I'm going to try to speak for about 50 or 55 minutes and leave us about 30 minutes at the end or so for conversation, which I think will be useful.

The title of the book is slightly different than the title of this session. The book is *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, which is the book that I've just come out with. The emphasis I want to place here, particularly in the last portion of the talk, will be on how this translates into a variety of current policy debates that are going on the policy side in the wrong direction, even though society, market, and technology are all pushing in what I consider to be the right direction. And there's a deep conflict between the direction in which the political system, the judicial system, and the regulatory system are pushing policy, trying to squelch the direction in which market, society, and technology are pushing us.

But first, let's start with something a little different.

(Music: *The Times They Are A-Changin'*, by Bob Dylan.) (Laughter.)

So what on earth could it be that would lead a number of people to think of themselves in the tradition of all these radical movements organized around an operating system? This is part of the question that I want to answer today, and it's made up of two major components: the first is economic and the second is political.

In the first portion when I talk about economics, I want to try to explain what it is that is driving a basic change in the way we organize production and exchange of information, knowledge, and culture. And in the second part, I want to talk about how these changes in the basic way that we produce, the ways we know what are possible actions, what is available, what is on the political agenda, what is on the personal agenda, how that maps on to the basic questions of freedom and justice understood broadly as the concerns of more or less all liberal democracies. And I'll end up by talking about the policies that we in the United States today are focused on that have the effects of trying to squelch the economic shifts that are leading to increasing productivity online, but perhaps more importantly are enabling new modes of being free and equal human beings.

So let me start with an image. This is an old image. From 1835 to 1850, the cost of starting what was understood as a mass circulation paper went up from roughly the equivalent of \$10,000 in 2005 terms to roughly the equivalent of \$2.5 million. Now, the critical thing between starting something at \$10,000 and \$2.5 million is that you need a business model. You didn't need a business model before. There was a wider diversity of ways of organizing communication on a mass scale, but as the size of the relevant societies grew with industrialization, with transportation, the cost of reaching them also increased by a combination of the price of large-scale presses as well as the industrial organization of presses around professionalization and commercialization.

What we saw was a strict bifurcation between a large audience of passive consumers and a small cadre of professional producers, mostly commercial. Because of the cost of starting these up, we bifurcated into two basic models around the world in democracies, market-based and government-owned, and this model anchors the production of information, knowledge, and culture throughout the next 250 years translating – because of the set of political contingency, not necessarily because of the technology: the radio continuing then on to the television, satellite, the mainframe, the core structure. High-cost, centralized capital as the organizing theme of information, knowledge, and culture production characterizes the last 150 years and importantly from our perspective today the entire period of the rise of modern, complex democracies in their battle against, first, monarchies and, later, authoritarian countries.

Now, let me give you a different set of images. So in June 2002, a little bit of the shudder went through American hearts and minds interested in particular set of issues. This was when the NEC Earth Simulator was the first major supercomputer that was

much faster than anything that had been built by an American firm with – on contract with the American government. Two years later, a collective sigh of relief and people interested in super computing as IBM Gene Blue edged slightly the NEC Earth Simulator out of this position.

Throughout this entire two years, however, both were dwarfed by SETI@home, a collaborative computation project using the leftover computer cycles of 4.5 million users who when they download the little screen savers so when they don't use their PC, they call the SETI project, they take a little bit of data, they process it and they send back. And together, these dwarfed the major supercomputers funded by the wealthiest governments produced by some of the largest firms.

What this image captures for me is the critical transformative fact about computer networks. This is radical decentralization of physical capital: computation, storage and communications capacity. If you compare a television to a broadcast tower, a telephone to a switch, these are radically different machines requiring radically different capitalization that is the core around which these systems are organized. If you look at a router in a network and a laptop at its end, they're not that different. Every connected person, somewhere between 600 million and a billion people around the planet, has now the physical capital necessary to make and communicate information, knowledge, and culture.

This puts us in a very unfamiliar condition. The most important inputs into the core economic activities of the most advanced economies are widely distributed in the population. Computation and communication resources, we've already talked about and human creativity, intuition, experience, and motivation. These are not fungible. They are individual. They're unique. Any one of you who has moved a job and thought: "If I sit down and write a 3-page memo, a 30-page memo, a 300-page memo and the next person coming after me will know exactly what I know about this job," and knows that that is impossible. Understand what I mean when I say human creativity, experience and knowledge are non-fungible.

So here we are, these two basic inputs: the physical capital and the human creativity, the two core inputs widely distributed in the population. What this means is that behaviors that were once in the periphery – social motivations, cooperation, friendship, decency – things that used to be on the core, for example, somebody stops you on the street and says, "Excuse me, how do I get to Carnegie Hall?" And you either give them the way or tell them a joke or both. Now, move from the periphery to the core, not in some societies that anthropologists study when they try to understand the gift culture, but in the most advanced economies in the world today.

And we'll talk a little bit later once we've actually gotten more of a sense of how this works, about how this both threatens some markets but creating more missed market opportunities in other places, which is structuring the way the market is responding through the political system.

So what is the economic structure or the response to social production? First, we get commons-based production becoming much more important. That is to say, production without exclusion either from inputs or from outputs, which can be individual or collective, commercial or non-commercial. In particular, we see a subset growing of peer production, which is to say large-scale cooperation – and these are abstract definitions – we’ll go through some examples that will make it clear in a minute. Large-scale cooperation among human beings who contribute without either price signals or managerial commands, the core defining characteristics of markets on the one hand and firms and government production on the other. We also see and I’ll just mention it here – there’s a good – a bit more in the book, but I’ll just mention it here, sharing of material resources and the economics here are somewhat different, though they’re related.

We see, for example, distributed computing that we saw already talked about. We’re seeing the rise of wireless mesh networks. The possibility of just as people were sharing their computation in order to produce a supercomputer, people are sharing their wireless bandwidth to create a last mile and solve that particular bottleneck. We’re seeing distributed storage. If somebody in 1999 told you, “I need a distributed data storage system that will be able to serve 100 million users worldwide that will be available 24/7, 365 that will be robust to attack by anyone.” You could bring down the central server. You could send armed people to bring down major nodes. You could infect it with files and it would still be there coming back and serving maybe a quarter of internet users in the world. You’d say, “That would take me 10 years and billions of dollars.” But of course, that’s what peer-to-peer file sharing systems are. The fact that the file happens to be music is entirely irrelevant to the fact that this is an enormously robust and innovative and creative system of distributed storage on the same model as wireless mesh shares bandwidth, on the same model as SETI@home shares computation.

And we see mixtures like Skype. How many times did we hear starting in ’89 that you could never get Voice over IP unless you priced packets? How many times do you hear it today in the context of net neutrality that say if you don’t price packets, you won’t get Voice over IP? The pleasure I get from using my machine running free software over unpriced wireless – license-free wireless using Skype to get clear Voice over IP and have voice conferences that are much better than when I use the phone system. None of this is possible, right? The operating system isn’t priced. The wireless isn’t priced. The storage isn’t priced. The packets aren’t priced. And yet it works.

Now, let’s talk a little bit about peer production. What I want to say about free software is relatively little and just to show this graph. In 1995, two groups of people thought that it would be important to have web server software, the kind of software that when you go to Amazon, Amazon uses to respond to you with secure transactions. One of these groups was Microsoft, understanding this as a core intervention – as a core strategic goal. The other was a bunch of computer engineers who thought this was – this would be really important to have. Now, if I told you that 10 years later, one of these groups had 70 percent of the market and the other had 20 or 22 percent, you’d say, “Wow, the motley group of engineers succeeded in maintaining 20 percent of the market over a decade in such a mission-critical piece of software.”

But, of course, the reality the opposite. It's Apache that has 70 percent of the market, not in something peripheral where someone would save \$5,000 on licensing, but because it's better. And the thing that free software has done as a practical matter is produce a steady flow of measurably equal or better software in meeting mission-critical applications that no one, no matter how committed they are to claims about unique property and unique markets and this thing of decentralized cooperation can't work, can ignore.

But free software – the free and open source software are only one model. What we're seeing around the net because of the decentralization of the capacity – the practical capacity to act because of decentralization of capitalization and human ability is the emergence of peer production throughout the creation of content, the filtering, the generation of accreditation.

So Mars – so NASA that ran an experiment. We were – we had a few full-time Ph.D.s mapping images that came from Mars on to maps instead they took, they put the images up in these small little squares and they made it very easy for people to click on four spots and then generate a circle. And they'd showed this to five, 10, 15 people and after six months, they went and looked what happened. Eighty-five thousand people had participated. Fifty-thousand or more of them had done it more than once. The output was, quote, "practically indistinguishable from that of a fully trained Ph.D.," which suggests that we have an enormously powerful new model if you reorganize the production task, you can harness huge amounts of underutilized human creativity, human insight around it that currently is clicking the remote and can contribute both to economics and to politics.

I used to have to tell a lot about Wikipedia. Now, we all know about Wikipedia so I'll only say one thing. Periodically, almost ritualistically every three months, a story comes out about: "Oh, my goodness, Wikipedia is useless." Let me tell you an anecdote. It was one effort at a decent study run by *Nature* that took science definitions and sent it to a full-time working scientist. Comparing Wikipedia, not to one of the four or five commercial encyclopedias like Grolier and Encarta and all of these, but comparing it to the gold standard of encyclopedias, Britannica, and the answer of the scientist as presumably you must have expected was, "They are both equally crappy." (Laughter.) Now, to be equally crappy to Britannica as an encyclopedia produced by 60,000 people is breathtaking.

It's not only the creation of content because you can always worry about okay, so there's all this content out there, but what use of it? But some of the core technologies for filtering and deciding what's good and what's not good, what's relevant and what's not relevant are also produced on a peer production basis.

So Yahoo's big innovation in the late '90s was: "We don't run an algorithm. We pay people to look at websites and tell you which of them are worth seeing." So this is the site for internet law journals. On the other hand, we have the open directory project.

This is the same entry there. Sixty-thousand or so volunteers, each one caring intensely about one or two things, working a little bit here, a little bit there, adding a site, subtracting a site as they go along, producing a much more comprehensive, human-edited directory to tell you which is good and which is not good. And if you're worried about algorithms, if you think of Google's main innovation, Google's main innovation was to take the critical insight, which is what is good and what is most relevant and farm that out to the millions of people on the web who are producing their own sites and linking by counting links, by taking an image of how people there – out there are deciding what's relevant, Google became what it was. So there too relevance is produced on a peer production basis, though not an intentional one as much as a side product.

So what do we see? When concentrated capital limited the ability of people to get together on the weekends and say, "You know what? It would be really cool to produce a mass produced car." GM didn't have to worry because it was too expensive to build a production line, an assembly line in your backyard to get together with friends on the weekend and build a line of cars. We have basically along these two dimensions of whether a system is market-based or non-market, decentralized or centralized, three systems. We have the price system for decentralized market-based productions. We have firms for centralized market-based production, and for non-market production, we had centralized models – either government through taxation or nonprofits through the various giving systems.

What we are seeing now is the emergence to greater importance. Social production was always there in the household and all sorts of places that were understood as around the periphery. The emergence of social sharing and exchange as a major new alternative mode of production. What does this do? The first thing you read about, you see about and you encounter particularly in the politics is that it's a source – it's a new source of competition. The P2P system that we talked about with regard to storage, clearly putting a lot of pressure on the recording industry. Free and open source software putting pressure on Microsoft; not in the operating system as much, but certainly in web servers, certainly in other places.

Wikipedia – it is quite likely that Britannica will survive the onslaught of Wikipedia because of our attachment to sources of credibility that are institutionalized, but Grolier or Encarta? Sixty bucks a year for something that's not as good? Skype – already putting pressure on telecoms. So we see the new models that take advantage of decentralized production are putting a lot of pressure on some of the core players in the industrial information economy and their old ways of doing business.

But beyond new competition, we've already seen by starting to talk about these other businesses that there are also enormous new opportunities. We have an enormous market in the shift from well-behaved appliances like TVs and CD players to production tools, PCs, handhelds, wireless, more intelligent devices that can help you to be a producer. We shift from a strictly bifurcated consumer infrastructure goods set of markets to dual-used machines, soft infrastructure like WIFI and Skype.

Most important for the next part of the talk, we see the move from the finished information and cultural goods, like Hollywood movies and records coming out of the recording industry, the platforms of self-expression and collaboration like garage bands in some sense as Craigslist and clearly Technorati. Many of the things that people are now putting under the buzz word “Web 2.0” which I don’t know how long it will survive, but nonetheless the buzz word is capturing a sense of opportunity in building these platforms and relying on decentralized production as a business model.

And finally, we’re seeing businesses beginning to realize there’s a new set of outputs flowing, stuff flows out of connected human beings with a reasonable – a real predictability that I’m going to turn around and contract to someone else and say, “I will deliver X to you on day T because stuff will flow out of connected human beings and I will rely on to do it.” Sounds crazy until you actually look and not only that I’ll pay people to play with the people who are doing this stuff. Sounds crazy until you look at IBM’s revenues from patents as compared to Linux and this is the largest patent holder in the United States. So 2000, 2001, 2002, 2003, you see a little over a billion to a little under a billion in patent royalties, but a systematic growth in Linux-related services to over \$2 billion a year now for several years.

So this is not up in the air. Now, how small or unique? Is it just one firm? Let’s take a look at U.S. software revenues. The blue are software publishing services. These are based on copyright. The red are software services. These are not based on copyright. These are based on being able to know the software, deliver it, and deliver a customized service – systems analysis, whatever it is. So you look at the industry and you look more generally at industries if you just think of things like the Induce Act or their efforts to pass trusted system requirements. What are the relevant industries? The red industries are the recorded music and movies, in terms of annual revenues as described in the 2002 Economic Census. Green is PC and hardware, light blue is software services, and dark blue is telecoms.

What do we have? We have about \$65 billion a year’s worth of industries telling three-quarter of a trillions dollars worth of industries, “You ought to sit down at the table and design your outputs, not the fit what your consumers want, not to think what you think will increase your value most, but what will fit our business model for distribution best.” So when you hear people say, “IBM industries in the U.S. are X percent,” they’re including in that software, which two-thirds of it does not depend; patent-based PCs and PC-related innovations, which are not actually patent-based; they are widget-based and service-based and marketing-based.

Very careful with how you used these numbers, but the core point is – the core point is a massive portion of our innovation industries, our creativity, our knowledge industries is based not on intellectual property, but on other models of appropriating value. And the drive to extend intellectual property, in particular copyright and its neighboring things like DMCA, is purely regulatory constraints on massive portions of markets that are enabling a new and alternative mode of production that is a competitor to some, but an opportunity to others. And it’s a regulatory preference for some set of

incumbents over those businesses that are agile enough to find new ways of making money and generating business and generating innovation and growth around a new set of social capabilities.

So social production is a real fact, not a fad. It is the critical long term shift that's caused by the internet. In some context, it's more efficient than markets and firms, even when it's not it is clearly sustainable and growing fast. It is not a fad. It is a function of the particular form of capital investment in infrastructures that characterizes distributed networks, but it is a threat to, and therefore it is threatened by, incumbent business models.

Intellectual property, telecommunications law, a variety of other new funky laws are the battlefield over the institutional ecology. Which strategies will be easier to pursue and which will be harder? That is the core question in these regulatory battles. But before we go and move to talk about the policies, I want to spend some time talking about politics and when I say politics here I don't mean Democrat-Republican. I mean things we are generally committed to as broadly speaking liberals. Liberals not in the American colloquial sense, but in the thing that causes all of us to be seen as liberals when viewed from Iran or when viewed from Belarus. So I want to talk about autonomy, about democracy, both in the political public sphere and with regard to our critical culture, and I want to say a few words about justice and development, and I'm going to do all these in 15 minutes.

So the first thing to know, there's a lot to say about autonomy, but critically I want to focus on the ability to move from consumers to users, from passive receivers of other people's stuff to active makers, and in particular the greater practical individual autonomy can do more for and by ourselves and to do more in loose association with others. It used to be that there were certain things that in order to do you had to be in association with others, but those required enormous commitment – family, workplace, neighborhood. Now, we're seeing networks emerged that allow people to spend half an hour every other day with 60,000 other people doing something new and interesting and valuable. It expands the horizons of what we can do precisely because of the looseness of our ability to cooperate.

So here is an interesting site, if you Google "Viking ships," the first site – and this has been true now – it has been first, second, third for the last five or six years since I have started to show this, great site for kid's education, Materials on Viking Ships. Worldwide great site. It's produced by a fifth-grade teacher in Gander, Newfoundland, out of his classroom. Imagine what it would mean to produce teaching materials on a subject about which you are passionate from a classroom in Gander, Newfoundland, before this. Impossible, it's just not part of the set of things you can do. Nowadays that is a new form of autonomy.

If you look at Michael Hardin (sp), project Guttenberg, for about 20 years he was trying to build together a digitized database of books. Now, only with the introduction of the ability to collaborate with other people did it really take off and become a major

project. So again some things you can do from your classroom in Gander, Newfoundland; some things you will need the help of other people, but now you can neither through the market, nor through the firm, nor through systematic deep engagement of the kind of five-year employment relationship or more.

Now I want to talk about democracy and in particular I'm going to start by talking about the political public sphere. The baseline thing to remember is that we have our stories about the coffee houses of the early English parliamentary system, we have our stories about Ben Franklin, but basically the public sphere in modern democracies is a new phenomena and it's all been done in the context of mass media.

So the question we have to answer is, what does the public sphere look like in a distributed network? Let me tell you a couple of stories on that. So this is the place that everyone remembers at the height of the success of the fourth estate. Hejlsberg sends the materials to the *New York Times*, the *New York Times* pays people to sit in a room and read the Pentagon Papers, come out and tell the public, "hear what we, respected media, have found that is important" – the U.S. comes with an injunction, they shift over to the *Washington Post*, the injunction moves forward but they have enough money to pursue all the way to the Supreme Court, which comes back (writing?) saving the public and their knowledge, and this is how we begin to learn about just how bad things were.

That is the model in the ideal case. What is the model in the alternative? So if you may recall, there were one or two disagreements about the elections in 2000 that had to do with vote counting. In 2002, there was an early experiment with voting machines. The mainstream media – I looked high and wide, there are a very small number of stories, all of them take the form of either not mentioning arguments about voting at all or they say, oh, there are a few radicals who say there are problems but we are assured by X that these things are working well and we are assured by Y that there is good customer support. And X is the official who built the machines and Y is the person who sold them, and that is it.

One activist finds source code from an FTP site. What does she do? She puts it on her own website: [blackboxvoting](#). She also sends it and it's up and scoop in New Zealand – the New Zealand site. That really gives us a little bit of insight about how fundamentally different this is. So the first thing, we can now reveal for the first time here are the files, so the first thing that is characterized by the network – "here, see for yourself," not "trust us, we have really smart people on our payroll."

The second thing is somebody is going to try to squelch it. Make copies, put it out there so you can't be squelched. Oh, and by the way, some of these are password protected. There are all these nice people from [LostPasswords.com](#); they are going to help you get around it. And some of these might actually be broken. Here are these other nice people from ([Zip Repair?](#)) who are going to help us a little bit. And by the way, we don't have the money to pay anyone to spend weeks reading through this but it is really important. Good hunting; let us know here what you find.

And in fact that works because one – many people look at it. One computer scientist and his team at John Hopkins, Avi Rubin (sp), finds problems with the source code. There is peer review, there is media exposure, there is Diebold response. Maryland orders a review, and some of the components of the system are actually changed. At that point, Bev Harris (ph) becomes a node and then an anonymous whistleblower finds some internal emails, sends them to *Wired* magazine, which in this case does the mass media thing of saying “Can you believe these people lost their code again?” She on the other hand knows what to do, she puts it out there. At this point, however, Diebold brings a DMCA action and says, “Those emails are ours. They belong to us under copyright. You, the service provider, the ISP, have to take them off.” So this gets cut off. No, because some Swarthmore students have now put out these emails, but Diebold knows what to do so they send a cease and desist letter to Swarthmore saying, “Take these off. They’re ours.”

End of story? Not quite, because at this point the emails have now been distributed into an ecology of individuals and groups acting legally and illegally, commercially and non-commercially to create a persistent presence for these materials. Individual users in other campuses.

Free software developers developed Free Net as a censorship-resistant system which in their minds focused more on China and on Iran than on the U.S. The emails are (injected there?). E-Donkey develops overnight for file sharing, a commercial firm trying to make money from people who are trying illegally to share files. Free software developers developed interfaces through this, the emails go in there too because data is data. With this persistence, we suddenly see within a few weeks the California State Commission, which was about to certify Diebold machines, saying, “Well, we’ve heard issues. Let’s do another study on it.” It’s very dramatic; you read the meeting notes and they are all about to do it and, “Well, actually we’ve heard some unpleasant things,” and a study occurs and it turns out that many of the machines were not compliant with the way they were certified – not all, but many then get decertified and reintroduced.

Now, it’s not that the courts played no role here. The students, supported by the Electronic Frontier Foundation, did in fact bring an action, and they won it – and they won it so much that Diebold was required to pay even after they promised not to do anything. The case was not mooted and they were required to pay attorneys’ fees to the students and to the EFF. But this happened one year later; that is to say, too late for anything to have happened with the machines.

Now, I’m at a stage where it’s – to say the internet democratizes is almost like saying dog bites man. It is, isn’t it? Yes, that’s what I did mean to say. Which is to say, everybody has been saying this for over a decade. We know this, we’ve heard this. There is a first generation critique that basically says this is (unintelligible) republic.com is sort of the iconic place for that. No, actually you get fragmentation. Nobody talks to anybody else, there is no public sphere, and you get the polarization because people don’t talk to each other. Anyway, who will play the watch dog? We’ve already found that out in this story.

Then there is a second generation critique which in some sense undermines the first generation critique, but creates a really deep problem, and that is (power law?) distribution of network connections; which is to say, a very small number of sites gets an enormous number of links and millions of sites get no one, so in fact what you have here – so goes the claim – is precisely the freedom of the soap box. Be my guest, stand out in the park in the soap box, much good it will do you in the public sphere. Of course, if that is true, then the fragmentation problem isn't there because we are all listening to the same sites.

Now it turns out – and I spent a good bit of time going through the technical literature because it turns out these are both empirical claims: both the internet democratizes and the claims against it. And we now have much better data about the way that the web communications are structured. And the ultimate answer, as best we can describe now from the present data, is a number of things. First of all, topics cluster: blogs on laundry detergent link to each other, blogs on politics link to each other. Liberal blogs link to each other more than they link across the divide. Republican blogs more than link to each other, but they also link a lot across the divide. There is also a lot of interpretation.

So, for example, Albert Varavashi (ph) one of the main physicists doing the empirical work says, “Look, half the sites on the web can't be reached from anywhere. What sort of democracy is that?” And I say to myself, let's see, there is NBC, CBS, and ABC; now there is maybe another 500 channels one way or the other. And there are half the people on the internet that can be reached from anywhere through redundant paths. I'll take that as an improvement any day.

So what we see is topical clusters at small scales, and this is very important. We see moderate visibility bodies developing. That is to say, dozens of sites, even low hundreds of sites, with dozens of links each. Now it means that there is not just one op-ed or two op-ed. There are dozens of sites which can be connected. And the thing that floats to the top is not that which can capture the most audience; that is to say, has the thinnest degree of connection to lots of people, but what is intensely interesting to people within a particular cluster of interest. The superstars – the ones that really are high up on the (tail?) then become not the broadcast stations we listen to, but the broadcast antenna that continued to broadcast throughout the net to other higher level, bigger clusters what it is that this particularly intensely interested crowd wanted to see.

So we see a hugely strong, redundantly, strongly interconnected core with many redundant parts among the clusters. So, no, not everyone a pamphleteer, but we're also not intellectual lemmings. The structured web offers more visibility to more people in accreditation and filtration clusters. More free of the financing constraints on speech, more resistant to being able to purchase one or two outs, emphasizing what it is intensely interesting to active users who link and read, not what retains moderately interested, passive consumers. We see strong linking practices in major sites; many hubs themselves cooperative, like Slash Dot, like Daily Kos; a strong see-for-yourself ethic and peer

review; easier for individuals and small groups to speak and heard, though not trivial it's easier than before. Easier to form purpose of association to actually be able to come together and do something. And global in nature, not only local.

Critical culture. Beyond the political system – culture – the way we tell stories about where we are, where we might be going, what matters is also central to our political consciousness and our ability to be a democratic system. Here we see a few things. The first is plasticity and malleability of the materials, Anime movie videos, parodies, remix culture – so let me just give one example, and if you've seen it raise your hands and I'll stop it.

(Lionel Ritchie's *Endless Love* plays.)

PROF. BENKLER: So the ability.

MR. : (Off mike., laughter.)

PROF. BENKLER: They just call it RML Bush Blair – Google it, you'll find it's easy.

Now the critical thing to see is that what we're seeing here is a reemergence of a new form of folk culture based on active participation rather than passive consumption. Recorded music, recorded film taught us certain helplessness that the social thing to do is to sit in front of a TV and click together. And then kid productions in school. What we're beginning to see is the very early, but nonetheless the very real, emergence of the tools of digital creativity becoming themselves closer to what is available to people on the periphery, to what is available in Hollywood, the people in the recording industry. And so we are seeing the emergence of the possibility of a reemergence of folk culture at the new, high-production level with the new tools, and this is enormously transformative for who can tell stories about how we should live our lives together.

The other thing we see is much more transparency. Critical evaluation moves from things you do in academic seminars to things you can do in blogs or in Wikipedia. And practicing making these things makes people better readers. So this is what you see for Barbie on encyclopedia Encarta, this is the entire definition and this is the typical Barbie. On Wikipedia, on other hand, you have a full, long discussion including explanations of Barbie as a cultural object, better, worse, why – a talk page in which people then actually argue off page about what to do and what not to do. The transparency of the cultural icons changes. Encyclopedia.com, by the way, has Barbie Klaus.

When you go to Google, what you see is that the first site is in fact Barbie.com. The second site there was already AdiosBarbie.com, a body image for every side. Because, again, the judgment about what the meaning is of Barbie is decentralized. Who is linked to most? By comparison, Overture, which maybe most you won't remember – there was a time when I started writing about this that Overture was the thing that Disney

backed and the thing that was basically the false search engine in AOL. Here the way you get ranked higher is you pay more to Overture, then you get ranked higher. First of all, we know which of those two won in the market – quite clearly. And second, you can go down pages and pages before you get to Adios Barbie when they've run out of people willing to pay.

Finally, I want to say just a few words about justice, not more, and then talk about policy. More of what makes for human welfare and development depends now on information, knowledge and culture. If we just look at the human development index and its three main components – health through life expectancy, education through literacy, and GDP per capita or growth – each of these is critically dependent on how we produce information, knowledge, and culture; how we manage our industrial outputs and their capacity to contribute to human development.

For health and life expectancy we see food security and agricultural and agronomic and biotechnological research. We see drugs for pharmaceuticals. We see research in journals. We see how outcomes data is collected and controlled for purposes of public health policies. With education, it's almost too easy to say, right? Books and teaching materials, computation and communications, libraries, academic centers through journals. And for growth, we've known for at least 50 years that innovation is more important to growth than static efficiency. Innovation is absolutely central to growth. This is true particularly on a global level for latecomers who need to adopt best practices rather than being required to pay the rents on existing information – and these feedback on each other.

So how do we manage information, how do we produce it, and in particular what intellectual property system is there that constrains who can play, who can access, who comes with what, is central.

We are beginning now to see commons-based and peer production beginning to help. Now, unlike what I said about freedom – both autonomy and democracy – the effects here I think at the moment are much smaller, but the magnitude of the need is so great that even a small effect is worthwhile pursuing. So free and open source software is where we are seeing this most as a development program, partly in order to achieve good and relatively cheap implementation of computers, but partly also as a system of allowing poorer countries to come and participate in the software services market. We see this in open academic publishing, more cutting edge, exciting but still uncertain – we're beginning to see open source agricultural innovation, maybe even medical innovation through the BIOS initiative – Biological Innovation for an Open Society. In medicine, bioinformatics has largely now – the open bioinformatics movement is more important than other forms of bioinformatics. They are like the free software and the open source software development community. That is how the human genome is done today. That's how the haplotype mapping projects are done today. We are beginning even for people talk about biotechnology.

So an example. Now, this not yet a success; it's very far. I have a paper on why it's not quite going, but still – an image. Free high school science texts, graduate students in the University of Cape Town create a Wikipedia-like model for trying to get people to create. They are now on the verge of getting their first high school science text approved, which will be available freely in South African high school. They are halfway through math and chemistry. It's more an indication of a solution space than an example of an actual success yet, but it is interesting.

The HapMap map project – major next step in mapping human genomics; all done on an open innovation model. You download the data, you annotate it, you upload it. Again, that is the condition on which you can get the data. It is like an open source community. And as I said, BIOS, Biological Innovation for an Open Society, is an Australian nonprofit research center that is beginning to build the bio forge on the model of source forge for open development for research tools; trying to solve some of the anti commons problems with research on this model.

So now let me try your patience just a few more minutes and talk about policies. The way that I organize my thoughts about policies are in a layered model, so I will first talk about policies that have to do with a physical layer. Those policies that go to how do we get our bandwidth? How do we get our processing? How do we get our storage? How much control do we really have over them as opposed to how much control is elsewhere? Then I'll talk a little bit about the logical layer, the software, and the standards. Finally I'll end up talking about the content, the wealth of materials out of which you can make a video like that, the wealth of materials out of which you make and remake software.

So first the physical layer. The physical layer has two components: connectivity and computation. Connectivity – we're now basically seeing a battle between two alternative buckets, and everything will show up. It will turn out that there are two alternative ways pushing back and forth, so this is the structure. We have today a broadband duopoly. People are waving their arms saying there is broadband at a power line just around the corner and commercial wireless – it's all of that. It's exactly the same sort of things that were said in '91 where people were beginning to work on the '96 act. I actually have – I should have brought it – this image of – you see you have all of these five different places and they all come and they sound identical to the stuff that people are saying today. And they may in fact happen one day, but as a basis for policy it's a problem.

So we had Brand X case on the question of telecoms provider versus information service. And Justice Scalia's scathing dissent there gave us a good insight in to why the idea that because cable companies today happen to be selling their package together with e-mail and web hosting together with bit-carriage, then the whole thing as an information service as opposed to what it actually is, which is you are carrying bits and you are bundling with it another service in a way that may or may not be discriminatory. And so the net neutrality debate that we are in the middle of, which in some sense is a replay of the open access debate that we lost in 2002 – and here “we” in this case is people who

think that all these things I've just described that both improve growth and innovation, and freedom and justice would find helpful. And the critical move here is, are these policies enabling social production? Are they supporting the decentralization of capitalization that's enabling all this, or are they trying to reconcentrate the capitalization or at least the control over the uses of that physical capital and human creativity so as to support some incumbent business model?

Now, there are some facts. We're behind in broadband and we're falling further behind. Today, we're twelfth in the OECD. We're about three years away from being nineteenth. Most of these other places have unbundling, unbundled bit stream access – actually all but one or two. It's a complicated question whether this is the cause. These are very multifactorial questions, but it is also a fact. What we have is broadband duopoly that has moved from being a regulated common carrier, as it was in the '90s and early '00s and by implication because of the risk up until brand X, to something that is really an unregulated duopoly.

Pushing back, however, is the technological development of open wireless networks, the adoption by municipalities of the effort to actually use these as municipal broadband networks – and so the technology and the social practice, and the local government action is pushing toward systems that their users control rather than that are concentrated, again, around the bottleneck.

Now, Powell and Gallagher of the FCC and NTIA understood this for a while, and the FCC for a while was accepting open spectrum. Now it looks like it's going back. A lot of arguments that I thought in 2002–2003 we'd more or less gotten over, in terms of people comparing spectrum to real estate and such ignorant moves, are returning. And municipal broadband is now developing, but it's developing in the context of strong state resistant through lobbying. So I don't know which way this comes out, but that is what is at stake.

In the machines, the critical – perhaps the single most important, destructive piece of legislation that could happen is regulatory requirements for trusted systems because the object here is to take this damn machine that is allowing people to do something other than watch – and do. So let's make sure that this machine only lets them watch. Let's hobble the machine to the point where there will be only one approved content. So we saw this in the Sibidibita (ph), in the Induce Act – efforts to force PCs to become well behaved appliances. I can't imagine a single more destructive move if it were to succeed. The broadcast flag and the webcasting – and the broadcast treaty are similar, though on a smaller model.

What's pushing back is the market. The value of the general purpose device to the population is so great that we keep developing better and better general purpose machines. And the effort here is to regulate that enormous market pull and that enormous social and cultural attachment to the freedoms it makes possible, in order to preserve a couple of industries. So that's the physical infrastructure – the physical layer.

At the logical layer we are beginning to see software patents, we see proprietary standards, and we see desktop monopoly to some extent pushing, but here we have a very strong push back from a combination of two things. First – the free software movement and the open source development community combined are simply producing outputs that are pushing back and providing alternatives and sometimes displacing the proprietary model.

The other newer but equally, if not more, critical fact is the increasing business awareness of the value of non proprietary techniques. Give us open standards, give us free software – we'll compete on services and we'll grow that way. This is a source of new alliances such as the ones we saw surprisingly in all sorts of places like in the Grokster case when you look at the (anarchy?) brief and you find Intel and Verizon on the side of Grokster. You understand there is something very basic here because people are trying to regulate the logical layer in order to achieve results in content industries in a way that is quashing or dampening innovation.

So as we talk about the DMCA, the No Electronic Theft Act – this outcome of Grokster, which basically puts tools creators in a condition of uncertainty, so we are seeing efforts to push back to create fair use for the DMCA, a legislative reintroduction of Sony might be nice so as to create more freedom to innovate – freedom from risk. And pushing back, again, the increasing practical success of sharing practices. Again we see society and business going in what I consider to be the right direction, and legislative maneuvers going in the wrong direction. So in the logical layer we see the same structure again. It's not clear which way it will come out: society, markets, technology are pushing one way; legislation, courts, administration pushing the other way.

When we get to the battle over the content environment, it is too long of a list to put in here. The major good news is that most of it is from the '90s and very early '00s and we've been in a somewhat of a stalemate for the last five years with new successful efforts to push the enclosure movement further. So the right to read, fair use is now (read?) criminalization – no de minimus sampling. If we look, there are certain things that came from courts, like the right to read, the narrowing of fair use, the idea that there is no such thing as cutting and pasting – everything I showed you was a violation. Contractual enclosure, which is coming from the state courts – funky new rights – trespass to (chat?) is also coming from state courts. We are also getting legislative materials from criminalization, term extension, database rights – moves to try to shape the legislative arena.

And at the international level we're seeing international harmonization – very important to understand: we have a playable international system. What fails in one country might succeed in another and then we get harmonization. What fails in both countries might succeed in a multilateral agreement, which then gets generalized downwards. What fails in a multilateral system might succeed in a series of bilateral trade agreements and then ratcheting the international system up and ratcheting the state system up. And we have a series of incumbents who are pushing back and forth in order to get the strongest possible constraints on distributed innovation.

So to wrap up, technological threshold conditions enable greater individual agency. Social sharing and exchange emerge as a major modality of economic production. We are beginning to practice new ways of being free and equal human beings, but these practices and these abilities are subject to a global and persistent political and regulatory battle.

Law, unfortunately, in all its agencies – legislators, courts, administrative agencies – are getting it systematically wrong. This is undermining both innovation-driven growth and our core commitments to freedom and justice. These efforts to regulate the direction that market, society, and technology are leading us are a combination of rent-seeking corruption or lobbying, well intentioned ineptitude, and ideologically induced willful blindness.

And I'll leave you with this thought: letting the incumbents of the twentieth century industrial information economy determine the terms of innovation, growth, and competition in the twenty-first century is a mistake. Allowing them to prevent our ability to become more equal, freer human beings in the twenty-first century is unforgivable.

Thank you.

(Applause.)

Q: My name is (off mike) – oh, thank you. I am an intern here at CAP and I was also one of the Swarthmore students that sued Diebold. Since that time, my friend Nelson and I, together with a lot of other people, started the student Free Culture movement. I would just like to ask, how could we as a student movement best deploy our resources to have the greatest possible effect in this sort of battle over the future of the internet and technology?

PROF. BENKLER: This just reminds me that I forgot to mention the push back on the content layer including the Free Culture movement as one of its components and the Access to Knowledge movement and the Creative Commons.

I think the very fact of the Free Culture movement, the very politicization of students and twenty-somethings into understanding that this set of legislative and regulatory battles, technical though they may seem, are about their very ability to be productive, free human beings for what will be most of their lifetimes is absolutely central. I think the possibilities for organization on the net are one of the things that are enabling. I think to have a single-interest organization – and this is not necessarily only the Free Culture movement, but certainly that as well – when an election comes up, one of the amazing things that has been hard for me to understand over time is that these set of issues don't tend to be clearly party aligned. And so I think one of the things you can begin to do is as you look at races – the phone, email – what are you doing on this? What is your position on this? This is something that there is a discrete set of people with a

particular age and a particular profile that are actually being active. This will be for them central.

It's not a small technical issue, it's as central to their freedom as many other things that were there before. And if you actually have a movement of people who are capable of organizing, using these very low cost tools, that could have an effect.

Q: Yochai, wonderful talk. You are in Washington today and there is another whole part of Washington which has to do with military, national security, how computing is going to be done there, and the discussion of computer security in your talk was very short to really not there. So when it comes to trusted computing, if you are running the Air Force communication systems you wanted it trusted. When you have a Veterans Administration database with 27 million names, you want it trusted; it's not leaking out. When the FBI and the CIA are trying to do information sharing on investigative leads, they want to be pretty careful everyone doesn't see it. And so having trust at the software in the hardware layers are very tempting for people running these sorts of systems where disclosures to the wrong people is considered to be a real big problem.

And I wonder to what extent in your own research you have thought about how to interface that world with the world of commercial creative content and creative software that you've done, because there are entirely different intuitions about how to move there, and the need for trust by the people running those systems is really, really high.

PROF. BENKLER: Yes. There are several components to the answer. At the simplest level, and one that I didn't do in the book, but I have a paper on on peer production of cyber security, essentially. Thank you. It depends on what is your critical system. So at the broader level of abstraction there are ways of achieving large clusters of what security is concerned with that are decentralized and distributed and therefore would be more robust. And practically all systems that are not about denying access to information but about assuring a steady flow of capabilities, be it communication capabilities, computations capabilities, storage capabilities, data backup capabilities – a whole set of things that actually decentralized, redundant systems would be better for, but your example is focused precisely on that narrower slice. It's not cyber security general; it's the narrower slice of denying access to materials.

And here the problem is a little different and it goes to the question of what sort of interventions do you have? Do you have interventions that are more encryption-based, at the edge, at the target? Or do you try to restructure the whole system of communication in order to achieve that result?

There are two reasons why one would want to be cautious or skeptical about that strategy of trying to support security through requiring trusted systems. The first is – call it idealistic. There is always a conflict between the needs of security and the needs of freedom, between the needs of the ability to control the population and its ability to be

productive. This is just another such instance: find a way that is less destructive to our productivity and freedom.

There is another which is perhaps more practical, which has to do with politics in the sense of politics as opposed to political fury, and that is this is a set of constraints that imposes such enormous costs on so many business and so many individuals that the certainty with which you can achieve the ultimate result you want and need is sufficiently low that it may be better to focus on end-point security. And it was one of the very first boosts, as it were, to Linux when the NSA actually released a Linux approved for government use – a distribution of Linux that was approved for government use, for NSA use – actually not for NSA use. “Approved as secure,” that’s all it was.

Finally on the other side, yes, there is no question that an alliance between Hollywood and the recording industry on one hand, and the security folks on the other hand is a formidable political alliance pushing for trusted systems, which is one reason why I am so emphatic about how enormous a cost it would impose on us as a country in terms both economic and political because it is a cost we cannot pay.

Oh, I’m sorry there was a question already –

Q: Hi, I’m Michael Nicks (sp). I’m an energy consultant here in town. I was concerned by your comment, Professor, on how it seems we are – those of us who are trying to break down the barriers here are losing some of the court battles here. I know in the energy business, which is regulated much more at the state level, we are losing a lot of these battles to be innovative in the state public service commissions and state courts because, as you are rightly putting, we are fighting against these incumbent interests who are long established with great financial resources at their disposal.

Some of my friends who are working with you and representing a lot of your likeminded allies fighting against Microsoft for Netscape and this kind of thing, fighting for small innovative companies that are trying to break down the barriers and have access to the grid, they are finding that they are coming up against the same barriers. And I’m just wondering – you are mentioning here to the gentleman from sophomore that there are the twenty-somethings and the thirty-somethings and some of the forty-somethings that are fighting for this. Are we at a disadvantage here financially? Because I always look at these in terms of a lobbyist/advocate, this kind of thing. I’m trying to say, okay, where are our financial resources coming from and where are we moving to?

Mr. Podesta’s had a panel up there on local service carriers and how the regional Bell operating companies in Indiana and Pennsylvania have tried to thwart local internet operating companies from establishing themselves in small rural communities. I just wanted you to comment on that and where you see us going forward.

PROF. BENKLER: Okay. I think that there is no one answer to all of that. Different components of this battle are being fought with different and shifting alliances. When you are talking about regulation of the software, of the logical layer and the

content layer, there is loose and certainly potential collaboration – alliance – between the telecoms. Verizon was on the same side as Intel, on the same side as Public Knowledge on Grokster, and EFF on Grokster because these are companies that are not built on a copyright based model.

Now, the problem there is that Hollywood and the recording industry have optimized for lobbying on their particular regulatory system copyright for close to a century. And so even though there is a lot more economic heft behind limiting copyright and limiting the extensive rights around it, there is not yet – particularly in the IT sector – a genuine sense of how urgent this is and how important it is. And so they are just not as good at it even though they are several times larger in terms of total economic effect.

On telecoms the story is different because there you have got a \$450 billion a year industry that has as one of its core competencies for 90 years playing the regulatory system it exists in. And on the other hand you have about \$400 to \$500 billion in industries that are relatively newcomers and their core competency has been innovation and not lobbying and manipulating the regulatory system. So there I am a lot more worried. Nonetheless, the reason that I set these up as one opposed to the other is to see that not everything is determined by politics. Much is determined by society and market and practices within these and one enormous success of those people in Washington working in the legislature in particular has been to simply stop this stuff.

As long as society and markets are permitted to move forward towards what they at the moment seem to be moving forward on most of these levels. As long as the efforts to render illegal much of what is going on are blocked, that by itself is victory on an important trajectory.

Q: Hi, Yochai.

PROF. BENKLER: Hi Sarah.

Q: Sarah Stirland from *National Journal's* Technology Daily. It is true that we live in this increasingly peer-to-peer world, but the last-mile networks aren't being built by you and me, they are being built by large companies. So what would you say the neutrality debate to look at cable companies and everyone else, about what the policy should be?

PROF. BENKLER: Well there are two components to answer that. One is to express the premise and the other is to reject it. Accept the premise – as I said, it's a duopoly – somewhere between a monopoly and a half and a duopoly of a core infrastructure good. That's a real bottleneck that is divided between bit carriage and content and value-added services. If we want competition, we need to be in one of two conditions: either commoditize bit carriage markets that will genuinely discipline the carriers with regard to discrimination upstream in the content, which the whole point of discriminating is to avoid being genuinely a commodity that is really controlled by the

market, or we need a form of minimal regulation that requires at a minimum nondiscrimination among packets.

So what we are having is an argument about should competition or should regulation. And in fact competition – absence of regulation is not competition. Market conditions that actually create bit – where bits are actual commodities, where they really can be “if you don’t pass my packets quickly enough, I have seven other people offering me bit carriage at the same rate at a better speed,” then there is really market discipline and then you don’t need any kind of regulation. But the whole point of the new moves – right after brand X, the new moves of both cable and telecom has been to establish on a public agenda, we have the right and should continue to have the right to discriminate among packets, which means there is the assumption and the intention to exercise sufficient control over the bits that you can actually differentiate, which means they don’t think they are really going to be in a genuinely disciplined commodity market, they think they can retain some control. And if that is true, then they need to be regulated because in order to have real competition where it can happen, not in the construction of the last mile where it can’t, but where it can happen in the electronics that hang off the network, in the content, in the applications, then you need regulated bit carriage. So that is when I accept the premise.

Now, I don’t know which way the politics will go. As I said already in the prior – the money and the facility is so great that despite what happened in the committee the other day, we may well not get a neutrality requirement. We may well be stuck in an unregulated duopoly model. And to the extent that I am optimistic, I am optimistic from what came on the other side – from the other side of the slide. Open wireless networks do provide a path through which we could roll or own last mile. It doesn’t require new science, it doesn’t require even new technology; it requires some engineering and a little bit less regulatory interference to try to prohibit the deployment of unlicensed spectrum devices. Just a little bit of improvement might provide us a real alternative last mile which if permitted to grow could well get us to the point where we don’t need regulation at the physical infrastructure of the last mile because we will have a user-owned alternative network.

MR. MALAMUD: Last question.

Q: Hi, my name is Bryan Dolber (ph). I’m wearing two hats today actually. First, I am a congressional entertainment industries caucus fellow in Representative Diane Watson’s office, and second, I am a Ph.D. student at the Institute of Communications Research in the University of Illinois. So with my first hat on, I am curious to what extent is the creative community as a whole involved in some of the policies that you would be interested in? Representative Watson obviously has – you know, representing the Hollywood area has a lot of concern about creative interests across the board, and I am wondering if there are organizations of – if anybody is aware – yourself in particular – of folks from that perspective who are involved in working towards systems like you are talking about.

Second, with my other hat on, I am curious about how you are thinking about the public sphere, your conceptualization seems a little technologically determined and I am wondering to what extent that might create some limits on a public sphere and the kind of content that is created and what we could maybe do politically to ameliorate some of those possible limits, if you see them.

PROF. BENKLER: The question of technological determinism is an important one. Needless to say what you can do in a presentation, even one spoken with great rapidity, is less than what you can do in a book. I am not a technology determinist. I try to build a fairly careful model that is somewhere between the technological determinists on one side or the self-determinists on one side and the people who think that it is largely political and socially constructed on the other side.

I think technology does – first of all, I think that technological development is a social subsystem that has its own internal dynamics that are separated from other systems and can be explained in terms of its trajectory independent of what society as a whole wants or the political system wants or the market system wants necessarily, though it is of course constrained by what these other systems do to it.

And I also think that different technologies have different affordances and constraints. They make some things easier or harder. It's not impossible. And so the dynamic between on one hand the social system of technological production, on the other hand culture, markets, law, ends up during some periods of instability there is a lot of openness in how the technology develops, in how the practices develop. And then during other periods when things have more or less adjusted to each other, it's very hard to move things. I think we are at a moment of openness now where what we do in the next five to ten years will have an enormous effect on how we are structured for the next 50, and so that is why I think it is very important what we are doing now.

On the question of the creative community, as you call it, I think there are very different and diverse interests in different portions of the creative community. I think, for example, the alliance today between music and Hollywood is an alliance of convenience and habit, but ultimately the recording industry is substantially more threatened by what is going on given the way they have been structured over the last 50 years or so than Hollywood. The cost structure is different, the contracts are different, the possibilities of extracting value from stable things like live performances is different, the availability of an advertising-based model is different, and so I can see essentially two main trajectories for the industries like Hollywood beyond and past these battles.

The first one is adaptation and adjustment. There is a particular business model that has characterized Hollywood from about 1985 until now; which is to say – let us just remember: Hollywood didn't have home-use market segments before, other than television. And just since then – so we had about 20 years' worth of expansion that is at stake. Neither the prior nor – is at stake. And the question then becomes, do you build new business models where you begin to learn – and this is quite difficult to do the translation, I don't do it in the book so in a sense I'm ad-libbing. How are you going to

construct consumer experiences that make them want to participate in a movie other than going out? Make them want to pay for access to databases in the way that people do for immersive worlds, for multiplayer online games. There are other business models that depend more on a continuing relationship either to a database or to a set of people or to a set of cultural meanings that allow you with some contraction perhaps – or not – quite possibly with some growth to adapt.

There is another, and in a sense more aggressive position which is particularly, I think, relevant to the recording industry and less relevant to Hollywood because of the cost of production, and that is that what is considered to be the creative community is too narrow. It is not the people in Hollywood or those with recording contracts; it's people actually are creative and want to be creative in what it is that they like to see and do.

And so in thinking of the creative community as only those in the industrial information economy, you are severely limiting the recognition of what is the range of creators actually want and are able to create using new models that are sustainable at a much lower level for them and nonetheless are enormously important to our cultural creativity.

MR. MALAMUD: Thank you very much, Yochai. We made you a tee-shirt. It says third motor. It's got a fist with three ethernet cables.

PROF. BENKLER: Great! Thank you.

MR. MALAMUD: Made you two different sizes.

PROF. BENKLER: Excellent.

MR. MALAMUD: Thank you very much.

Don't forget, June 16<sup>th</sup> we have Professor Larry Lessig coming to give a lecture. This is a twofer. We encourage you to attend that one as well. He has also got some views that may be not intuitive on where our economy is going and what should be happening here in Washington. So thank you very much for coming.

(END)