FEDERAL TRADE COMMISSION

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FEDERAL TRADE COMMISSION

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PROTECTING CONSUMERS	)
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TUESDAY, NOVEMBER 7, 2006

GEORGE WASHINGTON UNIVERSITY
LISNER AUDITORIUM
730 21st Street, N.W.
Washington, D.C.

The above-entitled workshop commenced, pursuant to notice, at 9:00 a.m., reported by Brenda Smonskey.

P R O C E E D I N G S

MR. RAINIE: My name is Lee Rainie, and I'm delighted to welcome you to the second day of the Federal Trade Commission's Tech-ade hearings.

We have a wonderful panel to start the day on the benefits to consumers of living in an instant information culture.

Just to introduce the panelists here, we will be hearing from Kamran Pourzanjani, the president and co-founder of PriceGrabber.com; Mark Chandler, executive vice president of sales the chief operating officer of Autoland; Liam Lavery, who is the general counsel for Zillow.com; Jeff Fox, the technology editor for ConsumerReports.org.

And, unfortunately, Sucharita Mulpuru is not able to be here. She is from Forrester Research. She has a sick child today. So I will be doing some of the presentation of her slides because I know the data from Forrester. It is wonderful stuff. It also matches up pretty nicely with the data we gathered from the Pew Internet Project.

Since this is a panel about the benefits to consumers living in the information age, the Federal Tech Commission -- Federal Trade Commission has gone out and done some user-generated content.

They have created a video of interviews with people in the streets about how they use the Internet to think about consumer purchases.

So why don't we roll that tape now.

(Whereupon, the video was played.)

MR. RAINIE: Soon to be coming to a YouTube near you. Going to try it again. Here we go.

(Pause.)

Okay. I don't know that I would give it a high consumer ranking on YouTube.

Since it is also Election Day, there are tools next to you, voting machines next to you. I wonder if you would be okay answering the following question on your clickers next to you.

I use Internet shopping sites primarily to: Number 1, research products and services; number 2, read product reviews; number 3, compare prices; number 4, make purchases; and 5, none of the above.

If you will vote in realtime now. We will show you the results here. We had a little side bet back stage about how you were going to be voting.

AUDIENCE MEMBER: Can you repeat that?

MR. RAINIE: I use Internet retail sites primarily, not how you ever use them, but how you use them primarily. Number 1, research products and

services; number 2, read product reviews; number 3, compare prices; number 4, make purchases; and number 5, or E, none of the above. Sorry, I was reading numbers instead of letters.

How are we doing here? All right. Make purchases is the number one answer.

If you add up all of the research-related things, though, it is getting pretty close to making purchases, doing research online.

With that as sort of your experience, let's see how it matches up to what the panelists are going to be able to describe to you.

First up here is Kamran Pourzanjani, who is the president and co-founder of PriceGrabber.

MR. POURZANJANI: Good morning. Thank you, Lee.

Hopefully I will do a little better than the video, but I won't make promises.

Before I get started, I wanted to see by show of hands, nothing else, sort of low-tech, how many people know about PriceGrabber, have used PriceGrabber before?

I think I have come to the right place. There is no doubt about that.

How many of you have used comparison shopping in general? Can I see a show of hands?

Those of you who raised your hand, you are among

the estimated 25 to 30 percent of consumers or Internet users that have realized and taken advantage of the power of comparison shopping to save time and money.

So PriceGrabber is a comparison shopping service. We bring all the relevant information on products and services, on prices and on sellers to consumers so they can make the most informed purchasing decision.

We have about 21 million unique users that use our service. We have about 32 million products in our database in 22 different categories, everything from books and music to apparel to travel, consumer electronics and many, many different products. You will see this in a few minutes.

There are over 11,000 merchants that work with PriceGrabber. These include all the name brands that you know. Beyond that, we also have smaller merchants, medium sized merchants and even individuals. So people like yourself can sell products, whether new or used, on PriceGrabber.

We also partner with a number of different sites, portals, ISPs or enthusiasts and content sites to power the comparison shopping or shopping. So if you use the comparison shopping on I-Village or on About.com, Comcast, you are actually taking advantage of

PriceGrabber technology.

Finally, you can use PriceGrabber through the Internet, your computer or through your Web or mobile device. We have sites for Canada, U.S., U.K., as well as sites in Spanish and Portugese.

So this next chart shows you our home page, very simple, basically all the different 22 categories of products for which you can shop, basically the categories and subcategories and some popular products.

You also can actually log into your own account here with a different set of features. It is a very feature-rich site. It is all designed to help you shop smarter.

In this case, there are two ways you can use PriceGrabber. One is if you already know the product you are looking for.

In this example, we are looking for a Cannon PowerShot S3. When you put that in, this is the chart that actually shows up. You can see the product page, which includes the picture of the product, a short description.

You can actually look at detailed information, specifications for that products. You can see what other consumers think about this product. So these are reviews, user-generated reviews as well as what

professionals or experts think about the product.

All the information is gathered for the consumer to understand what the product is and what the feature sets are.

Beyond that, you notice this product is -- and I can't read it, I confess to you, from here, but you can see all the prices are shown here. It ranges from about 300 to over $500, over 48 different merchants.

Here you see a snapshot of those merchants. Actually, if you could see the whole page, this will continue and you would see all the 48 merchants that are selling this product.

So you will see that we have information on each of the merchants, their services, what they provide. We have the price, we have tax and shipping, which is computed based on the consumer's zip code.

So that gives you a bottom-line price. You can see we clearly identify what the best price is for the consumer.

The interesting thing here is over 70 percent of consumers or users of our site do not choose the lowest price. That is a pretty amazing stat if you think about it.

We provide information on the availability of the product, and these are user-generated reviews by the

consumers, what type of experiences they have had with this particular merchant.

This is where you can actually tap into some other tools where its allows you to sell your own product as well as the ability to set pricing.

In this case, say you are interested in this camera, but you don't want to pay over $300, your budget is 250. You can set that price, and we will check in background all the time. And when this target price is hit, we will send you an e-mail notifying you the product is available at that price.

So beyond that, you can also look at the reviews. Let's take a look at an example of a review. So in this case you can see the same camera and somebody has provided a review. I believe it is GeorgiaHuggieBear, or Deer, something like that. I can't read it quite from here. But it is a fairly new user.

I only have three minutes. I will speed it up. Here you can see there is quite a bit of information provided by this user, very happy with the result. But also very important to point out here is the fact that you can actually ask questions from this reviewer, you can rate the review. There is actually a whole set of discussion that you can have on this specific product.

Here's another way you can use PriceGrabber. Let's say you are looking for a digital camera but you don't know what. In this case, you will go into the photo section.

There are almost 800 different products here. And you can basically use these attributes to the left-hand side to narrow down your search. So whether you preferred a specific manufacturer or megapixel, you put those preferences in and we narrow down on the selection.

Basically, here we have selected three cameras, and we are going to do what is called a side-by-side comparison. This is what that looks like.

So here you can see side-by-side comparison of these three products, and actually this is again a partial page. There are I think over 30, 40 different attributes of these three products that you can compare right next to each other and decide what is the appropriate products for you.

So just to take it to another example, I hope -- there we go. So this is for fragrances. Again, the challenge here is just finding identical products and being able to do comparison shopping on those.

You can see the attributes are completely different for these set of products because it is not a

digital camera and the way you shop for them are different.

In this case, let's say we choose the most popular lady's fragrance on our site. You can see these are all the sellers. There is a rebate. You can see that is provided here.

People are selling, believe it or not, actually used or even testers of perfume. So we allow for that. We distinguish that and let consumers that are looking for this product know that that is available if that's what they choose to buy.

And then quickly, this is our travel search. Let's say you are planning to travel to Tokyo from LAX. Here what we have is all -- about 155 travel combinations that you can take to Tokyo.

Again, you have the attributes, if you notice, to the left-hand side. You can choose nonstop, one-stop. You can specify one specific airport or all the airports in the vicinity.

What is interesting and unique to PriceGrabber is that you have all these different amenities and information that's available on PriceGrabber. So, for example, on-time arrival of information or stats for each of the flights, believe it or not, leg room, what type of entertainment they have.

All that information, again, is gathered so you can choose what is the right flight or right carrier for you.

And then beyond that, and this is where it is completely different, let's say you are interested in that Delta flight. You can see we bring that same flight, same time from five different vendors, and the prices vary significantly from $600 and change to about 800.

Quickly you can do the same thing as hotels, again, slightly different set of criteria. You have star ratings that you can choose from. You can sort based on star per dollar. Once you choose a hotel, you will see various offerings for the same hotel room from multiple sources.

And that's it. My time is up. Thank you very much.

(Applause.)

MR. RAINIE: This is Mark Chandler, the executive vice president of sales and the chief operating officer of Autoland.

MR. CHANDLER: Hello, welcome. I wanted to say thank you to Liam and thanks for letting me be a part of this. It is some amazing people up here.

That was a nice presentation, Kam. I would also

like to say hello to the people via Webcast back in California, take advantage of this opportunity.

I have been with Autoland for 16 years as the executive vice president. We are a very unique and nontraditional way of purchasing a car.

I would like to take a few minutes to go through that. We have been around since 1971. So it is an older company. We have brick and mortar. We have some nice facilities.

We have 75 locations throughout the West Coast. We are exclusive to credit unions, although in California, Oregon and Washington, throughout those three states, if you live, work or worship, you are available for membership. I'm sure it's the case here on the East Coast.

We do about 12,000 cars a year, which if you ranked us, would be in the top 80 or so as far as car dealers. But we have really no inventory to speak of except for a small amount of used cars.

We do 75 percent new, and it is done very nontraditional.

The thing that I'm most proud of above and beyond the 12,000 is the about three out of 10 people that talk to us do buy through us. But I think that's just the net result of being a real service

organization. We are not just about selling cars. We are really about informing people.

Of the seven that don't buy from us I feel have had a real good experience and have the right knowledge so that when they do go out to a dealership and buy a car in the traditional manner that they will have all the information needed to make an informed buying decision.

I will go through these slide decks.

I wanted to just talk about our processes. These arrows on the left represent we work with over 300 different credit unions. That's just a sampling of them. Those arrows represent this.

I'm going to go through this fast because I know we are on some real time constraints here.

The credit unions, they market us through multiple channels. They can just directly come to us through a CU inquiry. We have a CU auto center as well that is set up on their Web pages, and it is a way for them to get information on the car they are looking for, information, pricing, availability.

They can also contact us via live chat. We have a call center that is several dozen employees that are available for live chat. We have an 800 number. Most of our offices are within the loan departments of credit

unions. We have actually set up shop in many credit union loan departments.

We centralized all of our inquiries to one central location for consistent response and to help manage all of our channels.

For those that come through the Web or through the 800 number, they all get the same experience, and our response time is very quick. It is amazing sometimes to watch it happen. It can be within 10 seconds, and it shocks people to have the phone ring after they punch the enter button just seconds later. As a matter of fact, a few times for those still on dial-up, the phone is busy so we have to try back when they are not on their computer any more.

Let me introduce you to AIME, the auto information management exchange. This is a program that came through years of technology buildout that lets us talk to each other through our dealer partners, through our credit unions, through our consultants and through our headquarters, our corporate offices.

It is a tool that allows us to know what is going on realtime for instant reporting, instant lead generation, just instant knowledge on what the business is doing.

Each credit union has a different value

proposition, and they need their own unique reporting. And with this tool we are able to do that.

All of the inquiries go to a highly trained consultant in our call center in the field depending on the member's requirements.

I'm going to go a little faster here. Our processes are very automated. To manage information and ensure the highest consumer experience, we have it down to a science. What is nice about that is if a large credit union enlists our services and we believe we are a service provider, it is a scalable model that we can take into other areas because we are all centrally located and automated.

We pull inventory from several different dealer partners and have the ability to transact them all electronically.

If you go our Web site, even on the used cars, there are thousands of cars that are not owned by us but by preferred dealer partners. We offer return policies, no questions asked. It is a nontraditional way.

There is not a lot of logic used in some of these things because we are really about the service and not the selling of the car.

The trade-ins -- my thing is not working right now. The trade-in process is centralized also. We

realize that most people have a trade-in. In fact, to me that's the best service that we provide because it is really more so, maybe, in other areas than some, it is a risk to sell your car on your own.

We really think it is important for you to take advantage of someone just taking it off your hands and not being burdened with the process of selling your car on your own.

Here we go. Anyway, we handle the process of this from A to Z, the entire thing from financing, insurance options to products. We have -- all the products that you can get in the traditional fashion you are able to achieve through Autoland.

It is a service through credit unions who are really about people helping people. Some of the products are GAP insurance, LoJack, mechanical breakdown protections.

There are all sorts of things you can get through this fashion.

Back to AIME, we do have the ability to access the inventories of multiple partners, and through this amazing technology we are able to, if someone decides there is a specific car that they want, we are able to lock it down for their benefit so that no one else would be able to buy it, even though they might be hundreds of

miles away. Sometimes it is the only car out there is the response we will get on occasion.

We do the final review of the transaction with the member. Then we deliver the car and they are on their way.

So it is really a no haggle, no pressure information service. As we serve people, the net result is that three out of 10 people buy from us. Even the seven that don't, they are better served because they didn't have to go through the traditional fashion which sometimes can be very scary.

And actually that concludes my presentation. So thank you so much.

(Applause.)

MR. RAINIE: Now we will here from Liam Lavery, the general counsel of Zillow.com.

MR. LAVERY: Good morning. Thanks for having me here. This has been a great panel to sit on.

I think one thing you realize in looking at these presentations and seeing these screen shots from all the sites is the trick with any of these shopping or research businesses on the Web is to understand the business proposition that the sellers have, understand the decision process that the consumers are going through, and that varies tremendously, depending on the

product or service that you are talking about.

Just briefly, a couple thoughts about the real estate market before I jump in. One, very few people actually buy their real estate on the Web these days, notwithstanding some valiant efforts by eBay.

So what most people are going to do is to find out as much information as they can. Real estate purchases are made on a tremendous, tremendous variety of information. There's a very complex set of factors that goes into making that decision.

It is hard to reduce that market data into things -- into a form that's easy to understand and operate on. The goods here or the real estate is not fungible. So comparisons are difficult.

Of course, there is no fixed pricing. So pricing information in general is a challenge.

So with that, let me present the idea behind Zillow.

Our founders, Rich Barton and Lloyd Frank, were fellows that were in it at the start at Expedia when it was part of Microsoft and then when it became an independent company. They for a long time had been thinking hard about consumer Web services and how to solve the problems of consumers.

They left IEC about a year and a half ago and

were thinking about what they wanted to do next. They knew it wanted to be in the consumer Web space.

Happily for me, they both at the same time were shopping for homes. They are very analytical guys. They wanted to have as much information as they can in their hands, put it in a spreadsheet, play with it, try and figure out how much their house would be worth, how much the house they were looking at was going to be worth.

The thing they found was there is no easy way to get that information. There are a lot of public data sources and private data sources, but it is hard to bring them together and manipulate and understand and work with that information.

So that consumer need is what spurred this company. They realized that they were problems that hadn't been solved in the online real estate space. So that led them to this mission, to empower consumers with real estate tools and information, help people make smart decisions about real estate.

So this is the Zillow home page, if you folks have been there before. And the general proposal is up there at the top, free instant valuations and data for now actually 68 million homes.

There is small type underneath there that is

hard to read but is also part of the value proposition, which is "and you don't have to enter any personal info and no one will contact you."

The history of the real estate online business has been a lead generation model, taking consumers to professionals. There is definitely a consumer service there. The vast majority of consumers use professionals in making a purchase decision.

But not everybody wants to start there. Our proposal was to give information about the marketplace without having to have a sales contact with a professional.

So you input an address there, hit a button and move to a page like this, a very data-rich page, hard to see from a distance, but if you have been to our site, you will know this search results page gives you an aerial view of the neighborhood. For most places, we have satellite views. It overlays on top of it a map.

If you don't have satellite views, we will give you just the map. And then lots of little boxes there are the parcel boundaries for home real estate. This is in the middle of Seattle.

And then that little bubble is some detailed information about the home that you searched for. It tells you our estimate, and that is our automatically

generated valuation that we run based on public record data that we have about a house.

It tells you a little bit about some of the public record data. It gives you beds and baths on this page and a bunch of links to click to for more information.

A recent thing that we did in response to some consumer complaints or concerns is that we realized that the public data is not at all perfect.

So the very first thing that we decided to make a major upgrade to the site with was in September, we allowed users to claim their own home and to correct the data. And that's been actually quite well received by our users so far.

So this is an example. The left-hand column here shows home facts that are off the public record and it shows our automated valuation that's based on that set of facts.

And then next to it is when the homeowner selected to claim the home. Then they put in all this information about what the true facts are about the house, at least true as reported by the owner. And then this owner decided to run their own estimate using our valuation model.

So generally we let people know all over the

site that we are not able to go out and verify this information. But what we try to do is on the theory that more information is better than no information, we just make it really transparent where this information is coming from and let users do with it what they will.

So this is the home details page now with all the new features in it. On the left-hand side is the Web page you get to when you click through from that original map.

We had been looking at this little box down here in the corner. The blow-up here on the right-hand side is what we give to the owners to fill out their own estimation model and to justify why they would offer this house at a different price.

This is a little bit just to very briefly say what kind of reception we have had so far. We launched in February of this year. At this point we are the fifth largest real estate Web site hit-wise based upon a couple of other real estate players.

We had 3-1/2 million consumers come to the site in October. 27 million homes have been viewed out of the 88 million homes in the country. And 171,000 homes have been claimed by owners as of last week.

The last thing I wanted to say very briefly is a question we often get is how do we make money. We are

still working on it.

But this slide based on a Forrester research report from last year is probably the most popular slide in tech circles these days, right. What we are trying to do, as many other people are, is trying to exploit the difference between how much time users are spending online as opposed to how much advertising money.

Our model is entirely advertising based, based on the suggestion that Google has made, that if you get consumer information right and pure and trusted and you get people coming back to your site to consult you for that consumer information, then you can sell contextually relevant advertising around the outside, keep your information pure but still have a viable business model.

That's it today. Thank you.

(Applause.)

MR. RAINIE: Jeff Fox, the technology editor of ConsumerReports.org.

MR. FOX: Good morning. Thanks for having me here. Thanks, Lee.

First I would like to ask people how many people here have ever used Consumer Reports magazine, the print magazine? I see a few hands.

And how many have used our Web site? Quite a

few.

I was going to say it looks like a lot of people are familiar with the site. I was going to say forget about most of what you know about Consumer Reports, except for our integrity, because we are reinventing Consumer Reports for the 21st Century and creating a research source and information source for consumers on the Net using the latest technology.

Here's a little background. We started the Web site in 1997. We now have about 2-1/2 million paying subscribers. Subscription I think is about $25, $26 a year now, although you can subscribe by the month for about $5 if you really want to research something short term.

Subscribership has grown in the past at about 20 percent per year. We are pretty much the largest publication-based subscription Web site in the U.S., possibly the world. And we have 3.3 million unique monthly visitors.

Consumers Union, which publishes Consumer Reports is a nonprofit organization. We are noncommercial. The only ads you will see on there really are our ads for our own products, our own commercial ads.

Our content includes magazine features -- this

is on the Web site -- reviews, ratings. We are beginning to add blogs, message boards, daily news, interactive tools, videos.

We now offer -- our mission is similar to the mission -- although we haven't been around quite as long -- we are celebrating our 70th anniversary this year -- our mission is to protect consumers.

We have a free blog on Consumer Reports on safety, where we provide information about safety problems. We also have a free site, Best Buy Drugs, that provides consumer information about the most widely used drugs, a subscription site, MedicalGuide.org, where you can get information about conditions and treatments.

Yesterday, for those who were here yesterday, there was some discussion about whether people are actually getting a lot of their information now from user-generated content and blogs on the Web.

Here's what one observer said, giving us a compliment, I guess, that people are turning to blogs. And he is right from a number of points.

User-generated content is getting more attention. But some of the latest research shows that it is not entirely right and that people are still trusting brand and media reviews.

If you look at the age breakdown here, you will

notice that younger adults are right in the forefront there in trusting branded reviews and company information and that the blogs and the opinions are somewhat down on the list there, showing us that a brand and a reputation still matter a lot.

This is the recent home page of our Web site. As I said, it is not your father's Consumer Reports.

We have retooled for the Web. We are starting to offer RSS feeds. There are lots more planned in the coming years.

If you look on there, it includes virtually all major products and services.

Here's one of the new things that we are offering. The traditional issue with Consumer Reports in the past was that you find a product and then you go there and perhaps it was too new or the subject in the magazine was dated.

We are current now. We are very current. When new products come out, we get first looks, short assessments of these products out there very shortly after the product comes out.

We are now offering some video first looks. You can get on there -- thinking, for example, we have some up recently of some of the digital SLRs that have just come out since Labor Day. They are up on the Web site

already.

We will soon be offering things like Podcasts as well. We are really exploiting the Web.

This is our pride and joy. This is a new thing. If you remember Consumer Reports, you have those little circles which internally we called blobs, for lack of a better term.

We now have a proprietary software called a product selector which actually turns those old static rating tables into a dynamic interactive database.

I don't know if you can read it up there. For example, you can select a blob level, the red or the half red, and if you see the little slider there, then you can narrow the ratings table down to just those products that we found were, let's say, very good or excellent. And you, using that, you can set criteria levels of other columns there. You can also sort on columns.

This really turns what is a traditional, familiar, static printed table into a 21st Century tool.

Also our -- when you find a particular model that you are interested in, you can drill down to it. Our engineers spend countless hours -- I have seen it -- cataloguing -- we call it pedigreeing -- products, every little nook and cranny.

The products are tested scientifically in the laboratory. So you know all the research on something. They are really tested in the lab scientifically.

And user content, first of all, we like to say we have actually been using user content at Consumer Reports for decades.

Our annual questionnaire that goes out to perhaps something like a million people now is the source of all those charts you see about which cars have been reliable or less reliable.

If you look at the bottom of this slide here, you will see that we do all sorts of surveys of consumers. We have incorporated consumer experiences into the magazine for, as I said, decades, subscribers and also general public service.

Another aspect of using the Web is the community. We are now expanding the number of online forums where consumers can share experiences and reviews. Our experts will participate there. And you know that these forums -- we found that the people that participate in this really often have a lot of expertise, they are very high caliber.

It is a secure environment. You know that we are being careful, monitoring what is being posted there. It is a draw because people know they go there,

there's going to be quality.

You can find people online that are as knowledgeable as some of our experts. You have engineers and other experts in the subject coming there and talking about products, but, of course, giving their own assessment.

We are starting to introduce user reviews separate from our own tests. This is an example of some of the reviews. This is all from the real site. This is not a prototype.

We offer a new car buying kit -- I think it is about $14 -- which will provide a consumer with information about the car's reliability, the dealer cost and negotiating strategies. We are really working to inform and protect the consumer solely. That's who we answer to.

I want to mention, since the cars are up here, that a question that has been posed to us are whether people are doing more research on big ticket items or every day items on the Web.

Our experience, talking to our Web people, has been it is pretty much equal. It really isn't at all based on price. It is relevantly driven on what's hot or in some instances what requires more thorough research, such as a safety issue or a complex or

unfamiliar topic. People may do as much work online on a supermarket item as they might do for a TV, depending on what's hot.

In summary, we are a complete resource for consumers. And this is what we consider to be the 21st Century consumer information source.

(Applause.)

MR. RAINIE: Again, I'm sorry and she is sorry. Sucharita Mulpuru from Forrester Research, a senior analyst, is not here to present her data.

So I was going to make an attempt to do that, in part because it lines up very nicely with the kind of material that we see in the Pew Internet and American Life Project.

You are hearing about all different kinds of ways that consumers are gaining new benefits. They are gaining new power, access to information they didn't have before, gaining ways to participate in consumer culture and producer culture that they hadn't had before.

The Forrester data is sort of rich in detail about that. There are a lot of people who do research online before they buy products, and there are a lot of people who are buying products now, even though, if you look at the whole retail market, it is still a drop in

the bucket compared to the number of purchases that are actually made in stores.

It is a blooming, thriving market. The upside for growth still is pretty large. There is lots of information about the kinds of things they want to buy.

One of the most striking things about this chart is that you can see the extra increment of research that is taking place compared to the purchases that are taking place.

In other words, seven points more people have done research about books online than have actually bought books online.

Of course, when you get down to some of the bigger ticket items, they are doing a lot of research about those items but making those purchases in many cases off-line in a store.

Forrester is doing a terrific job identifying heavy shoppers, people who go online when they are looking for material and using three or more sites to do their research.

Not only can they find research material on individual sites, but they are also going to multiple Web sites just to triangulate the information they are getting.

They are doing research at a tremendous number

of places. In many cases, this is Pew data. I'm not sure if it is Forrester data, but I bet you they find it too. They are starting at search engines and finding the sites that they need for sort of general search queries.

And this is the array of things that they are doing online. This is also the kinds of sites that they are using and the kinds of ways they are using these sites.

Again, all these slides will be available from the FTC site. They are all sort of hard to read here. They are using a rich menu of Web sites to go through.

They are posting a lot of content in many cases. They are contributing to the flow of information about consumer goods online. But they are also skeptical.

Many people approach their retail purchases online with a sort of healthy degree of skepticism about whether the information they find online will be accurate, whether the brands they encounter will be accurately represented.

They know there is fishing in some respects. They know there are fake sites and stuff like that. They are pretty not necessarily vigilant but sometimes they are quite serious about understanding the flow of information and getting enough information so that they

can feel confident to make a purchase online.

So that's kind of the Forrester picture. Buyer beware is a major message here.

I was going to ask the panel a question to begin our conversation here about changing consumer behavior. We have seen a lot of ways consumers access this material.

There are some people who have certainly lived in a consumer world that predated the popular adoption of the Internet, which a majority of Americans began to use the Internet around 1999 or 2000.

Before then, it was a novelty. It was the province of sort of geeks and people who had a specialty interest. And it became a popular consumer technology really only about five years ago.

For my money, there are four things to think about that make for different consumers now than before.

First of all, as you have heard from these sites, the boundary between online and off-line is now very permeable. Many people do their research online, they do their price shopping, window shopping online, but then make their purchases off-line.

In their minds, it is not necessarily separate space anymore. These are just part of the tools that they have that they bring to bear to make consumer

purchases.

The second thing is consumers are themselves in the producer end of things in that they are posting comments, assessing comments and contributing to the online environment. They are not just on one side of the transaction anymore. They are contributing to the conversation from the sales side as well.

The third big thing is, of course, the volume of information available to them has grown markedly. There is a lot more inputs they can gather up, a lot more consumer commentary they can gather up.

The fourth thing is as that volume of material has grown, the important point of those last Forrester slides, as more inputs come into people's lives, one of the things that happens is when they reach the oversaturation point, they draw on their social networks more or they draw on their trusted brands more.

It is just as word of mouth and the sort of value of trusted brands grows and that is information rich and where the scarce resource in the modern age is attention rather than information, information is abundant now.

I was wondering if any of you had other thoughts about the specific changes in consumer sort of attitudes and behaviors that have emerged in the Internet age.

MR. CHANDLER: It seems to me that where a few years ago, it was really about price, just about price and the opportunity to find the right price on things.

I'm sure some of you have the same experience that I have, where you buy something online and the price is the best but the experience is a disaster. It comes late, it has a battery that won't charge or something like that, it is a refurbished product.

I think what I'm seeing is a trend toward value. If you look when you comparative shop, which is wonderful about these sites that we have seen, is you have the ability to compare pricing. And you don't always buy the best price because you go with, what you said, the brand.

I think people are looking more towards value than just price. The idea of commoditising all these things is there is still service behind this even though it is Internet and there is not a lot of human interaction, they are still looking for some place where they can get a good value.

MR. POURZANJANI: Just as price is important, hence PriceGrabber. It is a big criteria for all consumers when they want to make a selection.

As I said, we have been in business since 1999, and our value proposition is quite clear. But still, we

never saw that people just flock to the lowest price. It was always about matching the consumer with the right seller.

This is a trend that we have seen for many, many years, and it has been well over 70 percent of consumers not choosing the lowest price. That is very consistent with our experience.

MR. RAINIE: I'm interested in the problem of bad information, particularly in an environment where your competitors and any other user with a modem can post information that isn't necessarily true or accurate.

Can you talk a little bit about the ways that you are coping with that?

MR. POURZANJANI: Sure.

MR. LAVERY: I will take a shot. Our site is based on public record information which is generally selected by tax assessors who have often limited access to the properties that they are trying to get information about.

I guess that the main value proposal that we are making is that by making this information available to people and letting them interact with it and make their own judgments, take a look transparently and see what's behind the assumptions there, and, in fact, often

relying on other people in the community to correct it, that that's an environment that people are going to like and get some benefit out of and keep wanting to come back to consult.

I didn't answer that previous question about what consumer behaviors have changed. I really think in the last 10 years consumers have gained a lot more tolerance and patience for sorting through data and finding the gems and sorting out the stuff that they don't think is relevant to their own decision.

I'm curious about what consumer reports thinks on this since you have been a trusted source for some time.

MR. FOX: We are not a shopping site. We refer people out to shopping sites we don't have a financial relationship with as a convenience.

We don't really know what people end up buying. So we are not tracking the purchase behavior.

But clearly our development of this product selector shows we have searched the Web. We see what's out there. This is exploiting the medium. People want to be in control. They want to be able to see different -- see the information they are looking for and really zero in on things.

MR. CHANDLER: Accurate realtime information is

essential, I think, for these companies, that you guys all have accurate realtime information. Otherwise, you won't last very long. Consumer experience is so important that it is essential.

MR. POURZANJANI: Absolutely. We update our site six times a day minimum to make sure the inventory, the pricing is correct.

Going back to user-generated content, if you will, that is a big issue these days, that you have a lot of junk content out there. There are a lot of motivations to do it.

I can spend the whole day talking about those motivations, including people vying for search engine optimization, so on and so forth. We found early on the only way you can do this is really to monitor this closely.

When people generate content on our site, we take a close look at it. We have technology to do it and people to do it.

Beyond that, the community itself is a great policing tool. And they look at the content that is provided, they rate it. If there is a problem, they highlight it.

That is a big, big issue. I think the solution is with the community that you build around your site.

MR. RAINIE: Here's a question from the audience for Mark and Kamran. How do you make money?

MR. CHANDLER: That's a great question. I guess I didn't address that.

Of the three out of 10 people that did buy from us, there is a margin in the purchase. Between the price the dealer sells us and the price we offer to the consumer, there is a margin.

Because we are doing over a thousand cars per month with our buying power, even with that margin, I'm not saying we are the best price, but we are a very good value and probably better than what you can do on your own unless you are one of those Mr. T guys and can work a great deal.

MR. POURZANJANI: It is a great question.

We make our money through two ways. One is advertising on our site. We have very, very many light advertisers. The site isn't overburdened with a lot of advertising.

The main source of revenue for us is referral. They search for the product, help to find the right merchant. And when they click through the merchant site, we collect a nominal referral fee, 10, 15 cents, all the way to close to a dollar.

We don't care typically if the consumer buys or

not. We are not motivated by that. We do care; we want them to be buying, we want them to be using it for that purpose clearly. But we are not motivated by making fees that way.

MR. CHANDLER: Can I make it clear real fast there is no fee to use this service.

MR. FOX: I was wondering if I could just raise the question of security of Web sites because there has been a number of incidents of people's credit card numbers being disclosed.

I got this too late for the PowerPoint. We did a nationally represented survey about people's concerns about shopping online. 72 percent said they were concerned about the security of their personal and financial information. And of those, 86 percent had taken precautions, secure passwords, shopping at well known sites, printing and saving receipts.

Only 64 percent said that they always use the same credit card online, which is a common technique. And about 70 percent review the site's privacy policy. So that that leaves 30 percent that don't. That's another issue besides the reliability of pricing, is the security.

MR. RAINIE: Here is a question I'm sure Lee gets all the time. Homes in my neighborhood that have

recently sold anywhere from a month to a year ago are listed on Zillow at 50 percent of the sales price. Why doesn't the sales price have a greater effect on the estimator?

MR. LAVERY: Our algorithm has a bunch of different inputs. Past sales are a significant influence on them.

One thing to realize, at least at this kind of beta stage of our Web site, is that sale price may be associated with a bunch of attributes on the public record that may not in fact be reflected in the house that actually sold. So that is a common cause for those kind of situations.

Here's one that I know that we have had trouble with. If a condo is listed on the public record as having zero square feet but there is a sale on the record for $300,000, our algorithm right now has a hard time picking that up.

As we go along, we hope to get both better data sources as we go out and look for them and also get some help from the community to improve those outliers.

MR. RAINIE: Here's a sort of meta question about the new age.

All of the industries represented up here are regulated based on the concern at some level consumers

could not get adequate information to make informed purchases. Today many technologies provide this information and make these industries a lot more transparent.

The question is should these industries be deregulated and should we allow new efficient services to offer autos, homes and other services for sale.

MR. POURZANJANI: Competition is always a good thing.

If you look at PriceGrabber, which is more commodities or products that people use on a daily basis, obviously that's not that regulated. You can see that competition has really worked and the consumers benefit from that.

Essentially I think that's a model that could be applied to many different areas. There are concerns. Security is one. Again, I think Internet gets a bad rap on that, personally.

I understand the number one source of security problems is actually when you give your credit card to somebody at a store to run your charge, so -- whereas, you have actually a lot of security through your credit card on the Internet.

So I think there are other issues that need to be regulated. Security is one. I'm not sure if running

a business itself needs to be regulated.

MR. CHANDLER: I think the auto industry, there are still a lot of people out there are probably not following the best practices. I think regulation is okay.

MR. LAVERY: I think in the real estate space, it is actually quite regulated at the state level. There is a lot of good consumer protection that comes out of that.

I think this is kind of a time of blossoming of many different innovators in the online real estate space. I think consumers will benefit if those information services have a little bit of room to breathe as they figure out what it is that solves problems for consumers.

MR. RAINIE: Is this your shot at the FTC?

MR. FOX: The privacy issue, as the FTC knows, there has been privacy disclosures, not necessarily in these industries, but that's a big issue on the Web also.

There is still a role for regulation, I think.

MR. RAINIE: One-sentence answer to the last question from each of you, starting down the line from Jeff.

What gives you night sweats about this space?

What do you lie awake thinking about that could go disastrously wrong?

MR. FOX: I don't know. The Web site crashing, I guess.

MR. POURZANJANI: I think we are in a space that you are sort of making up the rules, for lack of a better term.

All these Internet businesses, we are creating something new, trying to be more effective and be more useful for consumers. That leaves a lot of room for a lot of sites to go up that misuse the public trust.

And the problem is that consumers may walk away thinking all the sites are the same and all of them are engaged in something that's less than perfect, less than whole.

I think one example is spyware. My company, PriceGrabber, we have never worked with spyware companies. We have never done business with them. But a lot of companies have and therefore made an industry out of that.

That is all going away. But that type of trend could work against the Internet and all the players.

MR. RAINIE: How about you?

MR. CHANDLER: Just the thought of someone going through the traditional fashion and absolutely getting

beat up. I have seen some really horrendous purchase orders come through that really keep me up at night.

MR. RAINIE: And Liam?

MR. LAVERY: The big worry for us in this brand-new space is what we are planning on doing and what we are already doing, what consumers really want.

We are guessing. We have several more things coming down the pipeline. We have to get it right. Our whole business model is on whether consumers decide it is worth coming to take a look.

MR. RAINIE: Thank you very much for a great panel.

(Applause.)

(Break and technology pavilion.)

MR. WIESER: Thank you so much for coming out to our panel on marketing and advertising in the next Tech-ade.

I'm Brian Wieser from MAGNA Global, one of the world's largest advertising agency holding companies. We work very closely with agencies, universities, media and others.

We will start off this panel with some introductory remarks from Commissioner J. Thomas Rosch.

COMMISSIONER ROSCH: Good morning. I'm Tom Rosch. I'm pleased to be able to offer some

introductory comments, albeit through the magic of videotape, to open this morning's panel on marketing and advertising in the next Tech-ade.

I would like to start out by highlighting some of the types of issues that confronted the FTC's Bureau of Consumer Protection in the early '70s, when I was a BCP staff member.

During that period, one of our top law enforcement priorities was to target national advertising that we thought was either false or unsubstantiated. Those were high-profile cases that communicated the message that the cops were on the beat.

The remedies we sought were so-called all-product orders that would serve as a basis for civil penalties if the respondent ever engaged in false or unsubstantiated advertising again, regardless of what product it advertised.

The Commission also used its rulemaking authority during the '70s, issuing rules to regulate marketing practices in a number of industries.

We were also interested in protecting children. Back then there was a concern about the large amount of television advertising directed to young children, especially by so-called host sellers, that is to say, characters from children's programming who advertised

the sponsor's products.

The Commission also explored a possible rule restricting the advertising of sugary foods to children, but ultimately terminated the rulemaking in part because although the record showed some cause for concerns, there didn't appear to be a way to develop workable rules to address those concerns.

I should also point out what we weren't concerned about. For example, back in the early '70s, two of today's biggest consumer protection issues, privacy and data security, weren't even on the horizon.

Now fast forward to the mid-1990s. The Commission held the first set of hearings on the high-tech global marketplace which focused primarily on communication technologies, the telephone, television, computer and Internet.

The Commission successfully predicted many changes that these technologies would foster, things like the unlimited amount of information that would be available to consumers, the development of a global marketplace and dramatically improved shopping convenience.

At the same time, the Commission didn't see coming a number of things that have adversely affected consumers and their welfare, namely spam, spyware and

data security vulnerabilities.

Another development that was underestimated and that's changed the way some of us experience life today is the extent to which people can now create and share content by using technologies like the computer, telephone and Internet.

Things like chat rooms, message boards, blogs and social networking sites have affected the way that people communicate with each other and share thoughts.

Broadband and high-speed Internet access allow people to share digital photographs, music and video to an extent and in ways that were almost unimaginable 10 or 15 years ago.

It is also worthwhile to note that those technological innovations may come with price tags, privacy implications and copyright issues just to name a few.

So the question now is what's the future of consumer protection in this arena? It's first essential to identify some of the underlying technologies that are going to propel us forward in the next decade.

Broadband and high-speed Internet access will continue to be a major mechanism for communication and the distribution of content. Already we have seen the deployment of voice over Internet protocol, or VOI P,

and the dramatic popularity of the video and audio sharing capabilities of Web sites such as YouTube and MySpace.

Hand in hand with this technology comes the freedom of wireless communication. Other technologies, such as radio frequency identification, or RFID, will continue to develop to offer a broad scope of consumer and business convenience and benefits, such as payment processes, inventory tracking systems and identification mechanisms.

So what are the underlying consumer protection issues that we will need to be concerned about in the near future? Most of them are the issues that we are grappling with now and have grappled with in the past, basic fraud and deception, privacy and data security, the importance of informed consumer choice and protecting children.

Fortunately, in many instances our traditional methods of addressing consumer protection issues will continue to serve consumers well. For example, law enforcement is an important tool that we will continue to use in our fight against deceptive and unfair practices whatever form they may take.

Additionally, education will remain an important component in the future of consumer protection. And by

education, I refer not only to the agency's efforts to educate consumers but also to its efforts to inform policy makers and legislators.

Last but not least, it is important to recognize that some of these emerging consumer protection issues will best be addressed through self-regulatory initiatives or by private sector participation in our educational efforts.

But the development and deployment of new technologies will also pose some new challenges for us.

For example, monitoring advertising and marketing is a bread and butter investigatory technique used by FTC staff. In a growing media universe, that's a daunting task.

Today, advertising shows up not just in television commercials and print ads but on Web sites and through pop-up ads and on cell phone screens, in e-mail and text messages and through specially targeted ads that only reach a specific audience.

In addition to all these new outlets, there are also new types of advertising and marketing, things like buzz and viral marketing or the consumer's the one who passes on the commercial messages to other consumers.

Another ongoing challenge will be the increasing participation of children and tweens in the marketplace.

Kids today have an array of interactive electronic devices and access to technology with which their parents may be quite unfamiliar and, I should add, also their grandparents as well.

Of course, kids aren't the only vulnerable audience. Consumers in businesses that are unfamiliar with new technologies may need special attention. For example, there's a growing problem with unsophisticated sellers and business entities who fail to properly safeguard consumer information.

Finally, globalization of the marketplace continues to pose an ongoing challenge in the consumer protection arena. Using Internet and long-distance technology, unscrupulous businesses and spammers can strike quickly on a global scale, victimize thousands of consumers and disappear without a trace.

We will continue to work to get the U.S. Safe Web Act passed in order to address the challenges posed by the globalization of fraudulent, deceptive and unfair practices.

To wrap up, although we have many tools at our disposal, we need to continue to keep abreast of new and emerging technologies, work with other government agencies as well as private sector entities and develop and fine tune our responses to this constantly changing

environment.

Thank you for your input.

MR. WIESER: Thank you Commissioner Rosch.

First of all, thank you as well for coming to attend. I think you will be in for a very interesting series of discussions here as we have some of the leading experts in some of the leading-edge technologies and methodologies for marketing going into the next decade.

Maybe I will just begin by introducing everyone. We will start off with some comments from our first panel's panelists and then go from there.

On the first panel we will be talking about behavioral targeting and other search trends, among other topics.

From Acxiom, it is Jennifer Barrett, chief privacy officer. Next to her is Eduardo Valades, president of iHispanic Marketing. To my left is Dave Morgan from TACODA.

On my right side, Brian Stoller from Third Screen Media. We will be talking about mobile marketing in our second segment.

To his right is John Greco from the Direct Marketing Association. And to his right is Marcia Hofmann from the Electronic Frontier Foundation.

So without further ado, I guess we would like to begin with the first presentation.

David, you are first. My apologies.

MR. MORGAN: Good morning. I'm certainly excited to be here and excited that so many people are focused on what our industry is seeing and what our businesses are projected or expecting over the next 10 years.

It is fun to do that because so much of the time, as someone who runs an advertising business, we talk about the here and the now. It is nice to step back sometimes and try to think a little bit more about what might happen and try to anticipate some of the issues.

To give a little background of myself and my personal biases, I'm in the advertising business. So that will certainly color most of the things I say and probably biases a lot of my perspective. But it is always good to put that out there.

My company, TACODA, is based in New York. We are a five-year old company. We sell advertising that is targeted to consumers according to anonymous browsing behaviors to try to determine the most relevant ad.

I will give you a sense of what we think the next 10 years might have in store for us, both as

consumers and as an industry.

And my perspective on this has been colored from having been in the online advertising industry now for more than 15 years, since about late -- in 1990, 1991, well before the Web.

So I do think, though, to get a sense of what we will probably see in the future of advertising, it is helpful to look at what is happening on the Internet today because that will give us an example of what we are going to see in television and in mobile and probably in other personal devices.

I think we are going to see more and more news and entertainment information be digitized. That's happening. The days of analog content or analog content only, content existing in analog forms as it did historically will go away.

We will see many analog forms of content we receive, we will still get newspapers and still receive signals sometimes broadcast in analog. We do expect to see, certainly within 10 years, all the news and information, entertainment that consumers will be consuming will be digitized.

That means a few things will happen, particularly in the advertising world. That means that the place and the time and the method of consuming the

information is now going to change dramatically. It can shift. It can now be on demand to consumers.

It means that the information delivered now can actually be addressable, there can be some understanding of who is on the other end of the information.

In this business, I'm particularly focused on the next one, which is we are going to expect that almost all of it will be measurable, that it will be possible to know what information has been delivered and how it has been reacted to. And it will also be interactive.

There is now going to be a capability for consumers or the recipients of information to actually engage in it, to interact with it, to make it more information that they are interested in.

This is really what we have seen over the last 10 years in the Internet. As we see digital networks take over in other parts of media, we expect to see the same things.

What do I think this is going to mean? This may be a bit controversial, but I think it is fair.

I think we will see more and more information becoming available, more and more news and more and more entertainment. But I think almost virtually all of it will be advertising supported.

We will see a dramatically different business model than we have today, where magazines are 50 percent supported by advertising, where newspapers are 20 or 30 percent supported by subscription fees.

We will see more information available to more people. We will see lower cable subscription fees and less access costs.

That's going to put a lot of pressure on the advertising world. That will put a lot of pressure to come up with higher values of advertising and more relevant information.

One of the difficulties as advertisers try to better understand consumers and truly get to our Holy Grail over the next 10 years, which is to give people ads that they want, is going to be able to understand what their behaviors are and how they are interacting with advertising.

We will see a lot of advertising delivered through techniques such as my company is involved in called behavioral targeting, where you can anonymously understand what kinds of content people are consuming to give them more relevant ads in their browsing experience.

People who have been consuming content about automotive purchases can for a certain period of time

several weeks following may receive a higher proportion of automotive ads. If that's more relevant, we are going to see more response from the consumers and hopefully greater value.

With that, of course, as all of you know, comes a lot of issue around privacy and a lot of issues around protection of consumers, what happens if this information is used incorrectly.

These are the areas where I think the industry has taken a lot of proactive steps. We have had for a number of years the NAI guidelines in how to deal with anonymous or personal identifiable information. We are now seeing new proposed guidelines for dealing with cookies.

I will tell you the steps our company has been involved with. We think this is going to continue to change as we learn more about the consumers.

We are actually taking a lot of steps working ourselves, working with the NAI, the industry trade organizations like the Interactive Advertising Bureau to better codify the best practices, and those are things like only using anonymous nonpersonal identifiable information.

That means giving notice not only on the Web sites of the companies but on the Web sites of

publishers where users browse.

In the case of TACODA, we are going to go further now and start giving actual notice with tens of million intake and admin from our publishers to try to make sure that consumers do understand what is going on. It means giving choice and protecting choice and safeguarding choice and being sure that when a consumer opts out, they have the opportunity and it is protected.

It also means avoiding targeting advertising according to sensitive information, whether it is anonymous or not, particularly in medical conditions, sexual preferences and things relating to children and teens.

So I'm excited to be able to have this opportunity to be able to engage more with those of you who focus on these issues to make sure as this industry evolves, we understand the importance of consumers in this process.

Thank you.

(Applause.)

MR. WIESER: Eduardo Valades from iHispanic.

MR. VALADES: Thank you. Thank you, everybody, for having me here.

I'm excited to be here. I'm here to talk about search and also search with a specific market, the

Hispanic market.

Let me show you the slide presentation. Here you have an overview of the history of the search engine and search engine marketing.

Here is where the newer started. This is where we started the push market, the pull marketing and we are starting to hear more of the pull marketing, pull marketing. That's what search engine marketing is.

It's knowing what the consumer wants and targeting that consumer. So we are getting into the, as John Battle said, the database of intentions. We know what the consumer wants and we are trying to target to that specific need.

IHispanic did a research group company called GMI this year, and we asked around 9000 people in 21 countries, in Latin America, U.S. Hispanic and general population, what are you using the Internet for.

Number one was e-mail. We are very close to it, and almost exactly the same number in the three categories we see here we searched. After e-mail immediately is search.

Then we asked what search engine gave the most relevant results. This is not penetration but relevant results. Overwhelmingly we saw Google there in Latin America take a lead there in the relevant information

they were receiving as well as in U.S. Hispanic and general population.

We also asked about the search experience under software. This again is search experience, not penetration.

Now, we asked what are you looking for in the search engine. Number one was, of course, information. Second one was products, music.

You see the amount of music people are looking for in Latin America. The amount is really very high.

Local information and in the side of maps, we see the line there of Latin America really small compared to the other ones. There's not enough maps of Latin America available like Mapquest over here. But it's going to happen. The trend is going to go that way. That's why we don't see as much search of maps in Latin America, as well as local information.

Where those search engines are going, they are going all those places. It is really evolving. We are looking at the tip of the iceburg of what is going to be with the search engines.

I can tell you a few pointers, personalized, video and music, maps and earth, visualization, book search, local search and, of course, mobile search.

I want to talk about mobile search. For

example, I will grab a number from Mexico. There is around 17 million people using the Internet in Mexico and there is 44 million cell phone subscribers. So there is a big opportunity there in mobile for places with high use of mobile devices.

Of course, social networking and advertiser tools -- I have a minute here.

This is again where the search engines are going. I'm going to go really fast through them.

General rated content, pressure from the time there. This is not working. Microformats. Mobile search growing a lot, social search, RSS, tagging, user generated content, social media and syndication.

And as we always say, don't just target to Hispanics, target as Hispanics.

Thank you very much, and thank you for coming in.

(Applause.)

MR. WIESER: Next up is Jennifer Barrett from Acxiom.

MS. BARRETT: Thank you, Brian.

I want to thank the FTC for holding these hearings. These are complicated issues and they warrant discussion and debate.

Harry Truman said there is nothing new in this

world except the history you don't know.

Since I certainly feel like something of a relic in this crowd, having spent 30 years focused on helping customers understand how to do target marketing effectively, in the last 15 on the consumer privacy side, I have had the pleasure to watch the industry grow and mature while I advise clients on approaches to maximize their marketing efforts while evangelizing good pricing practices.

My objective is to share a little bit of history with you in the hope it will help us understand not only where we are today but where we are going in the future.

Acxiom provides some of the largest and most sophisticated marketers in the world of information service, augmented with products to help them efficiently market and to prevent fraud.

We also actively participate in developing and promoting best practices relative to the use of personally identifiable information, which helps maintain the confidence of consumers.

This title is about behavioral marketing and while we have been thus far talking about targeted ads and Web site personalization based on Web site behavior, I submit that marketers have engaged in targeted marketing based on behavior for a long time, long before

the Internet.

And there is history and good practice there that you may not know about but I think could help us both understand and predict the future.

You have heard about all for the last day and a half lots of new technologies and how marketers are adapting those technologies to better understand who is more likely to be interested in their products and who will respond.

Marketers are adopting these new technologies at phenomenal rates. While the interactive space is moving at a much faster pace than the off-line world, I hope to show you we are heading in very much the same direction.

Over the last 40 years we started with mass mailings based on little more than geography as a predictor of consumer interest. Next, in the '60s and '70s came prospecting based on purchasing behavior using rented lists from other companies for one-time use.

This was a significant step forward because the targeting was better when we knew something about past purchase behavior and allowed us to better predict future behavior.

Then in the '80s, we deployed geographic clusters at the zip code level based on census information to add to the purchase behavior.

This provided another incremental step because it offered more intelligence about what we understood about the geography. However, geoclusters still averaged large numbers of households with very dissimilar characteristics.

Consequently, the more sophisticated marketers realized that there are a few special household characteristics that were very predictive of interest and behavior. But acquiring and using these variables was expensive and typically limited to sophisticated companies who could afford statisticians.

It was during this time that the best practices which we all embrace today around the concepts of notice and choice were initially developed and implemented.

In 1991, when Acxiom expanded from just providing computer services to also offering information products, we recognized we needed rules about what was appropriate with using PII, and I was asked to step into the role of chief privacy officer.

From the beginning, we understood that we must achieve a balance between the benefits that we talk about the business enjoying and the concerns that consumers have in order to maintain an adequate level of trust.

To that end, over a decade ago, Acxiom was one

of the first companies to ever post a privacy policy covering all of our off-line and online practices, offering the consumer notice, choice and access.

We were very active developing and evangelizing industry best practices in these areas.

During the '90s, it became economically and technically feasible for more granular information about households to be collected and used.

We began to combine sources such as public records with survey data volunteered by the consumer and in some cases information from customer files who had historically rented their customer lists for marketing and had already dealt with the notice and choice issue relative to sharing with third parties.

This data provided greater household and emerging demographic, lifestyle and interest information whose use could sometimes double or even triple response rates from consumers who were receiving more targeted mailings than they would have otherwise received.

To better deal with the growing interest in targeting marketing by less sophisticated marketers, third-party data providers like Acxiom were also able to refine zip code level geographic clusters to household data clusters, eliminating much of the error factor seen in averaging a household with no children in with a

household with five children, creating a cluster of 2.5 kids on the average.

It is also important to point out one of the most valuable benefits of this kind of third-party data is the ability to take intelligence learned about customer behavior and apply it to prospects who identify themselves who you probably don't know much or anything about.

This happens when that third-party data is applied to a company's customer file and the predictive characteristics are identified. These characteristics can then be applied to the prospects who personally identify themselves and create a more effective interaction.

The use of third-party data has cut customer acquisition costs in half for many of our clients while again providing customers greater relevancy in offers than they would have otherwise received.

Since 2000, we have seen the widespread convergence of media, mailings being coordinated with television ads and telemarketing calls. Dial over an 800 number from a catalogue and you might get a coupon in the mail or via an e-mail offering you a special discount.

Today our clients, again, some of the largest,

most sophisticated marketers, use their own data along with third-party data where appropriate and useful to match up the right message with the right consumer.

This benefits the marketer with more efficient marketing and the consumer with less clutter. It is a real win-win for both parties.

I ask you are we following a similar path in the interactive space? And I submit that while it may not be an exactly parallel or linear path, we are tracking very closely.

However, there are some dynamics in the online space that have to be dealt with or we risk losing the trust of the consumers.

The medium allows for a greater opportunity for the consumer to remain anonymous. And we must -- I repeat "must" -- respect this.

The medium also offers risk, such as spyware and other clandestine activities that the consumer may be unaware of. They may be flooded with spam because it is inexpensive to send.

These issues have to be dealt with for the marketers in the online world to enjoy some of the benefits that off-line marketers have enjoyed for many years.

How do we keep the consumer trust? I believe

here too the same principles we preach off-line are appropriate. This means data should be appropriate for the use to which it is put.

If the data is being shared with other parties or used for other purposes, it must be disclosed. The consumer should have some easy to execute choices regarding the use of their data and that sharing. And the information should be appropriately safeguarded against loss and unauthorized use.

The FTC's championed these principles for many years. Also, trade associations like the DMA and the MAI have made them mandatory codes of conduct. And I submit we have learned a lot, but we have more to learn.

In the online space we have seen the evolution of sites posting privacy policies. However, these concepts often prove more difficult to implement than we might expect as the FTC and other federal regulators experience firsthand with GLBA notices.

I believe we are learning what is effective communication with consumers and I applaud the FTC and their fellow regulators for the research they have done on GLBA notices and also some of the research we have seen here in this particular forum.

The next decade will certainly see some more sophisticated and integrated marketing programs. It is

my belief that some companies will fail, not because of the technology but because they don't maintain the trust of the consumer.

The companies that will succeed will be those that use data responsibly, respect consumers who desire to remain anonymous, provide choices about their use of personal data and safeguard the data appropriately.

Thank you.

(Applause.)

MR. WIESER: I would like to start a brief discussion among the people who were just speaking but as well as the rest of the group here.

As I launch into a couple questions, please feel free -- to the rest of the panelists -- please feel free to jump in here.

Dave, did you have slides that you wanted to put up?

MR. MORGAN: No. That's all right.

MR. WIESER: We will pass on that, then.

The thing that occurs to me as I listen to the discussion here is that obviously there is a lot of potential in narrowly targeting individuals based on data that's available.

In the advertising agency world, we have a divide between creative and media. What we see is that

even though often it's possible to target people via media, we don't see it happening as often as maybe it should.

For example, in New York, we get commercials for Alltel, which, last I checked, doesn't exist in New York. We get commercials for Sonic, which is a California-based chain of fast food which, again, doesn't exist outside the West Coast, I believe.

Now, is the targeting of the future going to impact the creative? In other words, knowing that consumers of Sonic have a certain profile and that it influences the creative, or is it going to influence more on the media, which is to say, the where, the when, the why, the how, the context in which consumers are taking in the media?

What are your thoughts on this?

MR. MORGAN: I think we are going to see both.

I think if you ask consumers today and research shows that the biggest complaint they have with online advertising and most advertising generally is there is too much of it, it is too cluttered and it is not relevant.

The two places you can address it that you mentioned, which is that you can be more appropriate in your choice of the particular kind of advertising

message for the moment in time or the kind of medium where the consumer receives it, and you can do a much better job targeting the kind of message that is much more relevant to that consumer.

Someone who is interested in video games is very interested in a flat panel television just as someone who may be a luxury spender, but they have very different ways of responding to that, and they should get different kinds of advertising.

MR. WIESER: Do we see that advertisers -- the issue we see here in the example I mentioned with the fast food chain or a mobile provider, the transactional costs of using specific media narrowly targeted can become so high that you don't end up being as precise as you might otherwise want to be.

MR. MORGAN: Certainly the Internet is changing the cost structure of that. So what was impossible to do with television broadcasts or cable footprints changes on the Web.

MR. VALADES: Advertising and the Internet is giving you data that you can really advertise a specific zip code and so many miles around that. If you are in New York, we don't have to spend money setting up something that you will not be able to purchase.

Also, the interaction with the user and, as Dave

said, the measurement, you can measure faster and more accurate than with the other means of advertisement.

So things are changing. The amount of information you can get from the user and their intentions, you can measure that.

MR. WIESER: To the extent that consumers would probably -- cookie deletion is a pretty common occurrence. It is not necessarily possible to know where somebody is located. If I go to a Yahoo home page right now, if I have signed out, no one will will know where I live.

MR. MORGAN: I don't believe anyone will believe we will see a world of perfect advertising. And we won't. Jeff made a very important point.

There are a lot of people who will always remain anonymous and want to be anonymous. They are going to be willing to accept less relevant or less targeted advertising, and that will need to be protected.

It won't be perfect, but it will be better. That's what we have to understand. This is going to be a long process, over the last 30 or 40 years in the development of direct marketing, and it is going to be a long time. We have decades before we refine the use of digital targeted advertising.

MR. WIESER: That's a fair point.

What do you all think about marketers' capacity to actually analyze information?

This is another issue that we see as being potentially an issue. It wonderful -- in the cable industry, for example, it is now possible to get quick stream data, theoretically. Of course, cable operators won't provide any below a particular zip code level.

It is possible to get billions and billions of pieces of information. The real issue is are advertisers and marketers able to make use of all this data.

MS. BARRETT: We are seeing a real increase in the use of statistical analysis by our clients. It is many fold over the last years.

They realize they really do need to do some heavyduty analysis to figure out what is predicted, and they are getting more and more data, and they may not know what value it has.

Some of it has a lot of value and some of it has no value. But you have varying degrees of sophistication for marketers. And I think newer, smaller companies struggle with this in ways that maybe larger, more sophisticated companies with more in-depth experience in targeting and understanding the use of data in general have.

MR. GRECO: Let me set a little bit of context in terms of the answer, if I could.

First of all, I want to thank the FTC for conducting these hearings. I truly believe as with the case 10 years ago, we look ahead to the next decade, and with all innovation comes uncertainty. I think you are hitting on some of that uncertainty.

The fact is that all marketing is moving directly. When we talk about the direct marketing process, it is a process, it is a discipline.

I'm fortunate to lead an organization that I chose to join a few years ago because of the professionalism and the talent and the discipline, some of the greatest brands in the world.

If you have that backup and say here are some of the best brands in the world in marketing, Amazon, multichannel in every facet and growing and supported by tremendous supplier organizations, the Acxioms, TACODA, the capability, as we continue to move forward, as we evolve, I believe that that balance between choice and control will continue to cause a combination of both creative and media selections.

In order to do that, we talk about really being in this sort of long term. The members that I represent are clearly in this to establish long-term relationships

with consumers.

We talk about establishing a bridge of trust. There are three words that we keep coming back to.

We talk about the power of direct, and this power of direct will continue on over this next decade. It is relevance, responsibility and results. And that the interplay among those I think gets right to your point.

In order to be relevant, increasingly relevant, in order to give consumers the choices they want, in order to communicate to them not only in the media as well as the creative area, the analytic capability will continue to increase.

So while it may not all be there today, there is a tremendous motivation if the marketers are going to fulfill their strategy which is to establish a long-term, positive, trusting relationship with individuals, they have to continue to invest in the analytic capability.

MR. WIESER: Marcia, how real are the concerns that consumers have in terms of not necessarily always trusting the people that are trying to market to them?

MS. HOFMANN: I think it is very important to point out at the outset here that studies have shown again and again the majority of Americans are very

concerned about their privacy and they don't want to lose it and want to maintain control over it.

That sort of backdrop is really critical to this discussion, because everything we have heard today has been about how advertising is becoming more sophisticated and more targeted as the technology becomes more sophisticated. With that sophistication comes greater capability to collect data about consumers and to learn as much about them as a marketer could possibly learn.

Mr. Morgan from TACODA noted that his company collects only anonymized data, but it is important to realize that can be combined with personally identifiable data to create a very detailed portrait of a consumer.

In my opinion, all of the market incentives go to collecting that data and analyzing it to the greatest capability. Marketers are going to benefit the most from knowing the most about their consumers, and they are going to be able to target advertising to the consumers to the greatest extent this way.

I think this shows there are few market incentives to actually protect consumer privacy. So consumers need to be empowered to make their own choices in terms of how marketing comes to them.

MR. WIESER: To that point, a minor disagreement, of course, coming where I'm coming from, we represent some of the world's largest advertisers, and I guess all of us who work with advertisers may have a different point of view on this.

My observation is that there is significant concern on the part of advertisers of going over some undefined, admittedly, line and creating a negative backlash. There is definitely concern.

We could argue about whether or not -- where that line exists. Maybe there's a better way to look at it.

What would you advise to marketers who on the one hand want to get as much information as they can about consumers, they want to be as relevant as they can be, they want to avoid wasting their ad dollars and, most importantly, they don't want to be seen to be too frugal.

What would you recommend as sort of a best practice for a marketer who just doesn't want to abuse a potential customer?

MS. HOFMANN: That's a really critical question. Surveys also show that people who receive marketing would like to see ads that are relevant to their interest. They prefer that to just random advertising

that may or may not appeal to them at all.

I think the way to serve consumer's interests and also the industries' interests best is let the consumers take the reins in this situation and let them choose the sorts of advertising they would like to see, rather than make decisions for them and then create an opportunity to opt out they they may not be terribly aware of.

I think consumers actually are very interested in receiving advertising that they like, that they are interested in, to the extent that they want it, and I think that consumers and, again, the industry would best spend its dollars and consumers would be best served if consumers were really able to make this decision for themselves.

MR. WIESER: Some of those models a lot of us have seen actually involve models where the consumer chooses what advertising appears on their blog page, for example; alternately, where consumers help create the advertisements.

So there are definitely some models of engagement like that. I think there is some recognition of that, absolutely.

MR. GRECO: Can I comment on that and ask for a reaction from the other panelists as well?

There is a very valid point here in terms of the situational dimension of it in that consumers need to have choice and the ability to engage that.

It is the issue of how does it get executed. As I thought about the title of this whole conference in terms of protecting the consumer, we have to parse the problem and talk about protecting from what.

Depending on where we land with this and which segment we are in, I think there are some things that everyone in this room, everybody in the world would agree that we want to protect consumers from, identity theft, from fraud, from those who would prey on our children.

We are all consumers as well as business people. We all have children or relatives we are attempting to protect as well. We see both sides of this.

When you flip that over and get past the areas we all agreed to, the debate needs to center and the healthy discussion has to continue as this innovation continues over in which situation, which form of choice makes the most sense.

There is no question that in some cases the consumer if not presented with an initial advertising may not even be aware that that opportunity existed for them if they have a life event change and it is about a

particular insurance product they never would have known about.

That's why in those kinds of situations we would very much want to see that opt-out. If it is mobile marketing, certainly if a cost is incurred on the part of the consumer, we wouldn't want to see that as the model.

I guess the question in all of this is do you see a world that is highly segmented as opposed to a one size fits all?

We are talking about individual marketing directly going to more smaller segments, going to people in different situations, giving them control. It is kind of dichotomy between one solution that would handle all of that.

MR. MORGAN: I think as far as someone who practices trying to better tailor advertising for consumers, I came out of the newspaper industry, and most people don't realize when you survey people why they buy a Sunday newspaper, five of the top eight reasons are for advertising, not editorial, car ads, home ads, slick coupons, department store promotions.

Those are things they weren't aware of beforehand, but they purchased the newspaper knowing they will find them. That has been zoned and sorted

according to what is most relevant in their communities.

I think one of the really market leading and forward thinking parts of the NAI principles was the sliding scale in terms of the use of anonymous data and personally recognizable information and recognizing you would need different kinds of notices.

Marcia makes a great point. One of the real dangers is what is happening sometimes when there is a misuse of personally identifiable information and people try to match it with other information, the bad actors.

We have to realize to create a more relevant media future, it is not just about better editorial. It is about actually giving people advertising with more information so they can make better choices for themselves and their families.

MR. WIESER: In the interest of time -- and we can come back to some of these topics at the end of this segment -- but I think we should move on to talking about mobile.

Brian Stoller is here from Third Stream Media.

MR. STOLLER: We are on the next slide. The third screen is the mobile phone.

If the TV is your first personal screen and the computer is your second personal screen, the third screen is your mobile phone. Actually, I only have the

one slide.

We are an advertising enabler. We sit between the media buyers and the content publishers to enable advertising on mobile phones.

Our clients include carriers as well, and as you see from value change, that's the third screen where we sit right there in the middle.

MR. WIESER: I wanted to segue from our prior discussion. The reason was an interaction we previously had.

I remember walking around at CTIA, the wireless trade show, and there was a frantic last-minute call with a client of ours and a carrier around an issue of privacy agreements. And basically an advertising agreement was almost held up because two entities had, both the carrier and -- the third screen as well as our client all had these very stringent privacy requirements, and they were getting the lawyers involved with making sure that nobody -- each of these terms were compatible with each of the others.

It was just -- the detail into which this went was just remarkable.

It really reassured me as a consumer as well. You can agree or disagree with whether or not those lines are being crossed. But it was very clear that the

privacy is taken very, very seriously.

MR. STOLLER: The carriers play an important role in this. They own that last well and monitor their networks extremely carefully. They have been known to swoop in within minutes and shut down gateways that have allowed spam or spem, which is a mobile term for unwanted messages on your phone.

They have been able to come in and turn off those advertisers right away.

MR. WIESER: Let's talk about the state of the mobile marketplace. First of all, as some background, there is 200, 300 million.

MR. STOLLER: 70 percent mobile phone penetration. So a little over 200 million mobile phones out there.

When you look at the 70 percent penetration, that is 95 percent of the adult volumes in the United States. That 30 percent is mostly children and seniors.

MR. WIESER: Seniors are actually being -- there are different mobile operators catering to seniors as well as kids.

MR. STOLLER: Yes. There are MBNOs. They license bandwidth from the largest carriers, the Cingular, Verizon. They are providing special content for those segmented audiences.

MR. WIESER: Specifically I'm thinking about Jitterbug which targets seniors and Disney Mobile.

ESPN Mobile went under. Any thoughts about why that happened?

MR. STOLLER: They didn't allow advertising.

ESPN had a very high subscription fee. The carriers, especially these MBNOs, are charging these large fees. The subscription model which we saw in the Internet world will slowly fall away and is not working in the mobile world as well.

The advertising industry is going to benefit the mobile world by allowing these smaller subscription fees.

Let me give you some examples here. The average mobile phone user who logs on the Internet through their phone and they pay a $5 subscription fee for sports, $4 for traffic, $5 for weather, $12 for e-mail access, $3 for news.

At the end of the day, when you added it up, you are about $40 a month if you want all this content on your phone.

The trend is currently 20 million people who are actively surfing the Internet through their mobile phone. At $40 a month, you are talking about $480 a year for Internet on your phone. It is a whopping

amount.

If we allow advertising, those subscription fees will come down and the advertising world will subsidize that content.

MR. WIESER: Do you have a sense or point of view on to what degree advertising will be centered around content versus other applications?

MR. STOLLER: There is a school of thought that says people will stick with the phones. But whether it is mobile surfing, global search, CRM where I think some of the best applications for marketing are because of the relationship of management over price.

MR. WIESER: Where is it that you see the bulk of activity from marketers will actually show up in five years from now?

MR. STOLLER: The concept being sought is this time-sensitive concept, sports, traffic, weather.

This weekend I'm trying to buy a new television. I went into the local television sales place and I had this very distinct idea I wanted this specific model. The salespeople said you don't want this, you want this other one.

I flipped open my phone and was able to do some consumer research on those actuals models they were recommending, found out they had a part that is prone to

break off, and then I did a quick price check and found that a quarter mile down the road they had a better model at half the price.

We will see Consumer Reports and all these other services coming online for mobile very soon.

MR. WIESER: What do you see as being, again, a key success factor for advertisers to avoid being intrusive?

By background, I did some internal surveying of our planners who work inside of our agencies over the course of the summer.

Some of them are excited about the potential for mobile marketing. It is an intimate environment in which to reach a consumer, presuming they want to be reached.

There are others who feel no way, it looks like maybe it is too intrusive, it is not right for certain brands.

What do you think is the best way to think about how to make mobile marketing not feel intrusive?

MR. STOLLER: The mobile marketing Association as well as the IAB are establishing standards for the types of advertising that's allowed on mobile phones.

There will not be pop-ups, not be location-based elements where you are walking down the street and

suddenly a message appears on your phone unless you asked for that.

Adhering to those guidelines and standards, which the third screen has been instrumental in helping to develop, is the way forward.

MR. WIESER: A question for everyone here before I move on to the next segment.

We are all probably familiar with Minority Report and Tom Cruise's character being identified by the marketer as he walks by it.

Good thing or bad thing that it is possible for a remote location to know who you are, what your interests are?

MS. HOFMANN: I would say from the consumer perspective, if that sort of advertising is something that everybody receives, that is certainly a bad thing.

In a survey conducted by the First Amendment Center a few years ago, more than 70 percent of respondents said they thought it would be acceptable for advertisers to have a harder time conveying their messages to consumers in favor of stronger privacy laws.

I think it is pretty clear that the majority of consumers, the vast majority of consumers would really have a problem with the sort of marketing that really sort of invades into your personal space.

Even though you are walking down the street, basically you have advertisements that really kind of intrude into your intimate bubble.

MR. WIESER: Let's presume that you have actually turned on a device to say that you are willing to accept, first of all. You think it probably still crosses the line?

MS. HOFMANN: Yes, in my opinion, it crosses the line unless the consumer has actually said I don't have a problem with that, and I mean affirmatively.

MR. GRECO: I was thinking about if that is a service that a consumer wants to engage in, that one way or another they have expressed a desire to participate in it, how we execute that is something that has to be dealt with so everybody is comfortable with it.

The fact that it allows that consumer to have access to more information than they ever had before, something that may be relevant to them, an offer that may be relevant to them, as with any capability or technology, when it is initially introduced, it is more challenging, and then we learn how to adapt to it.

I think back to EZ Pass. When it was first introduced, all of the horrific concerns that existed about how the data on EZ Pass might be used, and a lot of people that got past that. The folks managing it

acted in a responsible way.

The result is lots more people are now at the EZ Pass line and enjoying that convenience.

The issue does come down to is the service valuable enough that the consumer chooses to participate and whether that's an opt out after one interaction and don't bother anymore or an opt in, I think those are the debates we have to have.

The key has to be the service has to provide value.

MR. MORGAN: That's one of the dynamics that is going on, where we want to look forward 10 years and is the consumer are going to be in control of this? How much control they choose to take we will see.

But if it is not successful, it will fail as a business. If consumers don't trust it, don't accept it, if there is not relevancy, transparency and choice, it is going to fail the marketplace.

So I worry sometimes a little bit less about things and worry about a one-size-fit-all solution because they are going to fail. Consumers will go right around it, the ads won't sell, will make them upset with the brand.

As you know in the agency world, brands are terrified today about how they are marketed. They are

much more worried about the reception than when something goes wrong.

MR. WIESER: I should add, to clarify there is a bad -- the good example, I don't know if any of you saw in New York the Lenny Kravitz Bluetooth outdoor advertising display.

The concept is that you could walk by, say, a mobile outlet and you have certain music on your iPod, and maybe it is linked somehow through Grace Notes, and then a sample track that is somehow consistent with the music on your MP3 player is provided to you as a promotional effort.

MS. BARRETT: To John's point of one size does not fit all, not even three or four sizes fits all.

I'm not comfortable with the local bookstore going in and having that in my face advertising hit me because I feel like -- I trust that entity, I buy there regularly. They know me. It may be a local grocery store that I feel that way about, a small meat market or something.

However, I may not be comfortable walking into a department store that I have never visited before. There is a whole range of comfort levels that have to be factored into these choices.

MR. VALADES: There has to be relevancy and

control.

Let's say at some point last night if I could have the control to activate my phone and say what restaurants you recommend, what activities you recommend, I'm not very familiar with Washington, D.C., is there an event that I could go, you know my interests, something that you are going to miss out and it is four blocks away. And at the moment I will turn that feature on, get that access to that information, and that's it.

I'm out of Washington, turn that feature off, and that's it.

That will be very useful for the consumer, and it has the relevancy and the control.

MR. WIESER: The consumer has to decide to be receptive to it.

MR. STOLLER: There's an interesting other element in this. The current marketplace with the carriers having a 95 percent -- penetration of phones being 95 percent, the carriers aren't making money by selling more phones, they are making money by selling more services.

They do know where we are. The carriers do know absolutely where we are. If I start getting messages on my phone that are prompting me for ads or to go into the

store and if I get too many of them, I will switch my carrier service.

They are very concerned about churn rate now. They are the best industry watchdogs we have in the sense they have to monitor their own customers.

MR. WIESER: Is that necessarily the case now in an environment where there are really only four carriers, five in some markets? Do the MPNOs serve the market and do alternatives exist?

MR. STOLLER: I don't really know yet. It is the elephant in the room. We are all sort of touching our elephant in the middle of the room.

It is the fastest growing medium out there. I don't know where the MVNOs will be playing in this, the content publishers themselves and blend into the carrier on a whole. It is very difficult to tell.

We are still at very infant stages in the mobile market.

MS. HOFMANN: I also think your argument depends on the idea that one carrier is going to have significantly different marketing practices than the others. If it doesn't, if they are all pretty much the same across the board, I don't think a customer can really just switch to another carrier and get around that marketing.

They basically have to not participate in this sort of service at all.

MR. STOLLER: True. I think if we do see an influx of a number of carriers allowing advertising, there will be the one that stands up and says we will have a better policy against advertising, and customers will end up flocking.

A free market economy will end up being our best watchdog.

MR. WIESER: With that, we will move on to our next segment, which is actually a presentation that I'm going to lead here.

You did have one more slide.

MR. STOLLER: I did have one more slide.

MR. WIESER: Let's talk about the interactive future. To say that the future is going to be more interactive presupposes one more thing, which is that consumers will want to interact with their media.

We are making the argument that although many consumers want to interact, a lot of them don't. This may change over time. But we will go through some of these points.

I think this has some important applications as we think about a lot of the whiz-bang technologies that have been developed over the years.

To the extent that, as Bill Gates has said, paraphrasing, the rate of change at the present often far exceeds the reality of today, and what happens five or 10 years from now is usually very much understated.

That being said, I already told you about us. So what about the consumer? So there are a lot of data points out there that suggest that the consumer is taking control.

If you read the trade magazines in the advertising industry, the general press, The Wall Street Journal, Business Week, you believe consumers are taking over their media consumption.

There is all this wonderful technology out there to reinforce this point. Here we highlight multichannel video, video on demand, broadband, et cetera, et cetera.

But we are arguing that real consumer control on a widespread basis is actually constrained for a number of reasons.

Let's be clear here. The consumers want control. That's a great thing. They should take it. Every marketer wants to offer their consumers what they want. But we have to just be very conscious what the reality is.

We try to think now five years, 10 years from now.

Some of these issues which we see is really limiting consumers' abilities to take control of their media consumption, on the one part, business model issues, real limits to market appeal for control center technologies, difficulty changing consumer behavior and something we are calling negative utility in the economic sense of expanding choice.

Those are really subsets of this limit to market appeal. So the business model issues that we see, they are real barriers to entry in many media marketplaces.

Broadcasting, for example. It would be hard for some entrepreneur to think I'm going to create the Pet Channel to appeal to consumers that want -- someone is going to create an interactive pet channel on broadcast TV if consumers wanted it or their pets wanted it.

We all know there is limited broadcast spectrum. So you can't just license it to anyone at this point in time.

Similarly, the distribution via cable operators and satellite operators which is capital intensive, it is hard to get into the business.

You can't necessarily be completely responsive to every consumer demand, unfortunately.

Secondly, there's an indirect relationship between content producers, the creators and consumers.

That is to say that a creative person may have a great idea for a new piece of content, but they typically don't sell directly to consumers unless you are making DVDs and selling them direct over the Internet. Very little content is sold that way.

Next, the Internet bypass, this example as I mentioned, it offers potential to distribute content directly to consumers. But we observed that most consumers are pretty happy and pretty content with the way that they consume media today.

On this topic of limits to market appeal, early adopters are typically the people who consume that. And they are not necessarily representative of a broader public audience. But we tend to assume that, well, the behaviors of people who have this technology today will be representative in the future. That is typically not the case.

ESPN actually did a study on DVR usage patterns among a well-stratified study group. What they found is that most people in their study did not actually want to keep the DVRs when they found out they would have to pay for it, would have to make room for another box, other factors.

This was very different than the behaviors of people who went out bought TiVos or the early adopters

of HDTV, just as one example.

One of the drivers which we suspect causes some of these differences is income. As an example, we see here three charts dividing the population by the lowest third of income per household, the middle third and upper third.

We see Internet penetration is about 30 percent in the lowest third of households to about 90 percent in the top third.

Clearly that limits how much control the population as a whole may take. Again, if you look at the lowest third by income of the country, they don't really have access to a lot of the same technologies.

Age is another driver. I'm not sure you can see all of this. The slides will be available afterwards.

We have highlighted a number of different Internet applications. We see real differences between how some Internet applications such as instant messages are between different age groups.

We have to try to stratify behaviors by income, by age. That's probably the key drivers. But either way, it is clear that control is not something that everyone wants at this point in time.

DVRs are, again, an excellent example. This surprises a lot of people that in households with DVRs

today, only 10 percent of TV viewing actually occurs through the DVR.

The conventional wisdom says people with DVRs are only watching the DVRs, they are excluding every commercial, they are taking complete control. The reality contradicts that.

Data from Nielsen says that's 10 percent of viewing. It is late night TV, sports, news. People don't record this stuff on the DVR but they still watch it.

These numbers are much higher if you only look at prime time. It is closer to 16 or 17 percent of prime time viewing occurs on a DVR. But the point is that's 83 percent of viewing that's occurring live.

So why don't people want more control? We are arguing that DVRs themselves only have limited market appeal.

Again, conventional wisdom says everyone will have a DVR at some point. So far we are observing data points that are identical to the history of the VCR 25 years ago. We have data about the interface, but we don't see materially different data on the usage or update rates.

More importantly, because DVRs are going to be fee-based services, in other words, consumers will be

paying $50 per month for their DVR service, we don't expect that that many people will necessarily have them.

We look at the case study of any other premium cable service or satellite service, 30 percent penetration is usually where it caps out.

The consequence of this actually is that conventional television viewing will only continue to increase when we count for population growth and per household TV viewing which only increases with all this wonderful control consumers have with their I-Pods, their Internet, broadband, their mobile phone.

Conventional television only continues to increase 1 percent per year over any time frame, five years, 10 years, 20 years, 50 years. Population growth is also increasing.

These factors will more than offset the impact of DVRs. So again, continued increases in television viewing, which is primarily passive.

A question is really important to ask, which I keep asking in order to explore it, is do consumer want control? Because if they want it, marketers would love to let them have it and support it where they want it. There is so much interest behind this.

Two books really explore this topic quite well. One is not so well known. Pip Coburn, who was formerly

an analyst at UBS, has written a book called "The Change Function." He argues that change in behaviors will only happen when a perceived crisis outweighs the total perceived pain of adoption.

That is to say, if you are given a remote control that has 200 buttons and you look at it and think it will take you an hour to learn how to use the thing, there's real perceived pain of adoption of that remote control.

But if you are already pretty content to sit back with your 10-button remote control flipping channels, why would you want to change it?

Barry Schwartz' "The Paradox of Choice" is much better known. He goes about exploring why often less is more. He gives an account of you go to a restaurant, you are given five choices, each of which are wonderful. You actually will value the choice that you had based on the lost opportunity cost of the choices you didn't take.

This is a utility of choice, that we tend to value things based on opportunity cost that's lost. That's human nature.

There are good reasons that he goes into great depth exploring. If you went to a restaurant and had five choices, four looked terrible, one looks mediocre,

you might be happy with that choice because of the lack of opportunity cost.

This has real implications when you think about an interactive television world, where theoretically you have 500 channels but think of the navigation units, first of all. Think about how people are overwhelmed with choice.

If you can't tell -- if you are relatively indifferent between one piece of content over another, you really start to place -- you get less utility out of consuming more choice.

So these two books really start to explore a couple of these key topics that has a lot to say about interactivity and real choice and control into the future.

We are not saying this is not the direction we are moving in. Over the short period of time, these changes don't necessarily happen so quickly.

This chart may be a bit hard to read. Again, as a practical example, ABC recently made Desperate Housewives and several other shows available online for streaming video. You could go to their site and watch these programs any time you wanted.

We were able to get data from their public places and we compared this against actual data from

conventional television viewing. We made, as best as we could guess, an apples-to-apples comparison.

We can argue about the numbers that ABC provided. We used the most aggressive as in the highest interpretation, the most aggressive interpretation of the data that ABC provided compared to the Nielsen numbers, and we still found conventional television viewing outpaced by more than 40 times.

This is for some of the top-quality, A grade content out there. And 40 times is the popularity factor, as we have describing it.

Now, if we go to the iPod downloads, we did the same analysis, where we took the number of downloads that were made, recognizing some people watch the individual programs multiple times, some people download and never watch. We tried to make this apple-to-apple comparison, pardon the pun.

The popularity of conventional television to iPod downloads was over 8000 times. Part of this has to do certainly with the fact that you had to pay for the content that you downloaded via Apple. It was not free, it was not as supported.

The point is pretty clear I think that although there is some interest among some part of the population over true control, over when and where you watch

content, it doesn't trump the existing prevailing business models.

As we look forward, broadband penetration is only growing. We see it reaching saturation of Internet households really within the next few years. We think dial-up will virtually cease to exist over the next couple years.

Among these broadband households when we try to forecast the amount of content being consumed online, today there is 500 times more content consumed in the United States on terrestrial television than over the Internet for Internet video. 500 times.

This is not something that's widely understood, certainly in our industry, on Wall Street or anywhere. No one has really run the numbers.

We have at least taken an attempt at running the numbers. We see the total of streams online will probably triple. There are real capacity limits on the Internet as to how many streams actually can be delivered.

But if we take those estimates and then we look at this population growth and this household viewing growth, and we actually see that conventional television will probably still remain at least 100, possibly 200 times more popular than online video.

The question has to be asked how much control do consumers want and how much will they take. With that, maybe we will leave it to questions, either on this panel or in the audience.

MR. GRECO: I would jump in and say the key words you included in there which really will make a difference, I don't have an answer, is the business models, because the business models dramatically affect that adoption in terms of the cost structure that's involved.

The ease of use absolutely fundamentally affects it. And the other is as you look at that in various age cohorts, I would imagine that there will be an amazing difference between something that is literally programmed into someone's life from the day they are born as opposed to something they need to convert to.

We see that with technology all the time. I'm not sure you are seeing anything much different than the normal adoption issue that sometimes you have to go through a generation in order to see that change really take place. And the ease of use has to be a dominant factor here.

MR. WIESER: These changes do not happen over a five-year period. They are extended.

MR. MORGAN: It is important to note just

because some things are available or there is a perceived choice that is available, it is not really available. You talked about navigating 500 channels.

Who would have thought even three years ago that it would be possible to navigate 10,000 songs in your pocket? I would argue it wasn't just the lower cost and the seamless integration. It was the fact that they changed an interface that actually made it a lot easier to navigate.

Some things change slowly, and then they change suddenly. I think that one of the things we can't ignore that is people love to have choices and they probably love as much to have choices as sometimes not to make the choice, like the opportunity to abstain.

I think John Stewart Mills said that a man's own mode is the best mode, whether it is the best in and of itself, but because it is the man's own mode.

The ability to abstain, to know you can do something else but don't have to I think is very powerful. I think some of the statistics don't capture that.

MS. BARRETT: Let me also comment that I think consumers want choice, but they want choices they can understand. I think it speaks to industries' responsibility to develop good practices and the

consumer's ability to speak out.

When someone has stepped across the line and said you have gone too far, to say I want some things under control that I don't have to take control of, and then on top of that I want some choices beyond that, as we were talking about, give me the freedom to say yes or no to this situation or abstain, if I choose to abstain, from making the decision at any point in time.

We can overwhelm the consumers with too many choices or too complex choices and that typically creates paralysis.

MR. WIESER: Any questions in the audience?

Did we explain the whole marketing and advertising world of the future?

With that, I think I would like to thank you all very much for attending. I thank the FTC very much for holding this hearing.

Again, to everyone who attended on the panel, thank you so much for your participation. And we look forward to any questions and comments you may have after.

(Applause.)

(Luncheon recess.)

AFTERNOON SESSION

MR. BREGMAN: My name is Mark Bregman. I'm the CTO of Symantec. I'm the moderator for this session.

This is a session describing how we use the marketplace and, in particular, increased computer power on commerce.

Let me introduce our speakers. I will introduce them quickly. You have all the biographies in the packages.

To my left is Dr. Eric Horvitz, research area manager of Microsoft Research. To his left Dr. Anthony LaMarca, associate director of the inIntel Research Lab in Seattle.

To my immediate right, Sal Capizzi, who is a senior analyst with the Yankee Group. To his right, David Hitz, who is the founder and executive vice president of Network Appliance.

On the phone not here in person we have Dr. B.J. Fogg, who is a senior researcher at the Stanford University's persuasive technology lab.

Finally, to my far right, Deirdre Mulligan, who is clinical professor of law and director of the Samuelson Law, Technology and Public Policy Clinic at USC's Berkeley Boalt Hall School of Law.

We will start off with Dr. Horvitz giving us a

short presentation on artificial intelligence to sort of set the stage.

DR. HORVITZ: Maybe we will stay seated here, a bit more informal. I think I can grab the advancer.

AI is the scientific study of mechanisms underlying thought and intelligent behavior and their embodiment in machines. People typically think about AI as being the pursuit of automation of tasks that typically require human intelligence and beyond, sensing and learning, optimization and search, application versus theory and so on.

The field evolved starting around 1956 and today is associated with a rich set of subdisciplines, spawning whole conferences on machine learning and data mining, logical reasoning, decisionmaking diagnosis and so on, as well as communities that have evolved looking at application areas.

I'm trying to advance the slide here a little bit. There we go.

I need help from behind there. They include natural language, vision, speech recognition as well as domain-specific areas such as AI in medicine, AI in law, game playing, competition and neuroscience.

In some ways AI might be said to be at the forefront of what might be viewed 25 years from now as a

computation revolution akin to the industrial revolution in terms of the influence it's going to have on society, commerce, socioeconomics and so on.

What we are seeing today is almost an inflexion point of increased prowess and learning and reasoning, computation.

We are all experiencing the crash in memory prices and the exorbitant amount of memory available these days, connectivity and content.

I think looking forward we can expect AI to have influence in many areas in daily life, including communications, time management, health and safety, education, goals and needs, games, even things like systems that help to augment your cognition.

In the scientific world, we will be seeing AI applied in science in a variety of ways, automated discovery, the interpretation of data, particularly biology and chemistry and medicine, and even the climate will probably see some very interesting innovations coming from the AI analytics on data.

Some of the key insights and technical breakthroughs will be enabled by AI methods. A decade from now people will look back and say there were a couple of big breakthroughs in science that came from the automated reasoning systems.

Turning to the consumer, there is an evolving relationship generally with computation I would like to touch on for the next couple minutes.

Particularly in the realm of sensing, reasoning and learning, we will hear about that from my colleague in a few minutes, personalized smart applications coming to the fore, more products and services.

For the focus of this Tech-ade meeting, there has been an interesting set of challenges and opportunities with data and privacy, data that enables these smart applications, creating a tension and a balance with the need for privacy.

I thought I would mention a couple of points in space that we might see innovation in the future. In particular, I will call these sort of the points of possibility in regards to this evolving relationship with computation.

We can expect there will be systems that will triage alerts and messages for users in the future.

Some of these are already available today as well as systems that can show us rich visualizations of complex reasoning, ability to understand patterns, visualizations, systems that can proactively provide us with information about things like traffic jams and how long traffic will last so we won't be surprised by

traffic, for example, as well as systems that can actually keep track of what we are doing, that help us remember, help us search and find data.

There will be various ways of using computers that will be quite different than the way we use them today.

For example, handsfree and personal displays, interactive systems, for example, helping a paramedic assist patients as he draws upon the best expertise, devices you can wave at products in the store and determine more information about them, for example, call-backs and problems with products, ingredients and so on.

We can expect speech and other kinds of natural interaction methods like handwriting and even sketch recognition to be commonplace some day.

In more subtle areas, we can expect our computers to understand our attention status, understand when we are busy, when we are taking a cognitive break, for example, when we might be available for an alert or to look at an advertisement; systems that can predict when we will be in our office next, when will we next be available by phone, for example.

For example, they can send back out of office messages, how much time it will be until the message

will likely be read statistically.

These kinds of tools --

MR. HITZ: Never.

DR. HORVITZ: For some messages, yes, that's true.

One service that is being used at Microsoft Research is called BestComm, best means of communication, that figures out what is happening between a call and caller and picks the right timing and modality of communications.

These kinds of tools will become quite popular. We are also seeing a shift of high quality expertise and services to the consumer. For example, in this home-oriented health care system for pediatrics in this case, this system actually was using leading expertise of the best physicians in the world.

And in this case, Richard Behrman, I still refer to him in medical school as the Pope of pediatrics, he writes in Nelsons Pediatrics, he says you diagnose pediatric problems with a chief complaint of abdominal complain in a young child. Those kinds of things will be available online some day.

More collaboratively, the idea of the slide is we can actually have computers that can understand what part of the problem we can solve best and what part of

the problem the computer can solve best and provides agents that can work with us on scheduling tasks interactively, looking at a calendar realizing when to schedule from a free text message and putting the appropriate appointment on our calendars.

The trend is large quantities of data, new sensing and online processes, plus advances in machine learning or tractable statistical methods methods to do this.

This will be a very big deal for consumers. But there are lots of privacy challenges but also opportunities that come with this. I will say my one technical slide if you are interested in how this all works, often thousands of variables, these circles can represent unknowns about the links between demographics and the willingness to buy a particular product, for example, how age and gender might influence click-through in an advertisement, for example.

We have methods that will do very large-scale searches through large spaces of structure and figure out causality, identify hidden variables and connections between these, and in the end build predictive models that can be used to make predictions, given limited observations.

These are leading to what I will call a

proliferation of preference machines. One type of preference machine is called collaborative filtering.

We are all familiar with this kind of preference machine. The idea is you have a community of people buying, purchasing, clicking through different places, you have a big database of these people's behaviors, process that and make recommendations about products or content.

At my own home I checked out Amazon recently to see -- I don't order, but my wife sure does. From the recommendations, I got a quick sense of what was going on in my own household with my son and my wife.

What is going on here is these systems are actually doing clustering to figure out where, for example, my family fits in, my wife or son fit in with the rest of the world.

More generally, we are seeing a proliferation of what I call intention machines, systems that can compute what people are likely to do in the future.

Those kinds of machines can be leveraged in a variety of ways for commerce.

We all know about Web search, what Microsoft and Google have been doing and Yahoo and other Web search providers, watching click-through, give inquiries, redesigning the ranking engines continually as well as

the advertising engines to figure out what content to provide as well as ads to provide to maximize revenues.

We can go beyond search to consider various kinds of services, and this is an example of an intention machine that might be scary at first. We gave out 50 GPS devices every two weeks to volunteers from Microsoft to collect data on where people travel in the Seattle area and beyond.

We are getting pretty good coverage of travels throughout the greater Seattle area, closing in, showing you the fine gradients here. And with these systems, they predict with surprisingly good accuracy the minutes they are driving, where it is they are probably going and what region of town they are going to.

If we knew that, you can imagine the services, for example, like providing systems that provide traffic advice, guesses where you are going, or heading to the airport, for example, a system that understands, makes a deal with a company that provides parking, for example, that might be available. I'm on my way to the airport, or special deals for you as you travel.

You see these kinds of applications and say these might be great for commerce, the information that is being sent. But the idea is there is lots of opportunities here for protecting privacy.

I want to touch on one briefly here. I have limited time today. I will leave a couple ideas for future discussion.

We talk about protected sensing and personalization, what I will call PSP. We have a shroud of privacy that's extremely protected.

In fact, this shroud of privacy can be the metal around their hard drive in their home. We have sensor data coming in, watch actions, content and preferences and context. All that is done inside that shroud of privacy.

We do machine learning. We have a complete data mining center and build protective models there. We use those models, given sensor data and context to make private predictions, recommendations and service.

At times we might get a model built like we did for Seattle and actually have a third-party content come in, like a cache of advertisements. But that is done privately.

We even have prebuilt models. You can imagine how this works for traffic. Instead of getting the GPS data from others, we actually collect your own GPS data, build your own destination prediction models and use them in connection with third-party content like that traffic company, that parking company, as well as a

pretrained model.

This kind of work we are looking at carefully as getting the best of personalized reasoning at the cost of very little sharing of private data.

One more example before I start, personalized Web search, a great example doing a lot of work in this area, the idea is back to our shroud of privacy again.

If you want a personal desktop system, it knows all about you, all your mail over the years, your activities, your calendar. That's what we have in a desktop index. The idea is to say how -- ask how can we leverage that personal, very sensitive data providing better search for users.

I do a search, in this case Lumiere. I can search here, instead of bringing back 20 results, we bring back 200 results and process those results, match it against personal index, resort them, rerank them and provide personal rankings.

So now instead of getting -- having to go through many results to get down to the bottom for the Lumiere modeling project, it copies right at the top of my page.

That is all done under the cloak of secrecy and privacy. So I will stop there and move on.

(Applause.)

MR. BREGMAN: Let me start off a very brief discussion with a question.

Whileit is a rather compelling model to have this shroud of privacy, it seems to me there are going to be a lot of commercial pressure to open that up.

If I'm an advertiser, I will not want to pay to send a number of ads and not know who's seeing them. I will want to know someone saw my ad in order to pay for it.

Likewise, if I'm paying for placement in a search engine, I will want to know this information. Otherwise, I don't want to pay for it.

So do you see a natural tension? And if so, are there thoughts about how to address that as we almost inevitably see the collision between private or personal control over this private information and the commercial desire to access that private demographic kind of information?

DR. HORVITZ: This notion of protected personalization is only one of several pillars of opportunity for exploring, for turning AI inward.

I should say this personal personalization and sensing notion doesn't solve all the problems. An adversary could say I could put in ads of various kinds and watch to see click through and learn about users

that way.

One could imagine various ways to cloak that by helping akin to a Nielsen rating. We understand the statistics and we work and keep complete privacy.

But I think that is unreasonable in general, as you point out. There are lots of problems here in general, and other kinds of technologies will involve learning about people's preferences for sharing, looking at their behaviors and searching through possible inferences and figuring out what can be discovered from them from what they have done. So yes.

MR. BREGMAN: It's a challenge.

DR. HORVITZ: A big challenge. Rich sensing and AI applications don't necessarily mean sharing all this stuff with the cloud, this mysterious service somewhere at Microsoft or Amazon.

MR. BREGMAN: Ms. Mulligan, this does raise some issues you interpret as legal or policy issues.

What if anything is going on in that world, thinking about the enabling policies and how they are going to impact policies to protect privacy?

MS. MULLIGAN: I think in many ways the technology is typical, is in front of where privacy policy is.

If you think of everything from where the FTC is

the model of notice and consent, it is really difficult thinking about the kinds of data mining applications and different kinds of collaborative filtering, how do you inform consumers in a meaningful way how it is going to be used.

Some of the more complicated issues arise from we are very interested and have been historically in trying to get to the one consumer, understanding we are going to figure out how to narrow cast.

I think we have seen, particularly when that kind of narrow targeting results in things like variable pricing of the same object to different bands of consumers, that consumers get quite agitated about it, and you can imagine lots of the collaborative and data mining applications being used to narrow information casting, narrow product casting.

I think we will begin to understand where it is not just about privacy. We don't want people making product differential decisions based on that kind of information.

I think this is an area we will get into lots of consumer sensitivities that go beyond privacy.

MR. BREGMAN: It strikes me that one of the other challenges we brought these ideas of AI to sort of individual consumer information is the correlation of

that information which in fact is the thing that disturbs people.

Certainly in the United States, there are a lot of people who are not unhappy with getting a little bit of privacy to get a discount at the supermarket. But they probably don't want that correlated with their workout schedule at the gym and given to their insurance company.

A lot of the value you are showing in these AI solutions is correlation intrinsically. So it seems like there is an education process here for the public so this doesn't appear that this is a black box magic, that there is education.

DR. HORVITZ: If you look at Brandeis writings, when flash photography came to the fore, all this discussion about the privacy violations of having these cameras in public. There's still a concern at times with the paparazzi and so on.

For general use, this technology has become commonplace and accepted. On the other hand, one can imagine technologies like having a really rich semantic Web built around privacy where on any datum coming from me, here is meta data on intended use, and the Web knows it is restricted to use that data only in a specific way.

The idea is not letting things out in the wild and getting people used to these things but also coming up with controls that provide the kind of richness that commerce would need and people will expect.

MR. BREGMAN: And ensuring the control remains in the hand of the consumer.

MR. HITZ: The question we have not answered is for a lot of this data, who owns it? Do I own the data about me or does Amazon own it? If they own it, can they sell it? There are different categories of data.

But from a policy perspective, who owns that? These are unresolved in a lot of the space.

MS. MULLIGAN: From a policy perspective, that's not the right question.

MR. HITZ: I'm not a policy guy.

MS. MULLIGAN: We talk about data protection, rights and responsibilities. The data is clearly about me, regardless of who physically has control over it.

What we have done through privacy protection laws is you can have this data for a limited purpose, and as a holder of this data, you are a custodian, and you have obligations to limit its reuse and to make sure that I have certain rights even though I no longer have complete physical control over that information.

I think these kinds of markets are going to

demand a much greater attention to detail about how we exercise those rights and responsibilities. I do think that Dr. Horvitz presented a very interesting model with client-side control information.

It doesn't necessarily answer all those questions, but it does put the data in the physical control potentially of the individual about whom it concerns. I think that creates a different negotiating playing field.

I would suggest on the model suggesting every piece of data is going to be tagged with its privacy and preferences, I was here 10 years ago talking about the platform for privacy preferences.

The data, I would actually tag data on an item by item level and make it -- use all of the wonderful things we have from artificial intelligence to leverage consumer's capacity in the marketplace. And I would love to see that happen. But I still remain a little pessimistic.

DR. HORVITZ: I think it would be tough. As I tell my semantic Web buddies, it is the first great application as I have found, this idea of a Web aware or privacy-aware Web. That would be very nice in its initial application of these ideas.

MS. MULLIGAN: The absence of it will prevent

some of the interesting applications that you are talking about.

MR. BREGMAN: There is one other issue and it will actually lead into our next presenter's presentation, and that is that while we may understand some aspect of the rights to that information, there is also a potentially proprietary feeling about that data.

I will use the example of Amazon. The purchase pattern data may pertain to you or your familiar, but Amazon feels they have a proprietary right to use that data.

When we get into the world of distributed sensor networks and presumably those networks belong to someone other than me, there is an interesting question as to do I have the right to take data from this network and repurpose it in a way that wasn't necessarily intended.

MS. MULLIGAN: You are right, it is an important component, but it is not a novel component.

If I'm a physician, I have a deep proprietary liability interest in information that's in your record. Because if you sue me, I need to be able to show the standard of care, show what I did, produce it for insurance purposes.

That hasn't stopped us from creating a very rich privacy regime to make your interest in the record I had

as a matter of my practice is protected. We know how to actually accomplish both the proprietary and privacy. It is just that it can get complicated. But we do know how to do it.

MR. BREGMAN: It seems to get more complicated as it gets tangled up.

MS. MULLIGAN: The sensor network example was a good example.

MR. BREGMAN: Let's move on to Dr. LaMarca.

MR. LAMARCA: I want to start by complimenting the first speaker, for 15 minutes is an extremely daunting task. It is a good lead-in to what I'm going to talk about today, the challenges and opportunities for sensor networks.

For those unaware of the term, a sensor network is defined to be a computer network of many spatially distributed devices to monitor conditions.

There are a couple key words in here. The first is there is a computer involved and monitoring conditions, as in real actual physical things that are happening, the light, the temperature, the noise and environment.

While the term might be new, I'm sure you can think of lots of examples of this. Sensor networks have had wide and varied deployments for years, factory

automation works, when they assemble things.

Modern cars are said to have dozens, sometimes hundreds of sensors in them, seismology and large numbers of applications use sensor networks now.

The deployments are typically sensing elements at the periphery connected by wires to a much smaller number of centralized computing devices.

So you may be saying to yourself why are we hearing about this today with challenges for the next Tech-ade?

The reason why is there are some technology trends that have been working away on your laptops and PDAs and phones that are going to completely revolutionize the way sensor networks work. I will quickly tick through these trends.

The wireless networking will allow us to take the wires out of these sensor networks. Those great little flash key chain drives have a compact flash chip in them and can allow us to store the data where it is collected.

Small, efficient, inexpensive processors enable data analysis, much of what Dr. Horvitz was talking about right there, actually where the data is collected, some filtering.

There has been a renaissance in the actual

sensing elements. These are the things that actually measure pressure or light or temperature. They have become very, very small.

And adding this all together means that the components that actually compose sensor network applications in the future, especially in new domains, are going to look very different from the components in the past.

I have one here. This is about the size of a quarter, very, very small. That's kind of the point. This is a Berkeley Dot modem. A slightly larger modem has 11 sensors, four gigabytes of flash storage. We are using it for physical activities for health and wellness monitoring.

The affordances that these components have are usually driving new applications and new usage models. I would love the take 10 minutes for each of these applications. Unfortunately, I don't have time.

These devices are small and unobtrusive enough that they can be used to instrument everyday objects, pens and bottles of water and clipboards.

Instrumenting everyday objects can actually be used to aid care providers in assisted living facilities. The sensors are sufficiently sensitive that farmers are looking at instrumenting in the case of

high-volume crops, like grape plants for wine, information on individual plants, sensing at the meter level in terms of water and soil conditions.

In terms of emergency response, sensors have long be used for earthquake detection. But now emergencies that happen in a remote area like a forest fire, people are developing systems for flying over the fire with a box of these wireless sensors and shaking them out the back of the plane.

They can self-assemble into a network, presumably before they burn up, and actually measure the temperature gradient and actually transmit that data back to the firefighters.

So a huge wealth of high-value applications. These are not commercially available widely yet. This really still is the domain of the start-up and the research lab, and that's because there are a few key research areas, that there is still progress to be made in beyond the typical robustifying, shrinking the size and introducing the price.

I will touch on just a few of these. I won't say much about sense making and inference because that's what we heard about in the first fifteen minutes, but I will point out how it is going to be applied.

Today, the typical sensors at work, the ones in

your house, the security system in your house, they actually work by directly observing the phenomenon that you care about. You actually deploy a special magnetic switch on the door and measure the fact that it is opening and closing.

Less typical is when the phenomenon is actually inferred from the data. An example would be a hurricane.

What the weather people do is collect data from hundreds of sensors, water temperature, air speed and compile it all into a huge computer and actually produce as a prediction.

As applications move to more generic platforms with widely varying sets of sensors, that latter type of deployment will become more the norm.

The problem is in the case of the weather models, they were very specifically hand tuned. And we're really going to need to make it more generic so that you can actually deploy an application and provide a few examples saying the thing I care about is happening right now and have the system learn and train itself.

It is a big challenge in machine learning.

So privacy security are obviously a big issue in this space because we are measuring things about the

physical world that people are living in. There is obviously a privacy concern.

To some extent, we have kind of made the problem harder by having hundreds of computing elements and by removing the wires we have replaced them with radio transmissions which then introduce another link to security.

Despite the size, these are full blown computing systems. So existing encryption and authentication techniques can be applied. There are research efforts underway to produce versions of classic libraries that have been tuned for these impoverished platforms.

One thing I can't help but mention is that actually the sensors themselves can be used to try to improve the authentication.

A device that wants to verify the fact that another device claiming to be nearby is in fact nearby can use the data it has collected from the environment and correlate it with the data that the other node is claiming to see and prove to itself with some satisfaction that it is in fact nearby.

The last problem we talk about and really, to be totally honest, this is the elephant in the corner of the room, is power management.

For me, a future in which consumers dash around

changing batteries and sensors is definitely not a good vision. The state of the art is these sensor nodes are deployed, unless they have a permanent power source, generally deployed with new, modern batteries, and when possible they can be put outside to do some solar recharging.

The real gains have been in enabling these low-power sleep modes. This is why your cell phone lasts 10 days now when only lasted a day ten years ago.

That will really only take us part way. There are two technologies that are coming down the pike that will provide some relief here. The first is near term. In the next year or two we will start to see ultra-wideband radio, which is one of the first radio technologies that have been tuned for really, really low power and short-range wireless transmission.

That will definitely help the radio aspect of this. Finally -- this is still in the research lab -- the devices themselves are drawing on less and less power each year.

They have gotten to the point that the devices can potentially harvest enough power from their physical environment to actually power themselves in perpetuity. So the vibration of someone walking by the hall or trucks driving by or plucking energy out of the air in

form of radio transmission.

A colleague of mine will speak later today. He harvests power from RFID. This could help us definitely solve the power problem.

Summarizing, I want you all to remember this is not today or tomorrow, but five to 10 years from now there will be this big explosion in wireless sensor networks.

And they are going to be sufficiently flexible and powerful that they will open up a large number of application domains, but they will also bring with them challenges in the future. Thanks.

(Applause.)

MR. BREGMAN: The first presentation raised the issue of privacy around how artificial intelligence can be applied to a lot of personal data.

In the examples you gave, they were primarily sort of opted in. I choose to carry the GPS around or not to.

With the sensor networks deployed, it appears I don't have the option to opt out. I suppose I could choose not to enter that environment.

So that raises one very important, I think, different issue here. The second question is how can you assure there isn't -- and this is more of a

securities issue -- subvert the sensors. Maybe I walk around with a heat gun or do something to falsify the information being detected by these sensors. They need some mechanism to assure they are not being breached.

Are those areas of research you are focusing on?

MR. LAMARCA: I work in a quite small research lab. I would say to the first question, I'm sure we already live in that world. There are Web sites where you can say I would like to get from point A and point B and be on camera as little as possible.

MR. LAMARCA: The real issue here, and this is why people have the big issue with this, is it is human, I saw your acceleration trace, and let me tell you it is not quite the same thing.

MR. BREGMAN: Not yet.

MR. LAMARCA: Sometimes adding sensors and taking away something else makes people's sense of privacy better. For the elderly in assisted living facility, give me that and take the camera out of my room. That's a huge trade-off.

To be fair, the employees in the facility didn't like that idea, because unlike the cameras, the employees didn't know where you could safely go smoke. The incentives of different people are very hard to predict.

DR. HORVITZ: This is a really interesting challenge. I feel like turning it over to Deirdre.

What does it mean these days, the composition of multiple camera views into 3D views, just from the ambient stuff being taken by cameras that happen to be out there?

MS. MULLIGAN: I am part of a national science foundation center called the Center for Technical Research on Ubiquitous Secure Technology.

I have colleagues in engineering and computer science, and they are researching the motes that we have been talking about. We are looking at the privacy and security issues in a host of different areas.

One of the areas we have been looking at is the context of energy consumption in the home. There is a big push in California after our energy blackouts and brownouts that happened in California to figure out how we create a market for energy, which means consumers need to have realtime information about pricing, which means we need to develop an infrastructure.

Part of that infrastructure is going to be your appliances are going to have different kinds of sensors on them and your home will also, and these will sense the kinds of things Anthony was talking about, heat, humidity, light, occupancy.

We actually have three houses wired with these sensors, and just looking at this raw data I can tell you when one of the young couples got up during the night to take care of their kid, I can tell you when they were eating, when they did their laundry, and I can tell you after they went to sleep at night, they are still generating a lot of heat.

This is all data that is not personally identifiable in the way in which we typically consider it. It is about their home. It is about physical events.

It is about acceleration, things we wouldn't typically think of as particularly revealing. And yet, when you start to actually look at it and apply some of the artificial intelligence techniques to it, and you know a tiny bit about it, you can learn an awful lot about people from what physical events are happening in the environment in which they live.

I think you are right to point out concepts like notice and consent, what does it mean to opt out.

In California, they sent us Mylar bags to put our EZ Pass in order to opt out. So we are mentioning a whole line of Mylar clothing so I can opt out. These things don't map very well into this environment, and there is a lot of proactive thinking that has to happen.

Part of it is going to be about technology design, not just about policies. Policies can constrain use. But they don't actually influence the capacity of the technology to afford people different kinds of choices.

MR. BREGMAN: Let me try a slightly different angle. This comes up and many of us on the panel may have kids. It seems there is somewhat of a generational shift in the meaning of privacy.

All you have do is go on Face Book or MySpace and see things that people that are of policy-making age probably wouldn't approve of or wouldn't do.

Maybe we are actually solving the wrong problem.

MR. HITZ: I have an observation about privacy.

My dad grew up in a small town and I grew up in a much larger city. If he went to the store and tried to buy cigarettes, his mom was getting a phone call from the grocer. He told me the first time he took the car out and the neighbor got a trace of his acceleration profile and his dad got a phone call.

We have become more privacy sensitive in the past 50 years. At least people who came out of small towns had no expectation of some of the kinds of privacy. I wonder if that will switch back.

MS. MULLIGAN: I would say you were jokingly

referring to Face Book. We could also refer to Geraldo Rivera. That is people of policy-making age, I would suggest.

I would think privacy is a very contextual thing. You can't say look at people over here putting their home on some video camera on the Web, that means they don't care about privacy.

That same person might really care about Amazon tracking their book purchases. Yes, at times we appear slightly schizophrenic. I don't think that is today.

Historically people have made all sorts of decisions about what they bought in a brown paper bag and what they bought mail order and what they were willing to go in to the store but he had an option that allowed him to purchase --

MR. HITZ: They caught him anyway.

MS. MULLIGAN: Maybe. I think that schizophrenia is because privacy is so contextual.

MR. BREGMAN: You think it is tectonically shifting.

DR. HORVITZ: On my slide on the Web, you will see the last couple slides are about applying machine learning to data, maybe 60 different kinds of items, from your Social Security number to a large personal failure to a small transgression to your home phone

number, and then about 30 groups of people on the Internet randomly, your grandmother, your manager, people who report to you and so on.

Looking at discomfort, we find some similarities but a tremendous variance, including some of the more modern ones, defined by my colleague to the left here.

I think there will be a learning curve about what people are comfortable with and also a curve about developing tools that potentially allow people to set up different policies potentially at times, creating enough services for revelation of personal data.

MR. BREGMAN: It sounds like there is sort of an economy of privacy.

DR. HORVITZ: It could be or at least models of preferences and controls and ways that actually are usable. That's one of the big challenges.

When you look at the details of privacy, you worry about Aunt Polly looking at 35 dials of contrast brightness or Uncle Jack. The hope is there will be some universal controls that map well to variation in preferences that will allow the system to be usable.

MR. LAMARCA: I wasn't going to bring up design at all. But Deirdre brought it up.

There does appear to be fundamental tension between how to design a sensor well to do its job and

also to potentially provide privacy.

Ideally these things would be very small, deployed as flexibly as possible.

People live in these environments and they don't want large sensors so their neighbor can say you got the Sensor 2000, let's go talk in the back. Deploy these in your house and here are instructions for what it does. But why did you put that under the couch? It was ugly, I didn't want it out.

There are some fundamental tensions here to achieve real value for consumers, which is what we are talking about.

MS. MULLIGAN: The notion that privacy is going to emerge in the market is an interesting one.

I think in this particular area, the privacy issues are going to feel so complicated in many ways, I think the same way when we move to digital communications and e-mail and remote storage of information.

There was an understanding that creating some baseline protections was necessary to enable the market. And I actually think we have seen this with RFID already, where we have state laws proliferating because people are afraid about the information being broadcast.

It was in many ways because there wasn't kind of

a front-end effort to educate people about the technology, to create some best practices, whether those are self-regulatory or whether those are through regulatory or legislative interventions.

There is a lot of risk of technological fears of technology adoption if people aren't certain what the privacy framework is, building an environment where your house is sensing all your activities sounds a little big brother-ish.

So I think there is a need to think up front where those rules should be.

MR. BREGMAN: It seems there is also a tension that develops in terms of to whom the value accrues. Is it the consumer who is presumably not funding it or is it the corporation or big brother who is funding for some reason that infrastructure.

MS. MULLIGAN: A lot of the stuff Anthony was talking about, the smart home application, the energy, things for disaster recovery, there is no doubt all of these are incredibly important, the ability of people to live at home for longer and to have far less invasive stuff happen, don't have to have home health aides there every 20 seconds to make sure they are okay.

I think there are really deep benefits for the application. With some of the commercial applications

and the marketing applications people may feel that tension.

The question is what does the policy environment require to make sure people feel comfortable enough so they can take advantage of those benefits.

DR. HORVITZ: One comment. With this technology evolving the way it is, we often presume a progressive democracy with good intent on the part of government.

I think as technology providers and as policymakers, we have to think about the rest of the world or the way the world might go some day and just think through long term about what these technologies mean for humanity, given the fact that we don't always have dependable, trustable governments in place.

MS. MULLIGAN: How great is it, Anthony, that you are making that comment?

MR. BREGMAN: Very good point, though.

DR. HORVITZ: We assume Europe and U.S. are alike in the way of thinking about that.

MR. BREGMAN: Particularly as we start to talk about these things that become part of the environment, like the sensor networks or more so the things you were talking about which exist almost in the cloud, the challenge, of course, is not only there potentially for governments, but there is also quite a bit of social and

different feeling about privacy and how does that get regulated.

In the United States, there is a different feeling about personal information privacy than in Europe, and the geographic boundaries can vanish very quickly as you get to this networked infrastructure. That will drive some of the policy as well.

DR. HORVITZ: Just being a fly on the wall to Microsoft discussions about privacy and handling, making sure the systems and policies we have in place are satisfactory and will delight European policies while still enabling some of the technologies and ideas and commerce that may be more permissible under U.S. expectations, getting a sense for how that would work and thinking about long term how tools that provide flexibility, the thing I was mentioning earlier, the kind of controls we might want to give people as individuals, how they might be used even at a political level is an interesting challenge.

MR. BREGMAN: That's a very rich topic. But it is probably time to move on to our next topic.

We started talking about the framework, about how we are going to analyze all these massive amounts of data. But, of course, it is also going to be stored somewhere.

We have two somewhat shorter presentations. The first one from Sal Capizzi. You don't have a slide but you can have a controller.

MR. CAPIZZI: Thank you.

Listening to all of the technology discussion here, I'm getting a little nervous, I have to admit. I thought I really didn't mind about not having a totally private life. But it appears that may be beyond my control anyway.

If we talk about all of this, we are talking about where do we store all of this information. That's basically what I wanted the talk about a little bit today, is the data storage aspect of all this technology and how will data storage moving forward be able to contribute to the ability to collect and analyze more information in a more mobile and more secure society.

If I had to give you one sentence to remember what I'm going to say, it is basically this. It is just that capacity is going to grow, and mobility by consumers and by employees has already been growing and will continue to grow.

That will equal convenience. Convenience always translates into risk at some level. So it is basically capacity, mobility, convenience and risk.

Those are kind of the four points. I guess that

was more than one sentence.

Let's talk about capacity for a minute. If you have been reading the news at all and some of the trade publications, you know that IBM has celebrated the 50th year of the Remick disk drive which held about 1800 bits per square inch on that platter.

We are at today about 100 gigabits per square inch. You can see it has really over the last 50 years or so has grown quite significantly.

All the data out there grows by about 50 percent per year. That's what we have seen over the last 50 years. Some of it may not be new data.

We are talking about backing data up on to tapes, putting multiple copies of the same information by different people.

It is not all new data. The fact that the storage capacity to hold it is growing by 50 percent each year. We are talking about disk drives.

When I started in the -- when I bought my first PC, I think I had a 2-gigabyte disk drive in it. I thought that was plenty.

But if you look today, my laptop has 80 gigabytes, and sometimes that's not enough.

When you talk about just text files and Word documents, that's really enough capacity.

Now that we are introducing more into the storage world, like PowerPoint presentations, music, streaming videos, that type of thing, all of a sudden we start looking and see that the current capacity really isn't as much as we originally thought.

If we look ahead, there's a technology that I want to bring up here that we talked about that's called perpendicular reporting. It is the ability to store the bits on a disk platter -- I'm not a disk drive expert -- store the bits vertically rather than horizontally.

What that will be able to do is increase the capacity by ten times what we see today. Can you imagine that? We are already talking about a terrabyte in a laptop. Now we are talking about 10 times that at some point.

Certainly we will find ways to fill it with music and video and other applications such as some of the ones we talked about here.

There is going to be so much data out there that it is just going to be phenomenal. What that translates into is concern because there's going to definitely be some privacy issues there. There will also be some security issues.

At Yankee Group, we did a survey and we asked our IT managers and CIOs. This survey was done

earlier this year. They happen to be in the transAtlantic wire survey. We asked them to rank their biggest concerns over the upcoming year.

Data security was the top, followed by service pricing and mobile device limitations. Data security is on the top of the minds of all of the CIOs and IT managers out there.

Historically, there was a modem on the data center, the IT manager could decide how that data was disbursed, who had access to it, and it was easily controlled and managed.

But today, if we talk about some of the figures that I just spoke about with capacities, people are going to be out there with laptops with a terrabyte of information, cell phones, PDAs with capacity on them to be able to do work.

Employers expect that when their employees are on the road that they are in touch and actually able to be productive during the times they are not in discussions or whatever. When they are waiting for their plane, they expect them to be accessible.

They always want to know what's going on, what their e-mail is doing, is there a little bit of work they can do on their report while they are waiting for their plane.

What it does to the data center is takes the control out of the data center. Now you have people who are all over the world geographically that need to access data for legitimate reasons.

We will see a stepped up emphasis on data security. We can talk about that for quite a while if we wanted to.

Basically, when we talk about data security, we are talking about authentication, making sure that the person that accesses that information is who that person says he is.

Authorization, does that person have the authority to access that information and do whatever manipulation that he is doing on it.

And then, of course, there is encryption, which is stating that, okay, if the data is on a laptop or a device or anything that could be lost or moved, is it encrypted so if it was found, could anyone actually use it.

Just a little statistic here. The Pullman Institute did a study that -- actually, I guess the word is they assessed a security breach at about $5 million per breach.

So if you think about it, if a laptop is stolen with a lot of data on it, personal data about Social

Security numbers or whatever, everyone has to be notified, everyone -- there has to be some recovery attempt. Then there are any type of remediation that may need to be done in terms of providing -- I lost the word I'm looking for here -- the credit checks, the Equifax credit checks.

That can turn into an insurmountable amount of money. If 10,000 people lose their Social Security numbers, they all have to be notified and some sort of remedial action is done.

That can be quite extensive. So, just one other comment here. Your CEO, John Thompson, at an event in Tokyo, he was quoted talking about the threats that are data storage. It is really not so much the viruses in the mail as much as it is the the intent to do financial damage.

Really what that is is people quietly trying to find out what your bank numbers and passwords are so they can take that information and use it to basically take money from you.

In the old days, viruses and mailware, you had to reload your operating system, maybe you lost something. That was good news compared to some of the things we may be facing as we move forward.

The face of data security is changing. The

emphasis is changing. The bad guys are getting very sophisticated and able to do a lot more damage than they used to be. Now they are able to actually drain your bank account, assume your identity and take out your credit cards and do other things.

The one other comment is the bottom line effect of this is really that the convenience for the consumer is going to translate into risk for identity theft and for privacy.

So what we will be seeing is more and more technology trying to address that. The convenience and mobility is all good news and easy. It is just how do you get off any ill-fated attempts at trying to access this data by someone who shouldn't.

MR. BREGMAN: Thank you very much.

David, you are a practitioner in the storage business as opposed to an analyst. You operate where the rubber meets the road.

MR. HITZ: Sal and I had a discussion before this meeting that Sal would talk about the theoretical and analysis and I would try to bring it home to people by talking about actual customers.

My company makes giant boxes of disk drives and sells them to giant corporations. Yahoo has 750 million e-mail boxes on our systems. All of the special effects

for Lord of the Rings and King Kong Harry Potter movies were stored on our systems.

What is more important is we work with our customers to figure out what are the problems you have if you are a large corporation that owns thousands and thousands of disk drives.

To figure that out, I have talked to a lot of CIOs. I ask them if something goes wrong with the data in your environment, what bad things happen.

Some of them are fairly straightforward. Amazon, if they can't get at their data, they can't sell books. Yahoo, if they can't get at their data, people can't transmit e-mail.

Some of them get a little higher level than that. If Southwest Airlines can't get at their data, none of their planes are allowed to take off because with all of the cargo manifests these days and passenger manifests, it is literally illegal for the plane to take off if they can't get to their physical data.

Here is another interesting fact about Southwest, if their systems were to go down and stay down for four hours -- and Southwest is one of our largest costumers; this is true of all airlines -- if their ability to access their data goes down for four hours, they are required at that point in time to ground

every plane in their fleet at the nearest airport.

So what did I just do? We are here to talk about consumers, and I started by saying we sell stuff to giant corporations and let's talk about the problems of giant corporations.

But all of the problems I talked about turned out to affect the consumer. As a consumer, I can't buy a book, as a consumer, I am sitting in a plane.

The most interesting one is what the CIO of a large bank told me. He told me the thing that scares him most is that his bank would end up in one of those headlines that says "bank exposes customers' credit card records."

And that's where you really get an interesting combination between data and ethics, because 10 years ago, there was very little combination or especially 20 years.

The data that large corporations had, maybe they couldn't close their books, maybe they would get a phone call from the SEC. But they weren't storing customers' personal information. They wouldn't get a phone call from the FTC most likely.

And that's a fundamental shift in what's going on. It raises real questions about what do we believe should happen if you lose somebody's data. If somebody

loses my medical records or my financial records and they didn't encrypt it, was that just carelessness, was it negligence, was it criminal, should we fine them, should someone go to jail?

If they lost my records, sending someone to jail, that seems extreme. But what if they lost the records of 100 million people? All of a sudden, that seems like a lot.

That's a crazy high number, but let me share a statistic. The Privacy Rights Clearinghouse says since February 2005, there have been 330 loss events involving 93 million people's records.

I think that's the key message here is that computer data storage now is so enormous that it boggles our ethical intuition. Do we throw the guy in jail for the rest of his life for losing that 100 million records or was it just a mistake?

Part of the reason that it boggles our mind is the amount of data stored is so immense. A one-terrabyte backup tape is about this size. It can hold enough data to give you the name, address, phone number, credit card number of every person on the planet. I can fit it in my pocket. How do you protect against that?

A large bank told me every year they send

100,000 of these tapes per year off-site to warehouses. So I did some math. The amount of data that fits on that one tape, if you were to print it onto paper, it would be 20 million pounds of paper. No one could steal 20 million pounds of paper. It is in a warehouse.

You put a guard in front of it. You certainly don't walk out with 20 million pounds of paper, "oh, look, it's gone, where did the 20 million pounds go?" Our ethical intuition is boggled.

But the guy who has the 100,000 tapes he sends to the warehouse every year, he told me I have high quality standards, I'm not supposed to lose any tape, I have all the Six Sigma stuff, if I meet every one of my quality goals, I will only lose six tapes per year. 120 million pounds of paper. Well, that's reassuring.

So what's the summary of what has happened in the last 10 years? We are storing more data and the data we are storing matters more.

What is my prediction for the next 10 years? We are storing even more data, and it will matter even more.

One tape will hold everybody's X-rays forever. Now, what if we lose that one tape?

So what can we do? One thing we have done already is a lot of the states have passed breach laws.

Breach laws are pretty straightforward. There is not much in the way of penalty, nobody goes to jail. All they say is if you lose customers' private data, you have to let them know.

That has been like a beacon shining on this stuff. All those headlines are because of breach laws. That has been a great start.

The one real downside is it has been done state by state. There are 30 different states with breach laws. If you are a large corporation operating in all 50 states, the federal government has taken a look.

I have to say it has been disappointing that the government hasn't managed to try and help rationalize this. The one bill that came through was after the VA data loss, the loss of the laptop. They passed a bill just about government guys.

So last week Starbucks lost a laptop. We are going to pass a bill about coffee shops next? It seems kind of one step at a time.

There is certainly is a self-interest by corporations about this. There was a study about how expensive it is to lose data. It is bad. And there are other examples of self governance as well.

Visa and MasterCard have very strong regulations about what their clients have to do. That is driving

clients to encrypt data and encrypting tapes which leave the building.

What I would like to leave you with is one simple observation. There is no quick fix here. This is an issue that I think is going to be with us for at least a decade or two as we try and come to grips with what do all these technologies mean, about what we would like to have them happen.

I would like to point out that we have been keeping records on paper or parchment or some kind of physical media since Roman times. So we have had two millenia to come to grips.

Ethically, Katrina hits and wipes out a bunch of dentists' offices. What was the dentist's responsibility for that paper that he had? It has taken us a couple millenia to figure that out.

We are not going to suddenly one year pass just the right Privacy Act to solve all these problems. It is going to involve what kind of neural networks, what kind of policy.

We will need to pull a lot of people together. So I guess the take-away message will be I don't think we are going to have the year of privacy. I think it will be a minimum of a decade of privacy.

My hunch is 10 years from now, we will be

storing 100 times as much data as we are now. And we will be right back in here saying "oh, my God, I never thought we would get to this point," and we will still be working at it for another 10 years.

MR. BREGMAN: Thank you very much.

I think at this point it would be interesting to ask the audience a question. And hopefully you have your polling devices, you haven't lost them yet.

So the question I want to ask is for you, what is most important in being able to store and retrieve your data? What is the highest priority for you? The capacity of storage, A; convenient access to the storage, B; or data security, C. So please enter your data.

So that's interesting. That's pretty consistent with what we were saying. Data security is the highest priority.

Capacity is good enough. You don't need to make bigger disks. You made the point it is moving so fast it is keeping pace. So people aren't concerned about that.

MR. HITZ: Hang on. I have a news flash. Okay, I'm not allowed. She told me a secret but I can't tell you and I respect her privacy because that is the highest ranked issue as reported by you guys.

MR. BREGMAN: We were having that discussion that we started off talking about artificial intelligence, and although you didn't say it this way, what has enabled us to think about that processing is the explosive growth of the raw compute power, the engine and the ability to aggregate huge amounts of computation in a very dense, concentrated place.

The issue that is driving a lot of these storage issues is sort of the analog of that, the fact that, as you said, it was 20 million pounds of paper, you couldn't --

MR. HITZ: You couldn't really look at it.

MR. BREGMAN: But if I take it out of my building, that's the real threat.

The thing that we haven't talked about is the network which then allows you to do that without somebody walking out with the tape or disk.

These are very thorny questions. I get a little bit worried too and assume it will take us a decade to get to the next phase. These are real issues facing people today.

MR. HITZ: If you are worried, you are in the right state of mind, at least.

MR. BREGMAN: This comes back to something that you brought up from John Thompson's comments last week,

which is that as we look at these concerns about privacy and data loss and lack of confidence, if you will, in the use of these new technologies, there is a real threat that because they become so ubiquitous, so important to our corporations and our personal lives, there is a risk of a backlash from the public, I don't feel confident, I won't do it and a lot of the economic strength of not only our country but worldwide and the economic development. People decide I don't want to enter that information, I don't want to do this online, I would rather have it on paper. There is an economic worry as well.

MR. HITZ: Technology does create these problems, but technology also brings some good solutions.

It used to be really dangerous to order something on the Web and the security encryption protocols that work over the Web. I type my credit card into the Web with some regularity. I'm comfortable doing that. Both PDAs and laptops from data centers, all that stuff is locked behind the doors.

But encryption technology can similarly be used to protect that. It is getting cheap. You can buy it and corporations can get it.

One of the things we sell is versions of the

stuff that are really -- there is counter technology that is helping solve the problems of the first one. We have to figure out how to use it. It is not like it is hopeless. Maybe that's the one thing I would say.

DR. HORVITZ: The economic value of the upside, both in storage computing and in the correlations and the analysis, the machine learning is so great that that will actually I think at times change the thresholds of tolerance. But more so I think the economics occur with laissez-faire thinking and reasoning makes privacy good business.

The idea is that there will be incredible incentives to grant people these kinds of value-added services and storage and access times, and that will pull along technologies that are usable in the privacy space. There will be lots of incentives to have that done.

MR. BREGMAN: There is also a kind of education or familiarity problem here. You talked about the fact that it is relatively safe on the Internet, and I agree with that, and we kind of understand that.

But there are a lot of people who don't understand that who hand their credit card to someone they have never met who takes it to the back room for five minutes and come back, and they don't know what has

happened to it. But they are afraid to put it into an encrypted channel on the Internet.

So I think there is some education that is needed there and understanding among the population.

MR. HITZ: When you were talking about Eric's artificial intelligence kind of stuff, you mentioned a couple times that data goes out into the network and who knows where it has gone.

I see this technology as part of the solution. The bad news about sensor networks is if I want to find out if the old person is dead in the room, I have to send that sensor data to some live person to look at the data. And now all these issues come out in the front.

If I connect to the Internet system and the computer is looking to figure out if the old person is alive, maybe I can keep all the data ever from leaving my house. Right? Now it is more in my control.

You connect these pieces together, his sensors, his AI, keep the stuff inside the network, keep it encrypted on the disk it is on, all of a sudden it doesn't look so scary. I think the pieces can fit together.

MR. LAMARCA: This is the thing about data that scares me, more secure about my data. There is actually someone that handles data more important than my

financial records every day, and it is me.

Somewhere the kids that are being born now, they are going to be bonding in the dorm rooms at colleges and saying "oh, you have no baby pictures because your parents lost all the pictures of you because they stored it on a PC," which fundamentally hasn't changed but still it has fundamentally unreliable storage.

We have to change. We are putting in critical data. It is awful hard to destroy a picture you get from Kodak. There is a lot of information in the consumer space as well, it can certainly handle more than a hundred personal records.

MR. HITZ: I have a USB-attached drive and I copied all my photos to it, and I put that thing in a fireproof safe. How many people here have done that?

MR. LAMARCA: I don't have a single hard copy.

DR. HORVITZ: You do that process and realize you have deleted all your photos by accident.

MR. BREGMAN: I think we need to move on to the last piece.

We have talked about sort of the technological elements here. The last presentation we have Dr. B.J. Fogg, who is going to talk about persuasion.

Maybe this is the culmination of all these put together, how persuasive technologies can be used.

Dr. Fogg is in California on the phone.

DR. FOGG: Yes, I'm here.

MR. BREGMAN: I understand you are going to make some comments and there is also a video presentation. I turn it over to you.

DR. FOGG: I sent ahead a video. There are some things I want to show that would have been hard to do remotely. The video is just over 10 minutes. And then we will have the discussion.

(Whereupon, the video was played.)

DR. FOGG: Usually I look on the good side of persuasive technology. I like to see the positive things that computers can persuade people to do in terms of their health, conservation, education and so on.

But today I'm going to worry a little bit. I'm going to look at the potential dark side of what's happening now and what could play out in the next 10 years.

Of course, persuasion has always been part of human existence, but now that computers can persuade people, the landscape gets changed.

There are six aspects of this that I have discussed elsewhere. But the big picture is this: We can now create machines that can change what people think and what people do and the machines can do that

autonomously.

Persuasive technologies are here and more are coming. This introduces something new into our world and has pretty big implications for how we need to educate and set policy around persuasive technology.

There are three areas I'm going to talk about today. Number one, misplaced trust; number two, seduction through video games; and three, persuasion profiling.

First of all, misplaced trust in Web sites, in other words, what leads people to believe or not believe what they find online.

I have done a bunch of research in this area that has been confirmed by others, and in some way it shows that people make superficial judgments.

If the Web site looks good, they tend to believe the information. We are all cognitive, we don't like thinking very hard. And this plays out when it comes to the Web.

If it looks good, it is good. Number two, misplaced trust in people we encounter online. You have heard quite a bit of this in the last year or so about predators online. But still this will continue to be a problem.

The typical cues we have in the real world for

evaluating somebody's trustworthiness, those cues get mostly stripped away online, and we have to rely on a slimmer set of cues or new types of things, such as reputation systems where people get points or stars.

These are going to be important and even more important as we move forward, but people will find ways to circumvent or to confound these systems, and some people will get confused and place trust in people they shouldn't be trusting online.

Misplaced trust in what we see, the same goes for seeing is believing. But that is changing quickly. Even though you are watching your video on a Web site that has a credible brand, they take no responsibility for the video.

(Whereupon, the video was played.)

DR. FOGG: The first time we have video as a medium that people can access that the video has no editorial control to it. Certainly people will begin to manipulate videos in ways that will be hard to believe.

In some ways we will have to learn not to believe our eyes. That learning curve will take a while.

We are wired to believe things that we see, and to be initially skeptical or to take the extra effort to be skeptical is going to be difficult. It is not how we

are naturally as human beings.

So those issues around misplaced trust will continue to grow.

Let's move on to topic number two, which is the seduction of video games. Video games are huge, and they are only going to get bigger. The issue in video games is that they convey a set of rules to the user, they set up their own world with their own cause-and-effect relationships.

These cause-and-effect relationships don't always match the real world. For example, try this particular car, clean up the environment; raise taxes, the people will riot.

So these cause-and-effect relationships are transmitted through the video game. People are playing these games. They are not thinking critically about the information or the cause-and-effect relationships, but those relationships are sinking in. They are getting a feel for cause and effect.

Some of these cause-and-effect relationships are haphazard, they are unintended, it is just for the fun of the game. But as we move forward, the cause-and-effect relationships can be designed specifically to change people's attitudes and eventually their behaviors.

We have to be on the lookout for video games that are about persuasion and conveying cause-and-effect relationships that might be harmful for people or for communities.

Now I'm going on to topic number 3, which I call persuasion profiling. To understand this, you need to understand there are a finite number of persuasion strategies in the world. People differ in their opinions.

Now, persuasion profiling means that each one of us has a different set of persuasion strategies that affect us. Just like we like different types of food or are vulnerable to giving in to different types of food on a diet, we are vulnerable to different types of persuasion strategies.

On the food example, I love old-fashioned popcorn, and if I go to a party and somebody has old-fashioned popcorn, I will probably break down and eat it.

On the persuasion side of things, I know I'm vulnerable to trying new things, to challenges and to anything that gets measured. If that's proposed to me, I'm going to be vulnerable and I'm going to give it a shot.

Whenever we go to a Web site and use an

interactive system, it is likely they will be capturing what persuasion strategies work on us and will be using those when we use the service again. The mapping out of what makes me tick, what motivates me can also be bought or sold, just like a credit report.

So imagine I'm going in to buy a new car and the person selling me the car downloads my credit report but also buys my persuasion profile. I may or may not know about this.

Imagine if persuasion profiles are available on political campaigns so that when I visit a Web site, the system knows it is B.J. Fogg, and it changes his approach based on my vulnerabilities when it comes to persuasion.

Persuasive technology will touch our lives anywhere that we access digital products or services, in the car, in our living room, on the Web, through our mobile phones and so on. Persuasive technology will be all around us, and unlike other media types, where you have a 30-second commercial or a magazine ad, you have genres you can understand, when it comes to computer-based persuasion, it is so flexible that it won't have genre boundaries.

It will come to us in the ordinary course of our lives, as we are working on a Web site, as we are

editing a document, as we are driving a car.

There won't be clear markers about when you are being persuaded and when you are not.

These are some of the challenges we face moving forward and educating about computers and changing attitudes and behaviors.

MR. BREGMAN: That was certainly very stimulating. The question it raises in my mind or the thought it raises in my mind is that a lot of these technologies as they become more commonplace and ubiquitous will become invisible and blend into the background, the artificial intelligence capabilities which become a facility but we may not think about them.

Data storage is already there, where we store all our digital photos. These persuasion technologies can presumably be used for good or evil. It is one of the things we need to watch out for more carefully as we move into the next Tech-ade.

I think we are out of time. I don't know, Dr. Fogg, if you want to make one very short closing remark. Then we will wrap up this session.

DR. FOGG: I will make a short remark. I know a lot of our discussion today is about privacy. The next layer is about vulnerability.

Who knows what our vulnerabilities are, how they

unfold and how do we stay in control of that, especially given the global nature of our interactions these days.

MS. MULLIGAN: Since basically all my time is gone, I will take the liberty of commenting on some of the storage stuff, because I think I responded to some of the sensor network stuff.

The remote storage issues, most of the storage we are talking about, Dr. Horvitz talked about some of the storage on the client side, for the foreseeable future we are talking about remote storage.

Today our privacy framework at the federal level is the difference between whether or not data is stored on my personal computer or whether it is stored away from me on some third-party server.

It makes all the difference in the world with regard to the privacy protections individuals have, with respect to third-party requests for data and government requests for data.

It doesn't map very well on to individual's normative understandings of privacy, that if I store my calendar on my hard drive or I store it at MSN Calendar or Google Calendar, it is still my calendar, and I expect to be able to have the ability to control who has access to it, and if the government wants access to it, to at least get notice the fact that they requested it.

The fact of the matter is under the statutory framework established right now, if I'm storing it on my hard drive, it is the same as if I am storing it on a piece of paper or under my bed.

If I am storing it at Google or Microsoft, if somebody wants it, the government, another third party, I might not ever even be told or I might be told well down the line. It is unclear.

Some of the calendar services that are out there, you can imagine them deciding this is a useful place to do different kinds of data mining and collaborative filtering, how popular is that really.

It is really significant in thinking about the storage, the security aspects. I was a participant on a Federal Trade Commission federal advisory committee on online access of security back in 1998.

One of the most striking things about that group of individuals, there were many computer security professionals, people in the accounting and the insurance areas, and there was no market for security.

It is true that people were focused on security over the wire or security and transmission. Nobody was focused on the security of the data once it was in storage. We know now, in large part thanks to the legislation that started in California which I had a

small hand in, that security of data in storage, particularly on mobile devices, is a huge issue.

And I think it is really important -- it is obvious we have no privacy without security. And we really do need security standards.

It is a very difficult nut to crack in that we actually don't know what produces good security today. If you ask a computer security person, they will say you need good threat models.

But it is impossible to say the system is secure. You could always say it is secure based on these threats. So what we are going to end up with is some process model for evaluating security, not some you have to use X-type encryption.

But I think it is really clear if we continue to see storage grow, as I think you are absolutely right we will, we need to take security much more seriously. It is an issue not just of personal privacy but it's an issue of national security.

MR. CAPIZZI: The comment I want to make is in the past we have been focused on the security of the device.

MS. HARRINGTON-MCBRIDE: I'm so sorry to cut you off. I have a whole corral of people who want to talk with you all about RFID, which happily is an extension

of this topic.

Thank you very much to all of the panelists and the moderator.

Stay tuned for more. We are going to take a shorter break. We have so much content that we will have to cut down on time.

Be back in 10 minutes. Thank you.

(Break and Technology Pavilion.)

MR. MAXWELL: I would like to welcome you all to the next panel.

After the swimsuit competition, we will move -- it really is a wonderful opportunity, and I'm grateful to the FTC for enabling me to do this.

A number of us have talked together about RFID, but the more we talk about it, the more we see applications that are taking place in the market or that are likely to take place in the future.

And the more realize that, you have lots of wisdom in your own heads about this and lots of ideas about it.

We all learn from one another because the technology is still emerging. It is an infrastructural technology in the sense that it is only limited by the imagination of the people who choose to make use of it.

We can't define it or limit it very tightly to

say it is going to be this or this or that, because it will be what people like you do with this technology.

That makes it a little bit harder to talk about but makes it terrifically interesting for the people who see some of the possibilities to benefit from it.

With that prefatory comment, the only rules we have to follow is time limits. But everybody here is smart enough to know they have useful things to say. As we proceed, people shouldn't feel constrained by their place in this setting to comment.

We will start it off with the Center for Aging Services Technology video to set the stage for this first part, which will focus on RFID and health and wellness.

(Whereupon, the videotape was played.)

MR. MAXWELL: The first speaker is going to be Joshua Smith from the Intel Research Lab.

MR. SMITH: Thank you.

Okay. So I'll get started. I'm going to sort of refer to the CAST video in my talk.

I will start by talking a little bit about what RFID is. There are a lot of proposals and ideas in the CAST video. I will pull out a couple of them and explain how RFID can help enable a couple of those ideas.

I will be making three points, explain how today's RFID can be used to help with activity monitoring and an actual trial my colleagues are beginning that are doing some of the sorts of things you saw in the CAST video.

Then I will talk about where RFID is going, some new capabilities that we are building that we believe will become more common in the future.

And, finally, where we think this could go longer term, beyond the vision of kind of monitoring people to help them, the idea that you maybe could provide some robotic assistance to people living on their own, and we think that RFID can help with that.

So just to explain what RFID is, one way to think of it is as kind of an electronic bar code. The difference from a bar code is a line of sight from the reader to the tag is not needed. You go out to the grocery store, they are always orienting the objects to the laser reader.

With RFID, you don't necessarily need that to happen. An RFID tag consists of a chip, an antenna that is powered wirelessly by an RFID antenna.

The things at the bottom of the picture down here are RFID tags and this is a reader. In a moment I will show you so you understand what RFID actually does.

It is kind of an unusual video of an unusual kind of RFID.

There is going to be an RFID reader in the shoe here. You will see as I touch these different objects the machine is recognizing which object is which. That's sort of the basic capability that RFID has.

Could we play the video now, please.

(Whereupon, the video was played.)

MR. SMITH: Just showing these RFID reader shoes seemed like a good idea back in 1999 when they made this video. So as my colleague is grabbing these objects, you are seeing that the machine is recognizing them, and that's the basic capability that RFID provides.

Now, what is actually happening is there is a unique ID coming out of the chip, and in this case the system knows how to correlate those IDs with particular objects. It provides the capability to recognize objects.

That's one way to think about the underlying capability of RFID. What does that have to do with the video that you just saw?

One of the sort of proposals in that video was the idea that you could sort of check the family member and the care network, check on the elder's status.

You saw at one point someone look on a Web page,

and there is a little indicator of activity or something like that. The basic idea is that what caregivers and elders use, what physical objects they interact with can tell you a lot about what they are doing.

The images you see on the top right are taken from an invisible man movie. He is brushing his teeth and talking on the phone in one of those pictures.

You can tell what the person is doing just by seeing how the objects are manipulated. The idea is using RFID, you can basically implement that capability and understand the activities of daily living that an elderly person is doing with a bracelet RFID that you see there. In the CAST video, there was a watch.

And having RFID on objects like a tooth brush and toothpaste and then their care network can check on some kind of a the interface to see how they are doing.

So that was an idea that was in the video that is possible with RFID. My colleague Matthai Philipose is beginning a project to implement that. He has partners like the Washington State Aging and Disabilities Services, National Cooperative Bank Development Corporation, 20 inhome clients and 20 resident clients.

It will be with a paid provider, because part of the purpose of this study is to figure out what is the

business case for this. The quick observation is that long-term care which is hands-on assistance with fundamental daily activities is labor and cost limited.

41 percent of the cost of that is labor. It seems like there is tremendous opportunity to bring more efficiency to that. You can imagine it happening in different ways.

We believe that this RFID monitoring can help with that.

To give you a sense, right now social workers and other caregivers have these very detailed lists of activities that they are supposed to help people with, and there are various reasons you have to check on whether or how often those activities occurred, both for billing and other reasons.

RFID used for activity monitoring can potentially help with that. As I said, we are now beginning actual trials to test that out.

So now I'm going to start talking about where RFID is going to go in the next 10 years.

So if you think back to Tesla, he made a lot of interesting predictions. He is predicting the cell phone with cameras in it, but at the bottom he talks about more important than this will be "the transmission of power without wires."

You might think of that sort of hasn't happened yet. RFID is an example of wirelessly powered devices.

So far they don't do much. But due to some other predictions, here we have Gordon Moore talking about the number of transistors incorporated in a chip will double every 24 months. He is driving a lot of the change everyone is talking about today.

Those two things put together mean that RFID by 2016 will have a lot more capabilities than we see today. If we think back to 1968, one transistor costs about a dollar. By 2004, you could get 10 million transistors for a dollar.

If you project that ahead to 2016, you expect 640 million transistors for a dollar. So if an RFID tag has 100,000 transistors in it, then farther out in the future you can expect it will be five dozen for a penny.

Unfortunately, RFID tag cost is dominated by other things as well. That price, 640 million for the dollar, is really the volume discount. You can't really necessarily buy 100,000 at that price.

What I think this means, to sort of put it very coarsely, is that future RFID tags will do more for the same amount of money. To put it very crudely, they will get smarter, not cheaper.

There is a more nuanced position than that, but

to keep it simple I will put it that way for now.

If you look at energy consumption, that's coming down too. Those two things together mean you could now build RFID tag-type devices that are powered wirelessly but do much more.

What I'm going to show in a moment here is basically a homemade RFID tag that talks to an industry standard 915 megahertz reader. In this case I dressed it up to look like a picture frame. What is on it is a microcontroller, a programmable 16-bit computer, and also a three axis accelerometer.

As I tilt that object back and forth, you will see the planet Saturn tilt along with it. If we can go to the video now, please, we will show that.

I'm controlling the remote control myself there. As I'm tilting that object, you are seeing the planet tilt along with it.

The important thing, in case it isn't clear, is there is no battery in that device. It is being powered by radio waves the RFID reader is putting out. It is receiving power and data from the RFID reader and talking back.

What it is sending back is sensor data. It is not just saying the same thing over and over. It is actually saying a different thing every time, saying

this is how I'm being tilted.

You can imagine that for health and wellness applications that might have other -- might present other opportunities as well.

So we talked about in the CAST video there were a lot of examples of measuring physiological parameters. This will allow that to happen without requiring a battery to be changed.

You can imagine generalizations of the kind of activity monitoring that you saw rather than telling that the person has come near these objects or touched them. If you can measure more about what has happened to the objects, you can learn more about what the person is doing.

Finally, I'm going to talk a little bit about a new project that we are just starting now. So the activity monitoring work that I mentioned earlier started as a research project several years ago, and now it has progressed to the trials in the real world.

We are now starting a new project to go beyond that. So activity monitoring you can do quite a bit. Our thought is a step beyond that is activity assistance.

If you have a robot that is in the environment with an elderly person, that could potentially help them

in many ways. We have done -- a couple years ago my colleague Dirk Haenkel did a first step with a robot with an RFID reader in it.

One thing I should say here is object recognition has been a hugely difficult problem for years and years, recognizing objects. RFID may provide the opportunity to shortcut that problem. It may be the fixed-wing aircraft when people have been trying to do flapping birds.

Our hope is RFID will actually help and sensor networks the whole infrastructure that you saw for activity monitoring. If you start to put a robot into that environment, it can probably do a better job than a robot working on its own.

The kinds of things you can imagine in a medical setting are robot with RFID reader that can fetch important equipment or the robot can physically bring the medication and water to the elderly person as well as verify complaints.

It is a step beyond the little thing that beeps and says "take the medication." It is bringing the medication in and giving it to them, for example.

So to conclude, there are already real world trials beginning of activity monitoring applications based on today's RFID technology. I think by 2016 that

could become widespread.

RFID itself by 2016 will be a lot more capable, I believe. Sensing and computation I think will certainly be possible to integrate into RFID tag devices.

You can imagine using that for location sensing, physiological sensing, environmental sensing, many of the kinds of things discussed in the sensor networks presentation. Some of those things you could do with RFID-type infrastructure.

And then the step we are looking at beyond all this is going beyond activity monitoring to robotic activity assistance built on this infrastructure that's being put together now for activity monitoring.

Thank you very much.

(Applause.)

MR. MAXWELL: I want to hold the discussion until the next presenter, Mr. Richard Adler of People and Technology Research Affiliate with the Institute for the Future.

MR. ADLER: Good to be here with you. What I'm going to talk about will touch on RFID as just one flavor of a solution for a big problem. And the problem is I'm coming at this from the standpoint of the health care system and what is the role that technology,

particularly monitoring wireless technologies can play.

It has the potential of fairly fundamentally restructuring the health care system from one that is focused on acute episodic care of illnesses in specific places like hospitals and clinics to what I'm calling any time, any place health care.

The driver -- you heard about this yesterday. I will start with the big demographic trend, and that is the aging of the population. This is what is going to happen to the U.S. population over the next two decades.

Essentially the only group that's really going to increase dramatically is the population over the age of 60. All the other groups will grow very slowly or in the case of one age group, middle age, will actually decline.

There will be a 70 percent increase in the older population. There are lots of implications of that. That shows the per capita expenditures in health care by age. They start to increase in middle age.

It is really at the age of 60 or 65 where the hockey stick turns up and health care expenditures start increasing dramatically.

The reason is that as people get hold older, they tend to develop chronic conditions, arthritis, asthma, diabetes, heart disease, pulmonary problems. In

fact, nearly one-third of all people over the age of 65 have at least four chronic conditions.

20 percent of the population over 60 had five or more chronic conditions. This group is responsible for more than half of all health care expenditures in the country.

If we are going to do anything to get our arms around the really exploding costs of health care, clearly we have to do something about this problem, about the fact that we have an aging population.

Older people develop chronic conditions, and managing those chronic conditions is very expensive. We have a health care system that is not very well designed today to deal with this population.

The question I'm going to ask is something as simple, probably something everybody in this room has in their pocket, a cell phone, and is that potentially part of the solution. I just want to look at that.

One reason why cell phones are interesting is that there are a lot of them out there. We have seen a real explosion. We have heard a number of people talk about that.

As of 2006, there were 219 million mobile phones in use in the United States. Something like three quarters of the adult population in the U.S. now have

cell phones. It is becoming relatively pervasive.

Not only that, it is pretty well spread across the age groups. Mobile phone is related to age to some degree, but usage is still impressively high overall.

Among all adults 18 to 59, penetration is over 70 percent. Even for people in their 60s, penetration is over 60 percent. Nearly two-thirds of people in their 60s now have a cell phone.

And even of those 69 and older, the really oldest old, more than 40 percent of them have a cell phone today.

We have got -- really just the way the computer and the Internet became a pervasive environment a decade ago, that is what is happening with cell phones. It is the reason people think this is the future with a lot of technology.

The other thing that has changed is the technology itself. On the left is a man named Dr. Martin Cooper. He was the general manager at Motorola.

He was the man who made the first truly modern cell phone in 1983. He is holding something called the Dynatech. This thing weighed 28 ounces, it had no display, no memory, you could talk on it for 35 minutes. You could dial, talk and listen. It cost a cool $4000.

Today cell phones are so pervasive we don't even notice them. Just for comparison, Motorola today has a phone called the V80 that is midrange. Instead of weighing 28 ounces, it weighs under 4 ounces.

It has a display with 65,000 colors and a nice size to it. It has four megabytes of memory. Instead of 35 minutes of talk time, it has six hours of talk time. Not only can you dial, talk and listen, it has the phone book, screensavers, text games, a clock and alarm, a megapixel camera, MPG4 music player and Bluetooth and it costs $140.

Cell phones are also not just a U.S. phenomenon. These stats are truly remarkable. There are 2.5 billion phones since I have updated the figures. 2-1/2 billion phones in the world, expected to reach 3 billion before the end of 2007.

That's about 25 percent of the entire world's population now have cell phones.

Among the fastest growing markets are Africa, growth rates of 100 percent a year, India and China.

If we look at cell phone penetration by country, U.S. is kind of in the middle. There are now over 30 countries in the world where cell phone penetration is over 100 percent. In Italy it is 106 percent. In Singapore it is 126 percent.

What that means is there are people that have more than one cell phone, just as the average household has more than one television set.

It is truly becoming pervasive. The question is can this be used as a platform to deliver the kinds of applications we are talking about.

It's still the early days. These are applications that are just coming out of the lab into the marketplace. This is one of the ones that has been around for a while.

This is a company called Cardionet out of San Diego. It is a wireless heart-monitoring device. In the old days, you had to go into a lab and get wired up and that would be the data that your cardiologist would have.

A more advanced device called a halter monitor was developed which was a battery operated thing people could wear out in the world. It weighed 75 pounds and would let you record a day or two of data.

The cardiac monitor you can use for a week or two weeks or as long as a month. The advantage of it is it is able to detect problems which are infrequent and send them directly to the care giver in realtime. It has been used over 50,000 times. It is well accepted now by cardiologists as a very effective monitoring

tool.

Glucose monitoring for diabetics, this is a glucose phone. It has -- into the back of it has a built-in glucose meter for the diabetic to take samples of blood and put it into the back of the phone and it gives a reading and also uploads it to a database that either the patient him or herself can access or the caregivers.

These are currently on the market in South Korea but not in the U.S.

One of my favorites, this is the use of text messaging. Text messaging is getting to be popular in the U.S. It is wildly popular in most of the rest of the world.

This is a really simple application, no technology. It was done by some doctors in New Zealand. They got a group of young people who said they wanted to quit smoking, and when they signed up, they put them into two groups, an intervention group and control group.

The intervention group got five messages a day that tried to encourage them to stop smoking, funny, supportive messages, and after three months, the quit rate among the intervention group was double that of the control group, from that little bit of support they were

getting and, again, cost being very low.

This is something called My Food Phone. It comes from a company in Canada and is being sold in the U.S. by Sprint. You take a picture of each meal and it gets uploaded to a database, and once every two weeks you get a personalized 60-second video from a registered nutritionist coaching you for diabetic purposes or dieting to manage your nutrition. The basic service costs $10 a month.

A rather different class of application is implantables. I think this is really where the future will lie. On the left is something called the CYLOS pacemaker. This gets implanted in people who need it.

It will not only detect irregularities of one's heart. If it detects irregularities of the functioning of the device, it calls up and says you need to come into the garage and get it fixed. On the right is an RFID chip from Verichip. It is the first human implantable RFID chip.

I first talked about this in June. I gave this talk at a conference, some day these things will be implanted in people.

The next month in July, Blue Cross-Blue Shield of New Jersey announced a trial with 126 chronically ill people who were going to get these things implanted and

carry them around.

Last week there was an announcement of a company related to Verichip that said they now have patented a chip which will not only give identity but actually measures, continuously reports glucose measure levels. Somebody who is diabetic would no longer have to prick the finger. That function would be built in.

Finally, the next generation application about to be launched in the UK, 3G Doctor. This will provide for about $50 a two-way video consultation with a registered MD. This is going to be literally the doctor in your pocket.

This is the next, next generation, probably in the future. This is a bioengineered cell rover that would swim through the human body performing such useful tasks as drug delivery, intracellular transport of cellular repair. It would have a deployable submillimeter band to report on its progress.

To sum up where we are going, from the clinic in the hospital, from health care where you go to it, it will move out into the community any place at any time. There is a whole host of issues this raises about where liability resides, who is going to be responsible for the data.

One of the big gating issues right now is the

one of reimbursement. Beyond this, I think the real disruptive power of this technology is here, and this is where I think we are going to a real reconfiguration of the health care system, where instead of the health care system being the center -- we have heard this theme -- it is going to be the patient at the center in an environment, a complex ecology of health services.

And then we have really big issues about how do we assure quality of the information, who protects the consumer, what kind of rules are going to be needed in this brave new world.

Thanks.

(Applause.)

MR. MAXWELL: Our applause is self-congratulatory because it is within our time bounds.

Josh, I was wondering if you look at the CAST video from a technology standpoint, what are the things that stand in the way of reaching that kind of accessibility?

MR. SMITH: That's a good question. What are the most difficult things? Well, a lot of it I think is actually not that far out.

Many of those things are actually technologically possible right now. There is a lot of

work to do to figure out how to get the medical system to take this up and change the payment systems and things like that.

I'd say there is certainly a lot of work in that, probably more work in that area.

I think figuring out how to actually -- I think power is an issue for many of these things. If people have more and more gadgets that they are supposed to keep powered up, I think that is a challenge.

I think just the uptake of RFID is something that the more uptake of RFID there is, the more feasible it is to do this kind of thing.

I think if you are talking about as in the trials we are looking at, we are thinking about attaching RFID tags to preexisting objects. There are some physical sort of industrial design challenges with that, making that actually happen and making them stay.

Clearly, if RFID uptake happens more quickly and things happen or if any tags are in them, that would make it all much more feasible. I think depending on the model, you may or may not actually require that.

I think for many of these applications it is not required to tag everything in sight. You just need to tag a few high-value objects.

If you are talking about in, say, a home, an

elder care home, it is much more feasible to do these special things.

Others may have thoughts on this question too.

MR. ADLER: The thing I think is most unrealistic or futuristic about that scenario is it is a single system. Somebody works on one piece and it is great if it were to all work together in a seamless, integrated package. It is somewhat easier to do in a visionary film than to deliver that in the real world.

The integration of these various kinds of services, there are some interesting services there. There are a lot of others that will come along and compete with that as well. One of the big questions will be one of interoperability.

There is a new consortium called Continuum that is trying to come up with some open standards for the integration of a variety of applications.

MR. MAXWELL: There should be a disclaimer about any panel that talks about the future as it is a lot easier to talk about the future than to do it.

So we can talk about all of these things and the networking that will bring us some marvelous results, and to engineer them and operate them and pay for them and integrate them is a very, very difficult and time-consuming thing.

We are getting better at it, but it is easier to make the film than it is to make the world.

MS. HUGHES: Especially in the health care area. Some of the start-up issues we are going through in the retail environment, when you don't have accurate data, there you lose a couple cases, and that's one thing.

In the case of health care, where you are dealing with the accuracy of the data and the accuracy of the technology, the start-up will be more important to get right from the get-go.

MR. MAXWELL: If you talk about the health care arena, that will make this even more difficult. If we think about what we would like to know in health care in the year 2016, we want to know the genomic makeup of the patient, we want to know the family history of the patient, we want to know the individual history of the patient. We want to make this available everywhere that a patient might be treated. We want it to be protected and secure.

And they are the questions that we talked about earlier in the sensor panel, about who has access over what terms and conditions when the consequences of disclosure are somewhat greater than I bought a tube of Crest toothpaste, where the consequences may be employment opportunities, may be how people are treated

by their friends and neighbors.

These are very different sets of issues we are still trying to wrestle with and where the health care area probably poses the most difficult of challenges for information security and for progress.

DR. JUELS: The CAST video was particularly interesting in that it cast light on not only those sensors and RFID but they can also improve privacy in bringing independence to the elderly who might otherwise be in assisted care situations.

MR. SMITH: These kind of sensors may be less intrusive than other alternatives such as cameras.

A lot of people would prefer to know that their toothpaste is picked up but not be videotaped brushing their teeth.

MR. MAXWELL: This is where the stakes are particularly interesting, because the potential benefits are so high of being able to harvest this information to use it for good purposes and the countervailing risks for it, the values we have held in the past are more threatening.

We will be doing a lot of thinking about this in the medical area in particular and where there hasn't been a sort of societal agreement about how to treat this. It is an issue, the issue of interoperable health

care records.

I think we need to move on to the next section which will be on entertainment and information.

We have another video, "The Korean Ubiquitous Dream Hall."

(Whereupon, the video was played.)

MR. TERSTEGGE: Thank you. I can't actually read this. I'm impolite enough to do my presentation from the big screen.

First of all, I would like to thank the FTC for inviting me here from the other side of the Atlantic to give a presentation on digital lifestyle technologies and some policy considerations for the 21st Century.

The 21st Century, as you saw just in the video from LG, is going to be the ambient technology age. It is the age where machines will no longer do or think but they will perceive what is happening in the real world around them.

It means that we will get adaptive spaces which can react to presence, circumstances and context.

Machines in the background of our smart home or smart car can sense our temperature, our health, our moods and our behavior and react to them.

Ambient technology means that the whole intelligence will be integrated into the background of

our real environment.

It is so small that it can be embedded in everything. It can be embedded in our clothes, in our food, in our fridges, in our washing machines, you name it. And it can anticipate what we are doing and adapt to our needs.

How we think of it, of ambient intelligence at Philips, is a series of small maids and servants that we need to live our daily lives. And it means that we will have a relationship with the technology, that we really need to know why it is here, what it's doing, what it is doing for us and how it will react to whatever we want it to do.

You have to build the relationship with the technology. We are no longer using technologies, but we have a relationship with our servants and our maids which are now the technology and no longer people or machines.

The drivers for ambient intelligence, of course, is the improvement of the quality of life. It is made possible by miniaturization. The technology is now, as you saw before in Intel's presentation, RFIDs are just so small that you can hardly see them anymore.

But it is also driven by civilization. We don't want to use people anymore to do our jobs and serve our

needs. So we have built machines, and now we have come to technology which is integrated in the background of our daily lives.

If we are going to use ambient intelligence, it must be relevant to us, it must have meaning to us and we must understand it. Otherwise, we will not use it.

And it must have built-in good social behavior, so to say. It must do whatever we would like it to do, it must give us a good feeling about the use of the technology.

And it cannot be impolite to other people.

And it has the ability to learn, and this is a very important factor. Technology that can learn will change over time, and we will still need the experience in the future, the same as we have the experience when we bought the technology.

So the technology that is learning, we have to really take care of how the technology learns, what it learns and whether we can raise its memory.

I show you some visions of the future as we see them at Philips. You see the smart bedroom where the bed is actually a smart bed which can monitor your health or your body stats while you are sleeping.

You see the intelligent hospital room, where people are more like a guest than a patient. People can

talk with friends on the integrated screens on the walls, and the body stats are also presented on the bed.

The intelligent museum, where you can have more information about art objects than just what is on the normal panels nowadays or the intelligent public spaces, where people can actually interact with the structures on the street to access their personal contact.

We actually just closed, finished one of our research projects, how people can securely access their home content, their home e-mail, their home pictures, their home whatever, the health aide, their health records of their children remotely from anyplace in the world and can also give access to other people, like a school teacher or a house, to actually enter and access these data.

Ambient intelligence is now, in our view, moving from the emerging type of ambient intelligence where you would just have -- you probably know the screens with the light that we are now selling.

But it will be moving to work toward ambient assisted living, where people are monitored. We already heard it before. They are monitored in such a way that they feel safe, that they belong to society and are not stuffed in an elderly home but they can still live an independent lifestyle and it is stimulating.

We are now having, for instance, a very interesting research project where people are being exposed to light, people with beginning, starting Alzheimer disease, exposed to light, they need to be exposed to a certain light for an hour a day. And if you do that, then their hospitalization will be moved forward or will be postponed, I would have to say, would be postponed about two years.

This is an enormous advantage. But you have to monitor it 24 hours a day to know that they have had the one-hour exposure to the light.

I gave you a few examples. In our research labs, there are too many examples to choose from. I just gave a few examples.

For instance, we have the personal fitness coach which will show your body stats and activate your training. We have the smart kitchen, where you can have product information, et cetera, and smart objects, which can localize themselves so you know that they have moved away from you.

The uWand approach is a very interesting one where you can with remote control, you can use your finger to remotely change whatever you want to change.

I think I have to stop now. It is too bad. I am actually going to the very last slide on that page to

do some -- this one. Sorry.

The ethics of ambient intelligence, important to us. Ambient intelligence can give people the feeling of having a big brother watching you. It can also give them the feeling of alienation, that they don't know what is real anymore, and it can restrict autonomous thinking.

Ambient intelligence needs to be implemented in a very thoughtful way.

Actually, there is a concept being developed called Voice Beyond Choice which is not that you give people the choice to actually use or don't use or opt in or opt out but they are given a voice towards the industry, towards society on whether they want to use this technology, yes or no.

I would like to point you to the SWAMI project, which is the safeguards in a world of ambient intelligence. It is a project sponsored by the European Commission. It goes into a lot of these issues and it is very interesting reading.

Thank you.

(Applause.)

MR. MAXWELL: David Turner from Microsoft now.

MR. TURNER: I'm going to sit here and talk about some of the things I have heard today and how some

things that are already available could probably fill in the gaps of some of the scenarios we have heard today.

One of the ones that struck me this morning, somebody raised the notion of the Minority Report and the custom ads following Tom Cruise as he walked down the sidewalk, and the issue was would people like that or not.

In talking to people beside me, they discussed that may be okay if you indicated that was something you liked at that moment at that time in that context. The challenge is often how do you make that indication.

With a lot of the discussions you heard about RFID, and typically when you hear about RFID in the news, you are generally hearing about a longer range variation of a radio frequency mechanism for reading information from a tag.

There's another variation on this that isn't as well known or usually thrown in the same bucket called near-field communications, or NFC. It explicitly works in the very short-range scenarios of a few centimeters, up to 10 perhaps, 13.5, 6 megahertz, contact payment cards. They are all based on the same basic technology.

And the advantage of this particular technology is its limited range capabilities. In a lot of the scenarios, the ability to be selective in what you pass

information to or to be able to indicate an intention in a very specific way are challenged when you are dealing with any kind of radio protocol that goes beyond a sphere of a few centimeters.

Has any one here tried to set up a Bluetooth connection? If you were to do it right now in this audience, it would probably take each person at least five minutes to get the list because they will find every single cell phone which has Discover turned on by default -- which, by the way, it shouldn't be -- when all you really wanted to do was find the headset, the wireless Bluetooth headset you just got sitting in my pocket or hand.

Wouldn't it be nice if instead I said I want to connect, and I put these two things together and my phone could just read from this, a tag, and the same kind of RFID type scenario that says I'm a headset and here's exactly how you can talk to me, and it connects instantly, rather than having to go around and look at the rest of the room.

If you look at a lot of the scenarios that you have seen described earlier in previous talks and certainly many of the ones this afternoon, there are a number of them that would probably be simplified and certainly made more cost-effective if you were to use a

short-range wireless technology.

The example of a custom phone for glucose testing, that makes the cost of that phone remarkably high and it puts extreme limitations on the types of phones that particular person is allowed to buy.

What if instead you still had your glucose reader, they still go through a little process, but like with the Saturn RFID sensor thing, I have my regular phone that has the reader in it and it simply reads the information from the glucose reader.

That gives me the freedom as the consumer to get whatever device I want that's so enabled but at the same time take full advantages of the nifty little way of reading things.

One of the biggest challenges to this wonderful world I'm describing is interoperability. I have heard a few people discuss that.

The last point I want to make is that this is an area that Microsoft is investing in heavily to some extent in the traditional RFID trace and track type of scenarios but specifically in the NFC scenario, because we see great opportunity for the kind of simple pairing with Bluetooth, or simple payment systems, where, again, that close contact is really important.

I don't want that turnstile to read my card, I

need this turnstile to read my card. Or I don't want the payment system to read me just because I walk within two feet of it. I want there to be a lot more intention, a more directed approach.

For all that to work, it means I have to have a Motorola phone or a Nokia phone or a device from some other manufacturer that can read and write to all of the same things that somebody else can.

So there's a group called the NFC Forum which is currently working to standardize the basic exchange layer as well as the data exchange layer, much like we have with the Web today.

HDP simply works everywhere the same way. Lots of things you can send over it. Now that we trust HDP, we are starting to get more creative with how we use it.

I heard someone say that's the beauty of some of this stuff, is the more it gets out there -- actually, it was you -- the more it is out there, the more creative things we can do with it as long as my device can really read any tag or interact with any other similar device.

So none of these things changes any of the fundamental concerns that have been raised. All the privacy issues still remain, the company securities remain. They are very important to Microsoft.

We are interested in looking at these issues from the ground up and trying to invest in them, saying do you need to consider security, privacy what have you here, all the way up the application layer.

It doesn't really alter the landscape, but for me it is fascinating how a very almost trivial technology actually simplifies the user experience in a very broad number of scenarios. We think that is very exciting.

MR. MAXWELL: Let me draw another sort of -- just as I tried to offer before how difficult it is, there is another piece of this which is that one of the profound lessons of the Internet was the extraordinary power of interoperability, that anybody could put something up on the Web.

The Web is the most open, creative activity that we have ever known, billions and billions of pages of work created by people without any expectation of payment as well as billions of people putting up for corporate purposes. But all because we had a set of open standards by which people could interact.

And while there have been I think over the last 10 years real fights about proprietary standards -- I won't say who has been on which side and what -- this notion I think has really affected everybody in the

space, everybody who is thinking about it, IP.

And the drive to make things more interoperable is a drive to allow more and more people to create, to offer their ideas, to find solutions.

There is maybe a third law. The third law is something I wanted to address and what Josh said earlier about things will get smarter but not necessarily cheaper. Things will get smarter, cheaper. The rule is there is nothing binary left.

People will find the technology that applies to the purpose, because the technology is so malleable.

So there will be cheap solutions, there will be expensive solutions, smart solutions, dumb solutions, but there will be this very large range of solutions that will be interoperable. That is a terrifically exciting opportunity.

MR. TURNER: I completely agree with what you just said. We have the XBox and so on. It is important for us that solutions be generalized in a way that we can leverage across our whole suite of products and services and so on.

If you take a look at something like an identity token, whether it is a credit card payment token, it doesn't matter. What matters to us is that can be exchanged from any device running any one of our

applications or services with any other device and with any other server supporting the same protocols and data formats.

When looking at how to do NFC with payment, to us it is not how you bind NFC and payment in a locked way. It is how do I leverage the payment token that's going to be used in a variety of ways and bind it to use when NFC is the transport, as opposed to when over the phone is the transport versus some other situation.

So the interop is at the transport layer but also at the data layer.

MR. MAXWELL: Imagine someone once described to me an intensive care unit. It had 15 different monitors, all spewing out data.

Now, what was interesting about this is none of this data was interoperable. So in fact, the surgeon or the person monitoring the ICU has to reformat the data to make use of it.

What that tells us is the power of interoperability in the standard formation where interoperability has enormous social content, social power.

MR. SMITH: I think one other interesting dimension in thinking about interoperability, there is also something to do with stability protocol. If you

look at IP, there is IP Forward, the thing that everyone uses. IP6 hasn't really happened. That may be important too.

A standard doesn't necessarily have to be good as long as its exists and was stable. Once you know how it works, you can use it and subvert it to do other kinds of strange things.

I wonder with RFID there are new protocols coming on now. It would be interesting to see whether they take off. It is a balance because by redesigning you can add a lot of capability.

It is not a standard because there are multiples competing. That is another interesting aspect of interoperability. There is a stability.

MR. MAXWELL: Openness is a spectrum. That spectrum involves judgment.

One couldn't build a code if the code could be changed every nanosecond when somebody had a better idea because no one would be able to use it.

They place these things on a spectrum. But in the RFID space, I think in particular, you have some fundamental pieces of a standard that are being built.

The question would be how can we do it so we can extend these capabilities and still have the stability that you talked about. It gets to be very important.

It is important to health care and important in the entertainment world where the real key is how many players I have for this, how many devices can use this and if it is limited in a very small number, people will say that's not going to be commonly successful.

MS. HUGHES: When you think about I'm always losing my remote for the TV, I'm out of luck.

MR. TURNER: That's my example of an NFC device. You read the tag off your TV, DVD player, your XBox player and it's done. None of these three-digit code thingies and hope the company hasn't gone out of business and lost their Web site.

MR. TERSTEGGE: You already saw in the video, and I will get to show it through my presentation as well, people can wear an RFID token like a bracelet or whatever and then use their own hands, their gestures to operate devices. So their own body becomes a remote control.

MR. MOSKOWITZ: I find the discussions about the future very interesting because I find as a technologist I'm much better at predicting the past than the future.

In fact, when most people do predict the future, they are extrapolating the past. I served on a Bluetooth committee representing my company. I believe strongly in standards because this is what makes stuff

work.

One day a friend of mine at work bought a new car, and he said look at this, takes out his cell phone, throws it on the back seat, the car communicates with the cell phone, and the cell phone makes a call.

That was the committee I was on five years ago working on a standard. It would not have worked without that standard.

Here I am, the technologist who helped make that standard, surprised to see it in action. That's part 1.

Part 2 is we don't know where we are going to go with these things once we implement them. I have my own Bluetooth phone. I was surprised to find -- I read the newspapers -- it comes with a camera. I start taking pictures.

The next question is how do I get the pictures out of my camera into my computer? Well, the phone has Bluetooth and my computer has Bluetooth, and with five minutes of work, I'm able to make my phone communicate with my PC. Who would have thought the major use of a cell phone is to take pictures and put them in my PC I would not have predicted.

MR. MAXWELL: Okay. Sandy Hughes from PMG.

MS. HUGHES: Speaking of standards, I think this is a good place to talk about our retail supply chain.

Beam me up, Scottie.

EPC is an application of RFID. Within the supply chain, we have found numerous inefficiencies where we could take advantage of this technology, the least of which is not the out of stocks or lost sales that we get from not having the product on the shelf when the consumers want it.

Studies have shown that when consumers cannot find the product that they want, 37 percent of the time they will buy something else and 21 percent of the time they will go somewhere else and get that. For manufacturers like ourselves, this is not a good thing.

So EPC allows us to transform the supply network and it becomes a crystal ball to us so that we can see product through the supply chain at every touch point where it flows.

For that, we get these benefits of less loss, less inaccuracies and the product where it needs to be.

EPC Global is a standards organization that enables this network to happen. We have over 800 businesses within this network, which is really important to set the standards so that we can all work together and get the product where it needs to be.

EPC Global is the child of the people who have brought you the bar code. So sometimes we hear it

called the electronic bar code. That's the application we are looking at here.

Skip that one. This is just an example of how it works within supply chain for some of the pilots we have worked on.

The cases up in the left have come to us with blank tags put on them. We figure out which item it is that's going to be going into those cases, put that into our computer system and then write onto the tag in the packing system where these cases are going through, the item number, the manufacturing plant where it is being packed and then the serial numbers that we get from EPC Global for the range of products within that batch.

Those then are aggregated into a pallet. In this case it is Venus disposable razors. It goes to the distribution center, which then within the distribution center, you can see the readers, the white boxes with the blue dots, and each one of these will read it into the distribution center.

We take that apart, perhaps combine it with some shaving cream, based on the customer order, ship it off to the customer.

They read that into their shipping center in the distribution center. They may take it apart again depending on which retail store it is going to, combine

it with some Kimberly Clark product or Johnson & Johnson product, send it off to a retail store.

And then as they take the product out of the cases to put onto the shop floor, they throw the case away, which then logs that as the end of the supply chain for EPC.

All of that, the reason I'm telling you is because you often hear about the tag and the reader when you hear about RFID. It is the whole network of integrated applications and databases that is the real power behind all this.

How do we know that Procter & Gamble gets our data from the retailers, somehow that has to get sorted out and go to the right applications.

When people talk about this great big database in the sky, that is a huge box if that's going to happen. I can tell you it doesn't, it can't.

We have done a number of different pilots. We have found where we get a lot of benefit right now, 35 percent of the time -- when we are doing a promotion, lots of advertising on TV print ads, 35 percent of the time the display cases that we have that go with that ad are not there where they need to be in those retail stores.

When we did a test with EPC, we found we get 19

percent higher throughput when we have the display cases where they need to be.

I will show you a real life example for that. This is our Mach 3 razors here and Duracell batteries. It is called a display case. We would put a tag on that case.

When it arrives in the store, it will be on the end aisle, sometimes within the aisle. In the supply chain, we can watch what happens to each one of those.

We tried this in production with our Gillette Fusion razor. Hopefully a lot of you men are using this, five-blade razors, really close shave. If you aren't, go try it.

We launched this product, which was really huge, with the Superbowl in 2006, and with that we tagged the display cases in over 400 stores and then we also had some control stores.

You can imagine all the excitement we pumped into people, where they are ready to run off to the stores and buy those Fusion razors and then not be able to find them.

Well, through this process we were able to track them through each one of those touch points, and there was an alert that came to us when every one of those cases got off track so we could make sure it got there.

Through that process, instead of the 60 to 80 percent average in our control stores, we had 92 percent compliance with those display cases being where they needed to be.

For those 400 stores it was a control test. You would say it was kind of fixed. When you compare that to our average, which is 40 to 60 percent of display cases, you can see the value, with the 92 percent being where they needed to be.

The reason I went into all this detail is because we didn't know two years ago that tracking display cases would be one of the benefits consumers would really get and where we could make it work as a business case throughout P&G.

So from 2004, this is kind of a cycle, we start with the technology. In 2005, the retailer mandates. So we have found the areas where it does work in 2006 and what we call the EPC advantage strategy.

So it doesn't have to be all or nothing. We can start with something and get started with that. We learn as we go, get benefits from it and then make changes for the next areas that we look at.

We have three different levels of product. We call it the E PC advantage ones. Also we have Crest White Strips and Gillette blades and razors, which are

some of the highest theft items today within the supply chain.

Being able to track that through, we get the product but it is also a savings. The testable products are the ones where we think there would be benefit. They are high-margin products but we haven't been able to scale that yet within P&G.

The challenging ones are where there are physics issues. That's just to show you how much the technology is changing and how much we are learning.

Of course, with what I have talked about are cases and pallets. We in the EPC network are focusing on most of that today.

Seeing the technology is developing so fast, the EPC public policy steering committee put together some guidelines so that as companies are starting to look at item-level technology, they can follow to make sure consumer protections are in place.

So all of the network members have agreed to follow these guidelines of consumer notice, which means that on the product or package there will be some type of notice, a tag is present, also that technology is in use, consumer choice, what's available today we have decided the tag would be on items where the package can be thrown away with the tag or the tag can be removed.

In the future, you don't get a lot of benefits if the tag is gone. We are looking for solutions as they become available.

That means you also have a need to have a lot of education on what does this all mean so that when people see the notice, they know what it means, what their choices are.

The other thing we agreed is as long as retailers are using the EPC tags and the information as they are bar codes today with confirmation of personal information, everything fits for those guidelines.

If they are going to do anything different, they need to go further with the notice and choice.

On that end, thinking about more than just the supply chain, because to the citizens of the world, RFID is RFID.

So P&G, together with a number of other sectors of the industry, pharmaceuticals, library, automotive, et cetera, got together under the center and some other consumer groups to come up with some best practices as the technology continues to develop and they basically follow the same elements that I mentioned before that are based on fair information practices.

So those same guidelines are the ones we have put out there for other companies to use for a number of

these different applications that you hear about, notice, choice, education, et cetera.

These are some examples of what we do within P&G. It is possible to implement some of these guidelines. Sometimes it is possible that a case of Bounty towels could get into the shop floor. So we tag everything.

We did it again with pharmaceuticals and even in our internal test sites. We have on our Web site more information about UPC, where we are using the technology.

I mentioned education is important. Benefits, you have heard a lot of these. So I will not go into that.

The key point I want to leave you with here is it's a phased approach. Adoption is progressing. You need to keep doing things when it works because only when we have the technology proliferate are we going to find more benefits for consumers and there is a way to build in public policy from the beginning.

Doing that as we are thinking of the different opportunities is going to be the right way to go in the end.

I'm going to stop there, and we have a video from Microsoft.

MR. MAXWELL: We are going to cut it because we are running over.

MS. HUGHES: Never mind.

MR. MAXWELL: Paul.

MR. MOSKOWITZ: By the way, Sandy, one thing you omitted to say, EPC stands for electronic product code.

MS. HUGHES: What did I say?

MR. MOSKOWITZ: I don't think you said what it stands for.

Sandy has elaborated very well on some of the benefits of tagging retail items with RFID tags. These are used in the electronic product code, EPC.

She has talked about guidelines which are very important. This is an industry which is thinking ahead to privacy concerns.

Today what we are doing is tagging pallets and cases. Tomorrow we will be tagging retail items.

This will come slowly. There are 100 billion cases a year worldwide. The number of retail items are about 2 trillion. There is no way today that the RFID industry can produce that number of tags. However, it will happen eventually. You can bet on it.

Although, as I said, I'm better at predicting the past than the future, I believe we will eventually see benefits derived from tagging individual items. For

instance, faster checkout. You can just push them all over a counter at once because you can read many RFID tags at a time.

There is a question besides the guidelines what can we do to protect consumers. It is important to us because if we lose the trust of the consumers, we have lost our technology.

The marketplace is the final arbiter in deciding what is used eventually.

So in addition to guidelines, there are various physical means that can be used to protect privacy. It is an issue with retail items because RFID tags can be read at a distance up to, say, 30 feet for a passive RFID tag, and they can be read by radio waves, not light beams, so you can have your tagged items read without your knowledge from up to 30 feet.

Some of the proposals for privacy, first of all, the kill command, EPC Global has built a kill command into the protocol for communication with UHF tags. This totally stops a tag from working after the point of sale.

It has one major drawback. You would like to have the tag working after the point of sale so you could use it for returning items, for authenticating items, pharmaceuticals especially, or for recycling so

that we can recycle it properly.

There are other proposals. One of the earlier ones and most impressive are blocker tags. The inventor of the blocker tag is sitting right next to me, Ari Juels. He can talk about it.

These are tags that would interfere with the normal reading of RFID tags. There is a proposal for clipped tags. You can have metal-lined bags in which to put your purchases. This isn't very practical. Not everybody wants to carry around a metal-lined shopping bag to stop the radio waves, and some items just won't fit in your shopping bag.

However, this is the method being used by the U.S. State Department for protecting RFID tags in passports from being read.

There are mechanical methods of stopping a tag from working. Bring your own hammer with you to the checkout counter. This also stops the tag from being used later.

And finally, there are various forms of encryption that can be used to help make the tag more secure. And there are many, many different proposals for encryption.

I would like to show you the clip tag. In fact, I brought one with me to demonstrate. What this is is a

tag which has notches at the edges and perforations which are very much like a ketchup packet. I will not open the ketchup packet here. I think I could make a good mess.

It would make a better comedy routine. So I won't do that.

We have a video on YouTube. Instead of publishing in physics letters, I publish on YouTube. It is not just for Lonely Girl in Borah anymore.

In any case, I have better ratings on my video than Lonely Girl, not as many viewers, though.

You have a tag which can be read at 30 feet. This is an apparel hang tag which might be attached to an item you purchase.

If I take the tag which has perforations and notches, I can tear off a piece of the tag, and now I have turned a tag that can be read at 30 feet to only be read at 2 inches. So the opportunities for compromised privacy are a lot less.

What it does is it allows the consumer to take the privacy into the consumer's own hands, his or her own hands.

It is a visual indication that the tag has been modified, unlike an electronic command where you don't know what is going on. This is a clear indication that

we have done something to the tag. In fact, we have ripped off a piece of the antenna. It's like when we used to have telescoping antennas on cars, if you lowered that antenna to go through the car wash, you can only receive the very strongest radio stations.

The same sort of thing. What we are doing is making the tag so it can only be read at 2 inches. In order to read the tag, it has to be held up right against the reader.

What this means is you can still use the tag as a receipt for returns or recalls or it can still contain that recycling information or it could be used for authentication, which is very important for pharmaceutical items. However, it can't be read at a distance.

The one bit of bragging is The Wall Street Journal liked this idea. In September they published their technology innovations for 2006 and included the clip tag on its list.

Finally, I have been asked to say just a few words about where the technology is going. I have a conceptual curve because you don't see any numbers or dates. But this is three stages in a cumulative adoption curve.

Pervasive devices are in the upper right-hand

corner. These are the pervasive applications of RFID today which we use often without questioning. EZ Pass is the electronic toll collection. I have such a tag. I used it this morning on the Tri-borough Bridge in New York City. I will use it this evening.

The New York City marathon tags runners shoes. I have an access badge from IBM which I use to get into the building.

Even my cats have RFID tags for identification and also to open their own cat door. Just like IBM, my cats have RFID.

These are pervasive applications.

However, look at EPC Global. We are working on pallets and cases. I estimate 100 billion cases worldwide. That's a big number.

The total tag production capability today is still only about 1 percent of that. So we are climbing the adoption curve for that.

For, as I show here, bananas or any other item, retail items that you would like to label, the numbers are staggering, 2 trillion items a year. We have nowhere near that production capability.

However, I believe we will start tagging items which are of high value or which are very important to us.

In the case of pharmaceuticals, the FDA has said you have to provide a means for authenticating the train of packaging pharmaceuticals from the manufacturer to the pharmacy because it is not a matter of money, it is a matter of human life. We have to make sure they are not intercepted and substituted with the fake ones along the way.

What I see, in conclusion, if this works -- there we go -- the pervasive applications, we have millions of tags. For the supply chain, we are talking about billions of tags. Eventually for individual items it is trillions.

But as time goes on, as the number of tags do get up into the billions, what you are doing is strengthening a standard, the EPC Global standard. It turns RFID into a commodity item so that the barrier to getting into this industry has been lowered.

You don't have to design your own tags and your own readers the way we did 10 years ago when we were just developing the technology. Even today you don't have to reengineer the whole system.

It is getting to the point where RFID technology will be like bar codes. It will be an off-the-shelf technology. You will see many, many new applications.

I hope they will sort out the aircraft baggage

issue so that my bags are at the same airport I arrive to at the same time.

I see that as the future of RFID.

Thank you.

(Applause.)

MS. HARRINGTON-MCBRIDE: Another terrific panel on RFID and its applications. I'm sorry to once again be the hook.

We are getting ready to think a little bit about convergence which is how we will end today's programming.

It was an extremely interesting panel, and the data will help us a lot in the work that we do. So thanks.

While we are switching gears, if you all want to participate, we have a polling question for you to help you think a little bit about convergence and how it might affect your life.

Which RFID application are you most looking forward to experiencing? A, features to improve shopping; B, tools to look after my elderly parents; C, interactive entertainment systems in my home; and D, I am going off the grid, I am not looking forward to any of them.

We will do the countdown and see what you all

think.

Oh. We have some nay sayers in the audience. All right. The people have spoken. And very shortly the people will be spoken to.

We have our convergence panelists being miked up right now and they will be right out.

(Break.)

MR. SIDAK: I'm Greg Sidak. I'm moderating the last panel today on convergence.

We are going to make a guaranteed effort to conclude on time at 5:30. To do that, I have asked the panelists all to be very succinct with their comments.

I will be the Jim Lehr to ask them to stay within two minutes.

To start, I would like to pose the following question and just start down the row here with quick reactions to the following.

What will convergence mean to us 10 years from now, in 2016? Since none of us is really a scientist type, we are all more policy people, what is the most important policy issue or set of policies issues we will be talking about ten years from now in connection with convergence?

Fritz?

MR. ATTAWAY: I think convergence will mean more

stuff. In my case, it will mean more movies and television shows available to consumers when they want it, wherever they want it and however they want to get it.

Convergence means we will be delivering movies and television shows through phone lines, over wireless phones, cable, satellite and God knows what other delivery systems.

It really is an exciting time for people in the content business because the doors are wide open for us to get our content to our consumers.

I think the biggest challenge that we face will be free ridership, people who somehow cheat the system and try to get it for free.

Just like Verizon, if a large number of people hack into Verizon and get their phone service free and soon to be television and movie services free, that creates a huge problem.

Everyone that has taken Economics 101 knows that free riders ultimately reduce supply and increase prices.

The free rider problem is our biggest challenge in this new world. I think we will overcome it, but it is going to take some effort.

MR. SIDAK: Taylor.

MR. REYNOLDS: To me, convergence in 10 years would be a state where I can subscribe to one Internet connection everywhere I go, rather than signing up for ADSL, mobile phone, Wi-Fi.

I can go to one provider that offers everything, and it will be ubiquitous connectivity wherever I go. I can be watching, for example, one of the movies on my mobile phone, move outside, move back inside, it pops up on my TV screen.

It is like IP connectivity that follows me around. That said, I think one of the biggest issues in the future is going to be competition.

Right now you might have competition from several mobile phone companies, but it is a good question to ask how many companies will be able to offer ubiquitous connectivity in the country, and I think competition is going to be one of the biggest issues.

MR. SIDAK: Jim.

MR. KOHLENBERGER: Thanks. Over the next decade, I think convergence means big, new things for consumers. It is a powerful, exciting thing happening out there.

Economist Magazine did a survey on convergence and found convergence of voice and data was the most powerful area of convergence over the next couple years.

When we say convergence, what is really happening is decoupling kind of the voice and video from the analog world and putting it on top of the Internet world.

These things become software applications and can be distributed anywhere, any time, and the innovation that was much constrained and that could only be upgraded over a decade's time can now be upgraded on Internet time.

In the next five years, I think there are things we are seeing in the voice and video world where competition from voice or IP services can mean $100 billion in savings for consumers through competition.

That's a phenomenal number. That's three times what video can mean. That's roughly on par with what the President's tax cuts are. That's a huge number for consumers, and that's a powerful thing.

It is really empowering consumers. For 100 years, we have answered our phones, and now they can answer to us. We can take charge, we can move them with us. We can have any phone number we choose, we can send it to any phone.

But the real exciting things are things that look nothing like a phone, click-to-dial Web pages, things where it is incorporated into the rating system,

into the office software where you can video stream and learn piano from thousands of miles away. We can learn a foreign language in different ways.

Convergence means these things we used to see as unique silos of voice and video and data have now become a thousand incredibly empowering things for consumers.

MR. SIDAK: Dan.

MR. BRENNER: I think with the Pacman image in your mind, if you will, remember Pacman would go one way and then the other.

In one direction are the competitors trying to reach different kinds of customers. Taylor described one kind of customer who wants ubiquity to follow them about. Others want very narrow purchases and nothing to do with this brave new Tech-ade world.

I think companies like Verizon and Google and Comcast and others will be trying to find the products that customers want from them at price levels and in packages that make it attractive.

Everything we have learned in the last five or seven years in the cable business is all about that. It's the stickiness of a package that meets a customer where they want to be.

Not every customer wants digital cable. Many want Internet, video and all of the YouTube benefits.

On the other side, I think the challenge will be to create sufficiently large enough markets, to go to Fritz' point, that can create a sufficient pool of money to create quality products, products that people want. Some of these products will be very cheap to provide.

So avoid using destructive technology that rapidly reduces the cost of the services that were just mentioned.

On the other hand, motion pictures, a big production, high cost of talent and sports and entertainment, I suggest you need a different kind of model to create products people want and want to buy in large quantities. And you have to find in this very customer-oriented market enough of a critical mass to create those kinds of goods.

MR. SIDAK: Sarah.

MS. DEUTSCH: I guess many of the examples people gave are really relying on broadband in many senses as the driver to get this engine of growth going forward.

Some of the evolution that we are seeing in our area are from wireline to wireless plus converged models of both, from narrowed band to broadband, from voicecentric to videocentric, from copper to optical infrastructure and from kind of a Web TV phone and a

passive delivery system to one where the user actually participates and creates the content.

It is really going to be a media revolution. Some of the challenges that I see would be ensuring that broadband can grow without unnecessary regulation to copyright issues, because there will always be a clash between new technologies and the protection of intellectual property, security and privacy, because the more ubiquitous all these services, the more opportunities for scams and things that would keep the FTC quite busy.

MS. SOHN: It seems 10 years ago nobody predicted where we would be today, that is, the development of a whole class of creators.

People are creating their own content. They are delivering it all over. If people read The Wall Street Journal today, Sarah's company entered into an agreement with YouTube to provide some of the videos on demand and also on their Vcast service.

I don't think there will be one convergence. I think there will be different convergences.

One of the questions we were asked and everybody on the panel gave a thumbs down to, will we have one device that will follow us around and do everything for us. I think the answer is absolutely no.

Like today, we will have many different devices that do different things well. You will have convergences of video and gaming and data and storage and also convergences of voice and video and voice and data.

I don't think there will be one convergence in particular. One thing I do agree with which I heard from a couple people is that the silo system that we know now, broadcasting, cable, landline, voice, voice over IP, those differentiations are really going to go away.

That's what convergence means to me. The pipe that delivers whatever it is you want delivered is not going to make a difference. I'm hoping the regulatory system will change along with it.

But for me and my organization, I would say there are several really important policy issues.

First and foremost is how to make copyright law, which was last seriously rewritten in 1976 -- that is preVCR -- how we make it conform to today's world where people are creating their own content, where mash-ups between two copyrighted works are some of the most popular content that's created, how we go from a you must license everything system, which is the system we have today, to one that allows for a little bit more

freedom of creativity, ensuring, of course, that copyright holders get adequately compensated, but reflecting the reality of how people use technology today.

The other issue that I think is very, very important is the issue of disclosure. And I want to talk about that in two different ways.

I think you are going to see more content providers, more the folks that Dan and Fritz represent, using digital rights management tools to try and protect their content from being stolen. My organization doesn't have a problem with that as long as it is something that happens in the marketplace, as opposed to being government mandated.

On the other hand, we do think consumers should know when a CD is copy protected. They should know what they can and cannot do with the technology and software that they buy. Right now they don't know.

Similarly, we have been involved in the whole Net-neutrality debate, whether a broadband provider should be required not to discriminate against those content applications and services in which they don't have a financial interest.

Even assuming there is no Net-neutrality requirement placed by Congress upon them, shouldn't

consumers know the quality of the Internet service that they are getting and whether Internet providers are indeed favoring certain content over others?

So those are just some of the policy issues that I think are going to be really important in the coming 10 years.

MR. SIDAK: As I hear the panelists discuss this, I guess I would summarize the issues as I have heard them this way. There are concerns about competition, about incentives for investment to create content, the trend by which end users become part of the creative class themselves, the importance of providing focused products and pricing policies, the concern that ubiquity and the sheer volume of choices that become available also magnify existing policy issues, such as security and intellectual property protection and disclosure issues.

One additional theme that I heard was the movement of applications to software away from the network. And that leads me to pose the following question. I invite any of you to jump in.

If traditional services like voice and video become over-the-top software applications, then are we moving from telecom-related intellectual property related policy debates to debates that look more like

the ones that we had with respect to Microsoft's integration of functionalities within an operating system? Is that what convergence might suggest in terms of policy issues?

MR. KOHLENBERGER: I think we are going to this world where all these things become software, and I think it means innovation is the key driver.

We need to protect innovation in order to bring the consumer benefits about. We can't automatically take these new types of ideas and put these into these old regulatory boxes and constrain the types of regulation that are happening.

The voice world, there are some really great things that are happening right now.

Darkware is working on software that can automatically translate English into other languages. When you couple that with voice, where we can talk to anybody around the globe, Star Trek, it is kind of like the universal translator out of Star Trek.

In hospitals today, people are using these Wi-Fi name badges where they are voice activated and you can call Nurse Cratchet, whether she is across the town or in town.

I think it means something fundamentally different. Any application, service or device can have

a voice or video component. When we get to that kind of world, we can have a whole proliferation of services that compete not necessarily head to head but in new and completely different ways, things we can't imagine today.

Those are the things we need to protect, make sure that innovation can thrive, that we don't put these things into these old-timers.

MR. ATTAWAY: When you think of software, don't forget that content, movies and television shows are software nowadays. They are bits.

We need to keep that in mind when we set international trade legislation and domestic policies.

Greg mentioned the need to protect intellectual property to spur creation of content. Yes, but also we need to protect the content from, again, free riders. I won't say "thief" because that's a derogatory term, but free riders in order not only to protect the content but to protect the delivery systems that deliver that content.

As Dan and Sarah will tell you, building cable facilities or telephone systems is very expensive. They have to pay for it, and the way they pay for it is by getting paid for the services that they provide.

MR. BRENNER: Just to open this up, Fritz and I

love to debate all kinds of issues. Let me challenge you for a second.

YouTube was sold for a very large number to Google, and yet those are to some degree free riders. There is a lot of content that is not copyrighted or if it is, it is not commercialized.

There is a lot of commercial stuff on there. Yet there has been very little effort to tell YouTube to take down clearly copyrighted entertainment product. Why do you think that is?

MS. SOHN: Certainly no lack of interest on our part. I think our member companies have made it very clear to YouTube that they expect this infringing content to be taken down. I think YouTube is going to do that.

A fair amount of stuff has been asked to be taken down. That kind of gets around nobody is going to condone the fact that people sometimes steal music videos and put them up on YouTube. That to me is not the problem.

The problem is a homemade video that was on YouTube of a 75-year-old guy who thought it would be cool to tell young people about the way he uses technology and the things he likes, and he puts on a CD player and plays his favorite song. If you ask somebody

in the recording industry, that is something that could be subject to a cease and desist letter. He played a song and it is a public performance.

In my mind, that doesn't make any sense. If the law needs to be changed, it shouldn't be changed to stop the wholesale I will use the word "theft" of somebody's intellectual property. But when you are talking about creativity, transforming a transformative piece that maybe does take two copyrighted works and mash them together or the incidental use of a song or video or movie in the background of user-generated content, that shouldn't be something that cost that person 10- or 20,000 or should be subject to a lawsuit.

MS. DEUTSCH: I think the --

MR. ATTAWAY: We have a fundamental disagreement there. The law is fine. What needs to change is the marketplace.

The marketplace is changing very quickly. We as content owners need to find marketplace ways to allow people to use our content in ways that they find easy and affordable.

Repealing the copyright law or enacting compulsory licenses, Dan will tell you how effective compulsory licenses are. It is just a bad idea.

MS. SOHN: Of course, I'm not advocating

repealing the copyright law.

MS. DEUTSCH: A 75-year-old guy rapping should probably be subject to a cease and desist letter. That shows we are going to be stranger than we already are, speaking to ourselves.

MR. BRENNER: By the time we are 75, that's going to look like middle age. It will be the new 55.

MR. REYNOLDS: If I can chime in here. One of the things interesting about intellectual property here, users don't know exactly how they can use this content that they buy. There needs to be some clarification that if I buy this music, if I buy this video, can I use it.

What is the definition of fair use? We need some sort of clarification on how we can use these things that we buy, if we can stick them on YouTube, what is a parody, what exactly is infringing use of something.

The same goes for we talk about content on the network. I think it is also important to look at the networks themselves. How can users use these networks? A lot of this is active disclosure.

MS. DEUTSCH: The YouTube 10 years ago would have been shut down. There was probably an open and shut case for copyright infringement.

This year people are looking at them more carefully. Content owners are probably thinking how can we make some money off this, how can we clean it up. Google has amassed a large war chest to try to settle a lot of copyright claims.

MR. SIDAK: We have talked about how these new products put stress on old regulatory paradigms.

But what about old business models? In a sense we are seeing a shifting toward revenue models that take advantage of the willingness of some other party to pay for the content that may be delivered to us, some more advertiser-based revenue model.

Is that something that will carry through all of these different areas of telecommunications and content and software?

MR. KOHLENBERGER: I think it is very exciting for consumers, because for a hundred years we paid monthly phone bills and cable bills for five. Now we have the opportunity to download free software that you can make phone calls and video calls around the world. That's a powerful thing.

We have ways people are rolling out services that are advertising bases.

We don't know if these things will work or not. Voice will eventually go for free. The one thing I

think that Fritz brought up and Sarah mentioned is these networks, they are expensive.

I think we have to keep in mind there are two sides to the broadband equation. Too often we look at the supply side and think that we have to invest money on the supply side to build these networks the make this all possible, where in fact there is a powerful demand driver.

Ten years ago I was fortunate enough to have this guy, college graduate student, a guy named Mark Andreson. He had this little diskette, something he gave me, the first version of the Mosaic browser. It brought text and graphics together.

Now we have made those graphics move, now they are interactive. Now we have done powerful things. At that time, people said this Internet cannot handle pictures, it is not big enough to handle these things, and we can't have this browser thing on the Internet.

The Internet started at least at one point it doubled traffic in a hundred-day period. Traffic on the Internet was doubled. That became the demand driver.

People demanded more out of this Internet, and the pipes were built. We ended up with a glut of fiber in the 2000 time frame. It was a phenomenal story.

We can't forget the lessons that as these things

go to zero, they create a demand, more value for consumers in that broadband pipe and makes it more valuable for consumers to buy and pay for the service.

MS. SOHN: What Jim said raises a couple different issues for me. I don't know how much has been discussed over the past few days, but there's the need to ensure more universal adoption.

We all have our Mach 10 service. There is a good 20 percent of the country that doesn't even have access to broadband because they are in rural areas and poor folks.

MS. DEUTSCH: 20 percent?

MS. SOHN: These are FCC's numbers.

MS. DEUTSCH: In some unserved areas.

MR. KOHLENBERGER: It is true that about a third of folks don't have any kind of Internet.

MS. SOHN: Even if it is half of what the FCC says, that is still a significant amount of the population that doesn't have access to broadband.

It seems to me there hasn't been a whole lot of discussion about that among policy makers in quite some time.

MR. BRENNER: Tens of hundreds of millions of dollars are given away to underserved areas. I think policy makers have worked on that. It is not the FCC's

province to allocate those funds. But other parts of the government do.

I think everybody agrees broadband should reach rural areas. It is rural areas where cable and DSL or rebuilds of the phone systems don't reach.

I think that is an issue of government making the decision to subsidize and to assist those that are serving those areas as long as a real commercial competitor or a WIS isn't already providing it.

They shouldn't subsidize. It would be great if there were two, three, four. But my tax dollars shouldn't go to the fourth or fifth provider.

MR. REYNOLDS: If I can jump in there, giving kind of an international perspective. One of the things we do at the OECD is we make comparisons in broadband across countries.

The U.S. has chosen a certain type of regulatory path. They have decided there is not going to be a local loop on bundling. That was mandated with the 1996 Communications Act.

That requirement was partially pulled back. That means you have less competition on, for example, a DSL line where, as I live in France, I live in Paris, I can choose among six or seven broadband providers over my telephone or I can choose to go with the cable

provider.

That said, there is a possibility in the United States that you have competition between cable and DSL, whereas, a lot of countries in Europe don't have a cable network that can serve Internet access.

MS. DEUTSCH: It is not just cable and DSL. We have 3G and Wi-Fi and power line all coming. The market is getting more competitive.

MR. REYNOLDS: I would be careful. One of the things we take care to do at the OECD is define the market.

We can't put Verizon's FiOS product which is capable of 30 to 50 megabits per second with their CDMEDVO product that is probably good up to one megabit per second.

We need to be careful. There is competition in the United States. You do have this intermodal competition between DSL and cable. One thing that has worked in other countries has been this competition on the same line through local loop unbundling. It certainly works in France where I am as well.

MS. SOHN: I wouldn't overstate the competition. Again, the FCC's own numbers show that in 30 percent of the country, you either had a choice of cable or DSL.

Only about half the zip codes in this country

have a choice between two. So we have advocated some sort of nondiscrimination Net-neutrality principle. Local loop unbundling would be fine.

We hear about competition coming, broadband over power lines, which is about 1 percent of the country, but they are not really competing. Even Verizons EDVO has a lot of restrictions on what you can do, peer to peer, certain downloading because of the technology.

For real high-speed broadband, you really only have a choice of two. Again, that is only a choice that 50 percent of the country has.

We think until there is real competition, you need some sort of openness. Maybe it is not Net neutrality. Maybe it is some sort of infrastructure openness. Maybe it is something else.

MR. SIDAK: What about the possibility of relying more on antitrust standards that are general applicability?

We discussed a minute ago about getting away from this silo model of regulation that the FCC has used for decades. The European Union, for example, at least in name it has more of a competition-based framework for looking at telecommunications markets.

Is that something that might be different 10 years from now when we are talking about convergence?

Would we basically be talking in terms of the language and tools of antitrust lawyers?

MR. BRENNER: I think it is more attractive to deal with problems as they arise. One of the things in this whole network-neutrality debate and just how will broadband develop in the U.S. is an absence of specific problems that we want to address.

We have the one example that the FCC dealt with very quickly. Since then, there has been virtually no behavior.

It would be healthy to see a range of experiments, a range of offers being made, including speeding up service. If Bell South wants to speed up service to an HD provider on broadband and provide managed service so that entity could offer a competing product competing with an HD via a telephone-based broadband product, that would be an interesting thing to see.

There may be behavior that goes too far. Blocking we know at this point for major providers is off limits.

MR. KOHLENBERGER: This is a Global market --

MR. BRENNER: Let me finish this thought. The advantage antitrust, despite the problems it had in working through the Microsoft problems, because it took

a long time and a lot of energy for results some people felt were ambiguous at the end, at least you have a set of facts you can identify as the problems.

Here the debate in Washington seems to swirl about things that haven't happened, aren't happening.

MR. REYNOLDS: If I can address this. There is something that has happened in the past month in Korea. We are following this debate across the world.

MR. BRENNER: Yes, we know. But after the explosion, what?

MR. REYNOLDS: In Korea, the second largest provider is Honalu. KT is the telephone company. Honalu offers fiber to the home to people.

But there are 3 million of its subscribers to its Hona TV that are blocked from accessing services over cable networks. You would think it is a video on demand product that they offer to anyone, to anyone. It doesn't have to be a Honalu subscriber.

You say why don't they just switch it on? The problem is something that the FTC might have to address in the future, and that is Koreans are locked into three-year contracts. They have no way of getting out of this with their cable company for three years in order to get the cheap prices.

Then all of a sudden their video doesn't work

anymore from Hona TV.

MR. KOHLENBERGER: In Korea, in three days, remember those nuclear missiles took off. In South Korea, U.S. Armed Forces, who had taken their voice OIP services with them so they could cheaply call home and video conference home and family events, the broadband provider was going to block them.

The base commander had to get involved and he temporarily had to get a reprieve so they are not blocking that.

These things are happening around the world. In Chile just two weeks ago, on antitrust grounds they got involved to try to prevent the voice or IP service from being blocked. In Belize, businessmen couldn't call home on their voice OIP service.

In each of these cases, policy makers have got involved to make sure there could be competition, that there could be choices.

At least where I grew up, I don't wait for the rain to come before I go out to fix the roof.

MR. BRENNER: Didn't the Secretary of State say something like that?

MR. SIDAK: We are down to our last minute. I will give Fritz the last word.

MS. SOHN: I would like to move from Korea to

France. The French were mad at Apple for not making their service interoperable with other devices.

So instead of exercising their antitrust law, their competition laws, they attacked the technology. They said that if you use DRM technology and someone else wants to make it interoperable with their device, you have to divulge all your secrets.

Well, of course, that would be the end of the DRM.

It really is something that governments should consider. If you are concerned about anticompetitive actions with respect to interoperability, don't attack the technology; exercise your communications laws. And the sign says time is up.

MS. SOHN: I have a better solution. I agree with Fritz, the French law was a bad --

MR. SIDAK: We have to go.

MS. SOHN: The better solution would be to have a fair use exemption to the Visual Millennium Copyright Act which would allow you to circumvent whatever DRM is on whatever digital media for lawful uses.

That would allow you to make your music interoperable with whatever device you want to play.

MR. SIDAK: Thank you. That concludes our panel. Thank you very much.

(Applause.)

(Whereupon, at 5:30 p.m., the hearing was recessed.)

C E R T I F I C A T I O N O F R E P O R T E R.

DOCKET/FILE NUMBER: P064101
CASE TITLE: PROTECTING CONSUMERS IN THE NEXT TECH-ADE
HEARING DATE: NOVEMBER 7, 2006

I HEREBY CERTIFY that the transcript contained herein is a full and accurate transcript of the notes taken by me at the hearing on the above cause before the FEDERAL TRADE COMMISSION to the best of my knowledge and belief.

DATED: NOVEMBER 20, 2006

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BRENDA SMONSKEY

C E R T I F I C A T I O N O F P R O O F R E A D E R

I HEREBY CERTIFY that I proofread the transcript for accuracy in spelling, hyphenation, punctuation and format.

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DIANE QUADE