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GOOGLE IN EUROPE: INNOVATIONS FOR A DIGITAL FUTURE

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- ES GILT DAS GESPROCHENE WORT -

Das Forum Constitutionis Europae ist eine gemeinsame Veranstaltung des Walter Hallstein-Instituts und der Robert Bosch Stiftung.

I think of this as the oldest and most renowned university in Berlin. I can think of no better place to talk about the kinds of things that we want to talk about in Germany and Berlin than what we're doing right now.

It's interesting if you think about Germany, think of Germany as an innovation center, maybe one of the great innovation centers of the world. You have more patents than anybody else. Think about the German success, the German miracle that exists today. The fact that you're powering much of Europe and much of the world recovery, and in particular much of the growth of Asia and so forth is coming from German engineering and German manufacturing. So we have a long history of innovation, of accomplishment, and of success that all of you can be very proud of. And I think most interesting is that as college graduates, graduate students, and researchers, as best I can tell, you have the highest probability of getting a good job of anywhere around in the world because of the success of the country around you, which I think is a testament to everyone here.

I wanted to start with a couple of announcements. And I think the first is that, Google, of course, is doing very well and we're going to add more than a thousand people in Europe this year. Including hundreds of people in our Hamburg sales office and our Munich engineering center, and some of the programs I'm going to talk about here in Berlin. So we are investing big time, if you will. We intend to make sure that we reflect the culture and the heritage and the accomplishments of Europe and, in particular, of Germany. And we want to invest here, which I'm very happy to say is important.

Another thing that we're doing is actually announcing the creation of a whole Internet and society research arm. Today, we're announcing an internet and research institute. In spending some time thinking about Germany, the German culture, German academic culture, you have a long history of academic debate. And that history is pretty fundamental to the way your society has worked pretty well. We want to participate in that. We want to actually fund the center, literally to the tune of millions of euros, to discuss and debate the evolution of the web, the Internet, public society, public debate and so forth. And I think that will make the web stronger. I think it will make the German understanding of what's happening stronger and I think it will make Google stronger by being a participant along with all of the other Internet companies.

And then the third thing we're going to do is we're going to announce a 10,000-small-business initiative to try to make sure that small businesses here in Germany can take advantage of the

Internet. I like that idea because we all understand that the job-creation engine is ultimately small businesses. And it's still the case that many small businesses are not fully using the Internet for eCommerce and things like that. We have a program that we're rolling out here in Germany to do precisely that.

And then – perhaps the most important thing I wanted to talk about – is an announcement of a product called One Pass. We have been worried as many people have been that it's been very difficult to monetize, to sell, to make money from newspapers. What's happened, of course, is the Internet has come along, the Internet is perceived as free and people who are working very hard to produce very high quality have not been able to get paid properly. We've tried various approaches to, advertising and so forth. And they don't completely work. They certainly don't work well enough to provide a robust infrastructure, if you will, for comment, for research, especially for investigative research.

This is not a problem in Germany alone. This is a problem everywhere in the world. It's a problem in the United States. It's a problem all throughout Europe. It's a problem in Asia. And so, Google developed a product which we call One Pass. It's actually a technology that allows the publisher to decide to charge or give things away for free. If you want to give things for free, that's great. If you want to charge for the information, you can charge for it on a one-time basis or on a subscription basis. Now you say, "Well, wouldn't it be great that everything be free?" Well, of course, I love free too. But the fact of the matter is: there are things which are very much worth paying for and we've learned that people will pay for them for the same reasons that they'll pay for newspapers and magazines and so forth. And so we built a system that we're in fact launching here globally from Germany, here in Berlin for the first time, that allows you to do this for all of the content that we care about; that literally, anything that people would like to charge for, give it a go. Give it a try.

And what's interesting is it works with existing print publications. So if you already have a newspaper you can add this to your newspaper subscription approach and everything works. And more important, the publisher is the merchant of record. We don't keep that information. We don't prevent you from knowing, if you're a publisher, who your customers are, like some other people.

So, all of a sudden, right, we've got a very different approach, a very publisher-friendly approach, and we basically don't make any money on this. We do it as a cost basis. We make our money on advertising, of course, so don't worry about us. The most important thing is to get money to the people who are producing the high-quality content because the high-quality content is what you're going to the web and what you're going to your mobile devices for in the first place.

What I'm particularly pleased about is to say that there are three significant publishers here in Germany who are participating and, in fact, announcing this with me. They are Axel Springer, Focus, and Stern – some of the major magazines and newspapers here and publishers in all of

Germany and for the global – in fact, the European – world. So thank you so much the three of you for helping us work so hard to do it. And they're right here in front of me, so thank you.

So with that as sort of an opening, I wanted to spend a few minutes to talk a little bit about the future and then take your comments or questions. And I'd like to start with the observation that people are confused about the Internet. They somehow think that something bad is happening when, in fact, I think something extraordinarily good is happening. And when I look back at what has happened in the last decade, the tremendous number of this and that and all of the inventions, I see a very, very good set of accomplishments, and I'm very proud of having been part of Google during that period. And again, looking forward in the next decade of mine at Google, it's going to happen even faster. Even more things are going to be happening because of the scale and the platforms that we have now articulated. And what's interesting is people are beginning to understand the pervasiveness of this.

Here's an example. This is a quote from Joseph Scarborough who's a columnist. He talks about a world where computers offer a cold substitute to human contact. He's a negative, negative writer on this: "The technology is winning the battle against actual human contact." And of course, he writes very well and I think he's completely wrong. In fact, I think the structure of computers is going to allow us to spend more time with each other and do more of the things that we care about for precisely the reasons that I'm going articulate for you. That we'll be able to spend more time with the people that we care about to explore new places and to have sort of make the world a better place. The technology exists to serve us and not the other way around.

So there are many, many examples of this. A most recent example, everybody knows that in the last few weeks, there has been an extraordinary revolution in Egypt. And during the revolution, the government did something that was unprecedented. They tried to turn off the Internet. Big mistake. Don't do that. And many, many people complained. One of the things that we, at Google, did was working with a number of our friends including Twitter. We put together a Speak-to-Tweet program. So that if you couldn't get on the Internet, you could call on the phone and you could say what you wanted tweeted and we would tweet it out for the whole world to hear. Okay? Simple, easy to do. What's interesting about this is this is not some idea that the senior executives at Google had. People just did it. It was just their idea. They just said, "Let's try this." And it's an example of the power of our culture and the power of freedom and the power to be heard is so pervasive. What's interesting, by the way, is that that particular tool was built by two engineers in one weekend. That's power. That's impact. And of course, everybody knows what's going on now. Hopefully, it will transition to a much better and more peaceful lifestyle for all Egyptians.

What's interesting about transparency, and Europeans understand this particularly well , is that the European Union has made millions of documents available to the public through something called the Open Data Network. And again, you can now search and try to understand what they're up to. And if you don't like it, you can criticize them and furthermore, you can see if they tend to respond to your criticism or not, right? But transparency gives you that power as a citizen. It's very fundamental to how democracy, at least in our view, works.

Another example. This is another very interesting trend. There's a company called Ushahidi. It's a website and they started off monitoring things going on in the Kenyan elections. It's 2008. Very, very clever people. And what they do is they track what happens and they crowdsource the results. So they don't rely on what they see, they ask everyone; "You tell us what's happening over here, what's happening over here, what's happening over here." This principle of crowdsourcing gives us another way of seeing what's happening in the world that we could never do before: real time modern reporting. So we did this in a different context in the 2010 Haitian earthquake: a terrible, terrible thing. And using crowdsourcing information, we could figure out where people were hurt, where people were in trouble, how to get them to the right medical care very, very quickly. It's being done right now with the famous actor, George Clooney, in a project in South Sudan where the Sudanese government has said the following things are true. And by virtue of using satellite monitoring and crowdsourcing information from people on the ground, you'd be amazed that perhaps what the government is saying is not exactly what they're doing with their military troops. What a shock, right?

So again, the transparency, the power of the Internet and what you can do really does change everything.

I'll give you another example. One of my favorite examples. One of our engineers is color blind. So he wrote over a week an application which, using Android, changed the colors so that if you're color blind, you can see the colors the way you're supposed to see them by looking through the camera, right? A very, very simple idea, but one which makes life infinitely better for everybody who cares about that or needs that.

So what is happening here? Why is this happening so fast? I guess this is one of the questions. It's because everything is happening faster now. The growth of the mobile web, mobility and the things we're talking about is occurring eight times faster than the same growth that occurred in the early '90s on the original web. So not only is it bigger, it's also faster. Interesting. A few months ago, I did a calculation and predicted that smartphones would surpass PC sales within two years. I was so wrong: Smartphones surpassed PC sales last week. So much for me. It's happening faster and faster and faster. Now why is this? Because

the utility is so great and there are many, many examples. The smartphone shipments grew in the fourth quarter of 2010, 89% year over year. And here in Europe you were the most mature smartphone markets. The Europeans are always ahead of everybody else – always ahead of the curve. And smartphones continue to do so.

What's interesting now is that for many, many people in the world, smartphones are the only way to get online. An interesting statistic is that for more than half of African and South Asian subscribers, the only way to get to the internet is on their smartphones. And so imagine you're a person who lives in a relatively poor village, you're very intelligent, but you don't have a lot of information, you don't have textbooks and so forth: How important is your phone? You think your phone is pretty important now, imagine how important your phone is to them on a 24-hour basis everyday.
What's interesting now, of course, is that everything is connected. So when you see a music device, if the music device is not connected to the web, not very useful, because all your music is on the web as well as on your sort of device. Take every device you have and imagine connecting it to something; connected to the web, connected to Wi-Fi on and on. That's all happening in the next few years. And all of these things are occurring because of the pervasive data connectivity that we're all experiencing.

There's a standard called LTE. LTE, again, quite a bit developed here in Germany. Germany is the leader in LTE deployment. Many people within Germany have access to 50 megabits or higher, so I'm very, very jealous. You're seeing this in other countries. Australia, a country which has always been far away, has decided that 93% of the people in the country by 2018 should have a hundred megabits or greater. It's become a public policy under the new prime minister. The other 7% will have to make do with 50 megabits. The European data initiative, the European leaders that you have in Brussels have announced that it is a right, or a goal, or whatever you want to do it, that by 2020 at least half of Europeans will have access to 100 megabits or greater in terms of connectivity.
At 100 megabits, the distinctions between television and radio and HD television and all those things, they all go away. It all just becomes content on the same pipe or whether it's your tablet, your mobile phone, your television or whatever. So in one generation, all of the distinctions, all the differences that we've grown up with go away because of the pervasive nature of this technology. What's interesting is that 98% of all the world's mobile providers now offer at least one megabit. So I give you statistic after statistic to say that this is a phenomenon that touches all humans: not just Germans, not just Americans, not just Europeans, not just Asians. And it has a lot of implications. One of the things that I'm most interested is what will all these people do when they get online? Will they behave the same as we do, or will they behave in some different way? I don't know.

Now what's interesting about this phenomenon is that you have the phone phenomenon, which I've already talked about, and you have the network phenomenon, and you have one more; you have cloud computing.

And cloud computing is the term that's used for these large server farms, of which Google has many, and these servers are used to do interesting things. So, typical example: When I was last here in Berlin in September, we actually showed for the first time, I believe, in history phone-to-phone translation from English to German to English.
And we had Kay who's over there talking in German to his friend – in English – and they were trying to buy shoes. And one would speak in English into the phone and then the answer would come out in German, and the German would speak in German and the answer would come out in English. And it was good enough. Now you sit there and you go, "Okay, that's pretty good. How did they do that?" The language is translated into bits, the bits are shipped over the network, the computers translate the bits into, essentially, text. The text is translated from one language to another, and then the text from the other language is turned into a voice synthesizer
and comes out as German all in a hundredth of a second. But most importantly, it will eventually work for 100 hundred languages by 100 hundred languages. So it will be possible to literally speak to pretty much anybody in the world. You may have to wait for them to finish and not interrupt them because the translation takes a tenth of a second. But the fact of the matter is we dreamed of this and now this technology is possible.

Another example. Today, in Android, you can say, "How do I get to Museum Island?" And it would say right back, you know, in German. It would translate it for you and then you could play that to the local policeman who's busy asking you why you're lost, which happens to me. Or you could take your menu and sort of point your phone at the menu, in German. And it will translate it into English if you're me and you don't speak good enough German to actually understand what the menu is all about and discover that you're ordering a calf's liver, you know, or something exciting.

There are a lots and lots and lots of examples, other examples. Were digitizing the 2,000 year-old Dead Sea Scrolls so that you could see them without having to go visit the Dead Sea. When I go to my laptop, I can visit the Ruins of Pompeii. I mean, on and on, and on, I can go. We have historical imagery from Berlin from roughly 1945 on. If you take your satellite photo, you can actually dial back in time to see the recovery and rebuilding of your beautiful city and see what it was like over and over again and on your mobile phone. Pretty interesting.

This concept that I'm talking about is not a new concept. Bill Gates talked about it in 1990. He said that, "Information is at your fingertips, all of the information that somebody might be interested in including information that they can't even get to today." Why did it take all of us 21 years to get to this point? We've been working on it a long time. Well, partly, we needed the underlying networks to get faster. We needed the chips to get faster. We needed the software architecture to get faster, and we needed the markets to develop, and I want to highlight that for a minute.

How does Google play into this? Speaking on behalf of Google, well, in many ways, a new definition of Google for you is that Google uses technology to try to do good things for the world and that we're trying to apply this to make the world a better place and we make money along the way, of course. And when I think about it, the most important thing that you have is time. And as you get older, you appreciate this even more.
Time is everything. And so we focus a lot on getting your time back. What we want to do is get you the answer fast, get you to where you want to go fast. We don't want you to spend a lot of time on Google; we want to get you to somewhere else and come back, and back, and back to do it. So in Search, for example, we want you to get you the questions and answers that you care about right now. Well, what's an example? There are plenty of examples. We did this thing called Instant Search where we saved a couple of seconds on people search. You know, we showed you the answers as you were typing. We rolled that out globally in the last few months. All of a sudden, a couple of seconds times a billion people is an awful lot time saved so people can do other things and maybe they'll just do more searches.

But what they hope we'll do is they'll also find better answers and learn more about the world. Another example: We can make search more personal. Now this is with your permission, and I say with your permission and I really mean it. If you authorize us, we can search maybe your history, maybe where you are, maybe, with your permission, you'll let us let you know who your friends are. Maybe we can search your email as well and show you the sum of the answers that you care about in a way that you'll never be able to do on your own. Pretty interesting. Even better. We call this autonomous search. Your phone, by the way, knows where you are.
Here I am in Berlin. I like history, all right. I'm walking down the street. Why is the phone not working for me? It's not doing anything else, it's just sitting there. So, why don't we instead have the phone go and tell me what the history of each of the buildings is as I'm walking by, or the equivalent thing that I care about since it knows a little bit about me? There, the search is not just the text but really the place. And if it knows what I care about and it knows where I am, it could be generating things that I might be interested in. Pretty interesting idea. So, all of a sudden, search becomes autonomous, personal and very powerful. I mean, in my case, I happen to like planes and so, it turns out that you have literally a museum down the street

here that has a particularly interesting jet called the Hansa Jet which I was interested in learning about, and a particular Starfighter that's on display, right? So, these are the sorts of things that I care about. You would care about something else.

Search is also moving from understanding text to meaning. So, when you say, for example, "What's the weather like?" Do you mean, "Should I wear a raincoat?" Or are you saying, "Should I water the plants?" So, all of a sudden, you have two choices and we can help disambiguate that.

Now, in the mobile area, which I highlighted a lot, the scale of mobile is so large that it's hard to describe how much is going to happen over the next year. If I reused setting out on what I was doing, I would focus on mobile first because mobile is where all the new applications will be. It's where all the new and interesting applications, solutions and creativity will be applied, in mobile of one kind or another. So, for example, Android, which is our version of the operating system freely available to operators, sells or is activated more than 300,000 times per day. Again, that number is growing very rapidly and we have roughly 27 OEMs, 170 compatible devices today, 169 carriers and 96 countries. The number of searches from Android searches in our world grew by a factor of 10 in the last year. And we give the operating system away and, of course, the way we make money is through advertising. And so, trust me, it's a good business deal for us to do this. But from your perspective, having that broad platform enables you to build applications that other people would never have thought of; new discoveries, things that I would never even think of.

We have a browser called Chrome and I'm going to talk about this to highlight another development in the web; it's called HTML5. There are people here who have been working on HTML5, so you know the technical details as well. For those of you that don't, HTML5 is a new standard for the web which will allow you to build applications like those that you find on a personal computer but web-based and with the same power and the speed and the graphics that you have on the web – that you have on PCs. So, all of a sudden, now, you're going to have these mobile devices which are ubiquitous with their location and so forth, and you're going to have finally a powerful web architecture, if you will, a web operating system for which you could build applications.

The sum of the two plus cloud computing is the necessary platform to build everything above it, and we at Google and everybody else are also pushing very hard on this. And my suspicion is that the next interesting startups, the next interesting new companies here in Berlin and Germany and Munich and so forth and the other technical centers will all be based on this underlying technology that's rolling out literally right now.

What's interesting – and I don't talk about this too much unless you're interested in it – is there's another complete component to what we're doing which is making money for the developers, making plenty for the publishers. And we already talked about the Newspass but ultimately, people have to be paid. You have to pay their salaries. You have to pay for the data centers. You have to come up with some way of making money. And applications developers understand this and indeed Google is one of the companies that provides a lot of revenue to support mobile applications through some acquisitions that we did. But the core message here is that, for example, YouTube, now 35 hours of video uploaded every minute into YouTube; we've also now developed advertising tools and other tools that will monetize YouTube.

So, now, we're getting professional content to come to something which was originally just user-generated and just free. We have a similarly good solution with respect to soft display ads. Display ads are the ads that move a lot. And all of a sudden, you can now advertise with movies, you could show little snippets, you could have highly personalized ads. So, where does this is all go? For the same reason that search becomes more personal, advertising becomes more personal. You're much more likely to respond to an ad that's targeted to you, it's about something that you care about, and that you're ultimately likely to buy. So, if you're a person who lives in the city and you'll never drive a car because you don't like cars – it makes no sense to show you a car ad. But if you're in Germany, you're going to want a car ad. You get the idea, right? So, it depends. And we have the capability now of targeting. Or in the case of baby diapers, it makes no sense to show a baby diapers ad in a household that has no baby-diapered children. So, the fact of the matter is we can target now and the more efficient the ad, the better the return on investment of the ad, the more likely the advertiser is to achieve their objective, which is ultimately to make money. And that money is needed in order to drive the economic engine that we all care about.

So, the underlying point of all of this – and I'll finish this up by making some observations – is that this is the greatest disruption that we've seen in perhaps 100 years. It's on the level of, for example, the invention of electricity. That's how powerful this is. And it's changing pretty much everything. It's frustrating for many people.

There's a quote from Joseph Schumpeter, "Capitalism inevitably leads to a creative gale of destruct – of disruption." And we've replaced the economics of scarcity with the economics of abundance.
So, if you were in a business which relied on scarcity, your business model is under attack. It's a problem. And it's a real problem and I'm not minimizing it any way. And it's sort of both terrifying and exciting. It's terrifying because it has to do with information and people care a

lot about information. I mean, everybody does and I learn – I know this more than anybody else because we're constantly being criticized, investigated, commented on, you know, so forth and so on because of the role that we play and I do understand that.

But it's exciting because of its scale that somebody here in the room in the next six months, 12 months could invent – could invent something that would touch 100 million people. This was never possible before. But because of the pervasive nature of the Internet and because of the pervasive, if you will, the technology reach of the things that we're talking about, it's actually possible for you to do this. And you see this in the success of new companies that are springing up left and right.

So, when we have these debates, the debates about privacy, the debates of security, the debates of my identity, who has rights: Understand that these are debates that are really about how society wants to approach this completely new technology. What norms, what roles, who has the power, who has the transparency, who gets to decide? And these are all part of how society will organize it and we'll obviously participate as best as we can.

But for me, when I look forward, I see a much, much more positive future as a result of all of this. When I look over the next sort of near future, I see this coming together in many, many ways that will affect all of us. It's interesting that there's a quote, again, this one is from Ray Kurzweil: "Our intuition about the future is very linear but information technology grows exponentially." That's why we're always surprised.

We're always surprised because of the compounding and I'm telling you, I've laid out the argument that with the growth of mobile, the growth of cloud computing, the growth of these networks, you have an exponential explosion of creativity, of change, of disruption, almost all positive, literally right in front of us.

Now, why do I believe this? Well, to some degree, I have the optimism of a computer scientist because I believe that information can help solve a lot of problems and computer science is really about that. I think computer science can help with global warming and terrorism and financial transparency because these are information problems. And so, by applying some of these principles to some of these very, very real problems in our society, we can actually get them fixed, right, and address them in one way or the other. So, imagine a future now of all of this and we're all in this and it's a pretty near future. I would start with the observation that you'll never forget anything. Not because you won't forget anything but because your computer will remember things for you. Again, with your permission, your computer will remember where you were. Of course, it remembers all of your pictures already. And again, with your permission, it will tell your friends what you're up to and

remember where they are too. So, I who like history and like to travel and so forth, it will remember where I was and where I stayed and whether I liked the hotel and so forth and so on. It will serve as my memory because my memory is not perfect but the computer memory always is. Computers do what they do well; humans do what we do well. Another example is I'm never lost anymore. When I was a boy growing up in Europe, I got lost all the time. It was great fun. You know, you'd eventually have to ask for directions or get a map. Here, it's very hard to get lost. You actually have to turn off your phone and you'd never turn off your phone especially when you're lost, right? So, you're stuck. You can never get lost. In fact, you know, because of GPS technology and others, we'll know where you are down to the foot or the meter or the centimeter, whatever measurement system you care about.

The point is your phone knows where you are and unless you turn it off, you can't get lost. Another example. People who love the Earth can love it more. All of us understand how important the Earth is with the technology of Maps and Google Earth and the modeling that we're doing and so forth, you can now understand the dramatic changes that we are making to our planet, some of which are irreversible; some of which are reversible. Using get-satellite technology and other dynamic things, Google recently announced something called Google Earth Engine which is a programmable platform by which you can actually model the changes that are being done to the Earth.

You can see the direct consequences of the changes that we're bringing on, the good ones and the bad ones, whether it's climate change or water change or food change or what have you. To me, these are fundamental because it's the only planet we've got. You can obviously have all the world's information at your fingertips and you could do it in any language because of the dynamic translation that I talked about. And so, nowadays, everybody speaks German, everybody speaks English, everybody speaks Farsi, everybody speaks the language that they care about.

And perhaps more importantly, we can help you decide what to pay attention to. I don't know about you but my problem is I've got so much coming in, I can't keep up with it. All right, in between email and phone messages and texts and Twitters and all of the status updates on Facebook and all of the information that I see in my normal web use, I don't know how to spend my time anymore. I used to, by the way. I used to live in a linear world. Now, I live in a scattered world. So, all of a sudden now, computers can help me because Google and other companies can help prioritize that using modern computer science technology to figure out what's the most important thing for me to think about right now, okay?

And another thing is: You're never lonely. There's always somebody to talk to, and even if you're traveling and by yourself, your friends are literally one text away or a video conference

away, especially when you're in a different time zone and you're missing them or you're missing your family or whatever it is. The fact of the matter is this is a pretty big change. Another example, you're never bored, right? Now, the problem is not boredom, but in fact, you have too many things to do and computers can help you, again, knowing who you care about, knowing your taste, can help suggest things. We have people now on YouTube who say, "Okay, I'll start here and I'll just keep watching." And they keep watching and watching and watching and we keep selecting things that we are pretty sure they like. And somehow, we know that they like it because they keep watching it. So, all of a sudden, the application of computers science and this huge amount of information allows the computer to make your life even more entertaining and so forth. So you're never bored.

You know, we used to waste time watching television. Now, you can waste time watching the internet, you know. But the fact of the matter is you're not bored, you're not lonely, you're never lost, right? It's a very, very big change.

Now, here at a university, I should say that we're never out of ideas. If I were a student today, I would be so overwhelmed by the conversations around me that every single thing that we talk about here at Humboldt University is something I'd say, I'd like to learn more, I'd like to hear more about this, or I'd like to confirm what the professor said because I didn't really quite believe it, or I didn't like what my friend said, or I'm writing my paper, and so forth. But if you're an intellectual and you're a person who cares about things, you could care about them deeply. And you'll fill your head so much, it'll be a headache, which I think is wonderful from the standpoint of learning. I'm very, very excited and proud of that.

Here we are in the car capital of the world; it seems to me that cars should probably drive themselves. I mean, after all, a car will drive itself better than you will when you're have too much to drink. It seems obvious. So, we're building, in fact, automatic navigation for cars using satellites and other local technologies. So that literally, you just have to press the button and here you are and you go and then the only problem we'll have with our cars is that they drive exactly at the speed limit. We're working on that problem. But you get the idea. If I talk about this to finish up, put this in context: The thing that I'm proudest of this vision of this new world is that it's a vision that touches every human being.

Historically, information services, this kind of thing we're talking about today, access to knowledge, access to universities; historically, that service, if you will, has been only available to an elite – the elite, the rich, the power, the educated.
But what I'm proudest of all of what we're doing is that a few billion people will be entering the world's conversation in the next three or four years. And for them, they'll have the same

footing or nearly the same footing as all of us who are part of the top part of the world, the most privileged, the most educated, the elites of the world. The fact that this technology is for everyone is, I think, perhaps the most important message of all about technology: that you can reach every human because we're all the same and we all are born with the same potential.

And I'm proud to say that the internet is one of the great levelers of society and it gives opportunity for people who would never have had any opportunity before. But because of it, whether it's a small village or in a strange language or so forth, they can reach their full potential. So, thank you so much for letting me talk here. I'm looking forward to your questions and thank you so much as well.

Thank you.