



Futurist Speaker Gerd Leonhard

Being Human In A Digital Society- Futurist Gerd Leonhard's presentation
at Future Day 2014 in Istanbul, March 1, 2014 (slightly edited)
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Gerd:

It is a great pleasure to be here. Thanks very much for the invitation, and thanks very much to the university for hosting this event. It's truly a great pleasure to be here.

So first of all I want to encourage you. I think going forward from today, every day that you spend at work or whatever else you're doing, 5% of that day should be the future day. 5% of your time should be spent about thinking about the future. You know, one of my clients is Google and they have a rule that 10% of your time has to be spent on new projects. If you don't spend 10% of your time on things that have nothing to do with your work you get fired. Many of the companies that I worked with you spend 5% of your time on things that are not for work, you get fired.

So this I something to think about. Spend some time everyday talking, thinking about the future and what's coming up. You know, in my work we have a motto. My company is called The Futures Agency. We're in Switzerland. We have a very simple motto: "It wasn't raining when Noah built the ark". This is so true - for so many of our clients, they're currently doing well, they're not doing bad, but five years into the future it's very likely that half of their business will come from things that don't even exist today. So I have two kids. You probably have kids. When I look at my kids I can safely say that my younger son is probably going to have a job that is not even invented yet.

When you think about this, you have to think about the future in a different way. You have to think about it in a way like this drawing that I use, this illustration. Bring it down, a very complex environment to a simple point. That's kind of what I do in my foresights.



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Also, I have a method of doing this. As the movie 'Back From the Future' says I try to go into the future and come back. You know, five years into the future and then decide what that means for you today.

For example when I worked for the music business, I used to be a musician and producer. When I worked in the music business in digital music I talked to the music companies about the Internet and I said basically you cannot keep people from downloading without paying. Because you know that's the internet, that's what computers do. They make copies. So you have to look into the future and think about how you make money with the new model, with a new system, a new logic. Because technology is interrupting us, is disrupting our environment.

Think about this, if you're a hotel, TripAdvisor can put the fear of god into you: what people write about you on TripAdvisor and reviews. I mean this is empowerment of the users.. So it's very important to look at the future and say what's going to happen in five years and then come back to today and not go from today into the future.

There's a very important Chinese saying: "if you want to know about the future, ask your children." Why is that so true? Because children don't have to go and think about how to fulfill a role and to be an executive or how to monetize, make money. They don't think about this, they just play. So we need to spend more time playing because if we don't do this, we don't discover what the future is. This is a very important point before I get going.

But basically the most important point I want to make as part of my conversation is that we're today living in the world where machines and technology are creating a handshake for us every single day. It's getting deeper every minute. If you have



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seen the movie 'Her' Spike Jonze's movie, you fall in love with your operating system that not far fetched.

I mean many kids are in love with their mobile devices and it's just one step further.

So every day we had this overlap of what machines do and what we do and the future has tremendous potential there for looking at this overlap. It's our number 1 opportunity and our challenge. Because one thing we don't want is that we have to become more like a machine so we can live in a world of machines. There is a significant danger for that obviously which I'll show you shortly.

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But if you're looking at the environment, some estimations are saying that if we use connected technology, sensor networks, connected traffic lights, connected energy to the grid, we can save 40% of the entire environmental costs by using smart technology. I mean clearly this is tremendous possibility. At the same time you know, doctors are now having access to a giant database of cancer cases when they're at the bedside of the patient. Think about the changes that makes for their role. As students can learn things online, anything, you can learn anything online, you don't have a degree, but you will get a job in an Internet company because they prefer you over people with a degree at least for now.

Then we have digital money. I mean imagine what this is going to do to the banks, insurance companies. Digital money is a certainty. In ten years, we will not be carrying cash except if we're worried about privacy. So there's huge amount of opportunities here and just as an example, you know what's happening today because all of our data is going on to the Internet. Everything we do, everywhere we are, everywhere we move, everything we share, everything we like, there's a saying in America that says that Google knows you better than your husband or wife. It's true.



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Think about this for a second. If you used Google for 7 years and you've been logged in, you know, like a good citizen of Google, then they know everything. They know all about your fungus nails and whatever problems you have. So now we're looking at this digital universe and we're looking at a global shift from physical to digital. We're looking at this global shift because now all of a sudden everything that we're looking at is digitized. So as an example, security, 50% of all military and defense budget in the future will be based on digital problems, digital wars, digital security. So that's going to change our entire economy, how we do this. Now we can already hack into medical devices. You have a pacemaker? Somebody can find a way to get inside of your machine. You have a self-driving car, like Google? Imagine if somebody can break into that car. Once we have 20 million of these cars, they can break into your car and you lock in there for the rest of the year or drive you against the tree. So a lot of things will change because of our digital environment and this is also because we have this evolutions and interfaces. I mean when I started using computers, you have to type and then you have to figure out how to use it.

Today, I gave my mother an iPad, for her the iPad is the television. She doesn't know there's a difference. She says I'm watching television but she means the iPad. Because she can just touch it and then it works. In the future, we will be able to speak to our computers. We won't be typing in a few years except for certain purposes. We'll just speak. We'll gesture. We'll have holograms. We have headsets. It is already possible for a person that's completely paralyzed, a quadriplegic to walk again using brain wave computing interfaces with a skeleton, an external skeleton. It takes three years and a million Euros but it's possible.



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So a lot of these things sound like science fiction. You know when you look at technology and you're saying okay, these people are using devices to do all these things, much of it

sounds like science fiction. But think about this for a second. If you're watching a science fiction movie like Blade Runner, Minority Report, Oblivion, of course AI and Her, many of the scenes in these movies are reality today. It's mind boggling to see how quickly that changed. A lot of these things will be just as real as SMS in ten years. That's a scary thought when you're not 15. So back to the movies, years ago Star Trek had a device called the tricorder. This was in the '70s, I think right. This device will analyze your blood and everything and actually give an opinion what's wrong with you and also fix you in the process. Well now the tricorder challenge, part of the XPrize, is giving this guy AndraKa some \$23M to invent the tricorder. The tricorder pokes your finger with blood, you can cough into it, you can touch it, you can measure your pulse and it gives you in 14 minutes a better diagnosis than a team of 10 doctors (allegedly).

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Now if you're a doctor you wouldn't necessarily be so happy about this comparison. I'm not so sure it actually works, but imagine what this does if it hits the market in a few years. Every old person that cannot easily go to the hospital, you can send your grandmother this device for 200 Euros and you can always make sure that she's okay. That's tremendous but at the same time maybe it's not a human. It's a machine. It doesn't do the same thing. So it has good side effects and also bad side effects but we're experiencing an age of exponential computing power.

You know, I'm not a technologist, I studied religion, theology, Greek, Hebrew, and music so I'm not a tech guy. But I can tell you that technology is absolutely exploding in computing power. The power that we have in our mobile phone today is



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more than the entire raid arrays of NASA and the Pentagon put together just 15 years ago. Mind-boggling. So when you're looking at all those things that have happened like genomic analysis, people growing older, we are actually all of us are gaining eight hours of life span every single day in the West.

We're getting eight hours older just because of advances of technology. Many of our children will live to be a hundred as a standard, can you imagine this, what that will do to everything our social system, everything, social media.

So for example what's happening with medicine: a 7.2 trillion dollar pharma business could be wiped out by the fact that we're going to be able to fix diseases before they occur. Now personalized medicine, how far away is that? 10, 15, 20 years? So we're looking at fundamental changes in how we do things, the shift from ego to ego I'll talk more about that as well.

Last week in Barcelona was the mobile summit. The device shown here is a new mobile phone by FireFox, the browser company, it will cost \$25, a \$25 smart phone. In India we have a tablet called the Aakasg, selling for \$28, a tablet which sold already 35 million copies. Every person in the world, literally every person that is connected and we're talking about 5 billion people in less than five years will be traveling with a smart device. Think about what that means for business, for politics, for understanding stuff, for education, for payments, for all of us. 80% of that traffic being mobile. I mean you guys are WhatsApp users, I don't have to ask, everybody is a WhatsApp user. If you don't know what that is then maybe you're not a user. But Whatsapp allows you to make, to send free messages over the Internet right, over data? 480 million users.

Facebook purchased WhatsApp for more than the purchase **price of** Sony Corporation okay, no revenues almost no revenues. WhatsApp has, for \$43 per user. So you know



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what's going to happen next with this disruption. If you're in a telecom business you're not happy. Anybody here in the telecom business? You know what happens here is that you don't use SMS anymore. You know how much money the telco's were making with SMS every single day? Take a wild

guess right? \$300M a day, every single day. That money is leaving right because people can do this now.

So now we have things like automatic translation also launched at the mobile summit this week where you can call somebody and actually have a conversation with people in 24 languages in real time. I can call somebody in Chinese and speak in German and it comes out in Chinese in real time. I mean this is a future that probably makes you think if you're parent, if your kids are ever going to learn languages. You know, why would you do that? I mean it's different but definitely a question.

So I can safely summarize for you, if you haven't known yet business as usual is dead or dying okay. If you work in a company where you can do business as usual congratulations, continue. But that will be the exception. First the music companies, the movie companies, the publishers, the telecoms, the banks, the mining companies, the transportation companies, the power companies and so on and that just goes on in this succession because of technology. So what we have to do now in the future or today starting today is to reinvent what we do and how we do this?

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In an entirely different way and I think that's going to be done in such a way where we are in this devil's cycle of doing business in the same old way where we have to find a way to out of this. Because, yes I would grant you in many ways it's still working just fine. But you can agree that pretty much in the future 98% of our businesses will not work fine in the same



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way they did today because the consumer is changing and the world is changing and in a very fast pace.

So a few days ago I got into a Twitter fight with Turkish airlines. I'm sure there's lots of reasons to tweet about Turkish airlines but I will not get into this however, it has been a hobby of mine to discuss things on Twitter just because I want to see how people react. So Turkish airlines has taken my tweet and

I've received several phone calls and emails about this topic. This would have been impossible. Think about that five years ago. To get anybody to pay attention to it, which is, you know, so what you know, go away. Now everything is in the public. You can't possibly avoid this. You want to grow then they're going to take up this concept and do something with it and the same goes for what has been referred as likeonomics. There's a great book written by a friend of mine Rohit Bhargava called Likeonomics. You should read it. Because it's talking about how important it is for your customers to like you, to like you even if you don't fix the problem. This is the interesting part.

Dell has 47 people working on Twitter to take complaints about Dell and less than 1% of those complaints are being fixed. But 95% of the customers think that because Dell does this, it's a great achievement you know, it's a public discussion about how bad they are. Likeonomics is crucial.

Now we're entering into a world of finding information, you know, that Google is in the middle of transforming themselves into an artificial intelligence company. It's no longer about searching the web. It's about searching us. Google is searching us. We are the content of Google and of Facebook because we create the meta data and all the stuff that really matters. So what Google is doing now is to say okay in the future how will we search? We're not going to actually type stuff in. We're going to hold our mobile device over the food and find out what's in it. That's hard to do but people are



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working on that. We're going to find augmented information. We're going to look at books like this.

Search becomes seeing, feeling, hearing, touching and thinking. This is only a few years away. So think about what that does for just about everything, that sort of giant brain in the sky. In fact Google calls this the global brain. They have a global brain project. It's pretty amazing when you're thinking about the logo of this event being a brain. And then we have

the Internet of Things. Many of you may not know what this is but the Internet of Things is essentially the concept that whatever we are doing as humans is now happening between machines. Here you see the connected traffic light. This light was \$45,000 four years ago. It's \$3750 now. This traffic light, this street light connects you and filters – figures out who you are when you're walking by. It provides Internet access. It measures the air quality. It sees how many people are walking by at what times, so that we can regulate traffic. It does all of these things that makes it smart.

I mean apart from the fact that this is an extremely powerful technology, again we could save 40% of energy cost if everything was connected. Cisco says we're going to do have 75 billion things connected. Now our wrist watches, our glasses, our suits, our traffic lights, our sensor works everything. Apart from that it's also a scary thing. So what happens to our personal data? What happens to our privacy if the trashcan knows that I've walked by? Big question.

Now you have dogs with tags. You lose your dog, you can find him and now you have babies with tags. I don't know how you'd lose a baby but some people manage. But the thought of this, now we even have diapers that Twitter when they are wet right? Can you imagine. It's called Tweetpee if you want to see something funny, take a look. 75 billion connected devices



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so everything connected, everything intelligent, real time, everything. Now I can tell you this is a nightmare or a nirvana. I don't know which one. It's obviously both. I mean if you're a tech company or a mobile company or a marketer, you would say oh this is fantastic, I can make lots of money with this things. But there's many side effects that we have to think about and want to flag some of those.

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So it's a question of balance. You know, technology is a funny thing because technology does not allow us to say you know

we're either off the grid or on the grid like The Matrix, you know, red pill, blue pill. That's not possible because the reality is if you're engaged in a business or in anything, you cannot be off the Internet right? You can't be off the grid that's not possible. You can move to the mountains of Switzerland where I live and take care of cows or you can move to the Amish country in America and maybe then you can be off the grid. So it's really a question of balance. We cannot afford to use technology that does harm to us because it's becoming part just like air or water. The Internet has become like air. So bottom line is I think for some of the issues in the digital world, which is without any doubt coming upon us at mind boggling fast speed.

The Internet is becoming a place where all these things are becoming completely obvious. We have to be connected, we have to be human centric, we have to be sustainable and I'll talk more about that in a second and interdependent. If you asked companies 20 years ago about what their primary strategy was, they'd say we want to be independent so we can rule in our area like Microsoft did. We can make lots of money and keep it for ourselves.

Today if you ask companies what do they want to do? They say we want to be an important player in the ecosystem. We want to be indispensable. But they know that they cannot actually own the ecosystem. The only company that owns



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their ecosystem is Apple. That's an interesting side effect. You cannot be completely independent in a world that's completely dependent and that goes for energy, that goes for everything that we're thinking about. Then there's these things, you know, the internet is enabling all of us to become intelligent and devices to become more resilient, learning things and it's forcing us to be open and exponential.

Now there's thing you can do about this. You can either say okay I'd throw this all away and I don't become part of it or you just do what happens. This is something that we see in general terms, everything is moving on this trend from ego to eco, to the connected world, everything. Because in the connected world, we can solve very large problems. We can solve hunger, terrorism, energy, food. But in the connected world, you can't live in a connected world and say you know whatever happens here I get 95% of it.

That will clearly not work and that was the oil companies for example or the record labels who did this. But that is ending. So this is really a very, very big shift that we're seeing. So back to the key theme here, human machine futures, how much of us is already connecting to machines? How much are we outsourcing our brains. Now if you sit at the bar with a bunch of guys ten years ago we sit around and we talk about football or women or whatever right, whatever right? You know what we do today at the bar? We're looking at what kind of apps we have on the mobile phone. It's said isn't it, right? Because technology has taken over to such a point where it's so important to have this. So what is going to happen here? I think you know, if you're looking at products like Google Now that allows you to have Google anticipate your next move. If you want to try Google now, you can try it on any phone. It's part of the Google app but you should give it a try because it reads all your information and it tells you what's happening next for you.



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So when you're landing in Istanbul it says there's a traffic jam, you should call him and tell him you're half an hour late, do you want me to leave a message? It runs the life for you. It runs your life. Of course that's what technology companies want. That's what Amazon, eBay and Yahoo and Google, they want to run this for us. They want us to be the OS. They want us to feed this OS. They want us to outsource the brain. In many ways it's convenient. So I'm outsourcing my brain to the Kindle, you know, or eBook reader so now I have 250 books on my Kindle. I can't take them with me on the airplane. It's better for me. But what happens if it doesn't work? I have nothing to read? So there's a dependency that happens here.

What happens with this you know, you hear about this term called Big Data. It's very fashionable, it's more fashionable than social media, which is another paragon there. But what's happening with data is that we're now thinking about look at this curve, you know, how much data are we generating? Every single person in this room you're broadcasting where you are, what you like, where you've gone to, what kind of comments you're leaving, how you're connecting with people on Facebook, it's all there.

[0:25:17]

There's lots of good things about that right but what happens here is that data is becoming more powerful than oil. You know I'm going to Dubai tonight to speak at a telecom conference. Tell that to people in the Middle East that data is more important than oil. This is of course what they want to know about how they're going to get beyond the oil. So what happens is lots of studies saying we're looking at a future where the information business and the data business will make more than 10 trillion dollars a year which is more than all of the fossil fuel companies combined. So data is truly the new oil and that really changes our position.

So here's an important question there. In this future you know, the all seeing eyes so to speak because we're always connected and we're always doing things there. What are we



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going to feel about? Everything can be recorded, saved and searched. Everything is being recorded. I mean just imagine the reality of a world that actually has Google Glass which you're maybe familiar with. You know, that is a mobile phone sitting on top of your nose with a glasses-like set-up. Everything recorded, every store you go to. So this is an important balancing act that we'll have to think about because this is the reality of the future that we're going into. The power of technology is exploding exponentially. It's becoming cheaper every single day to the point to where technology is like air, that's probably better than air because the air will be bad. But technology increases and our privacy and anonymity completely goes away as a consequence.

This is not something we would want because a world where we can't be anonymous is no longer actually a human world in my view. This is very important to keep in mind, an important balancing act for the future. Then of course you know I'm sure some of you feel the same way offline is the new luxury. Not to connect, you're saying aaashh, I can just be in the moment, right. This is the new thing as a huge trend. Because guess what? It's not human to be constantly sucking at the end of a data pipe because you know our brain cannot take in all that information. We have to think about what that means for human applications. If you're in the tech business, you have to transcend technology. You have to use technology and then go beyond it right. Technology as its own purpose is useless to us as humans. It serves itself. It's a self-perpetuating machine.

So Buick has an initiative called In the Moment, a car company sponsoring initiative to be in the moment. Suggestion to you, you know, every week for one day or every two weeks, I do it every two weeks, be in the moment, don't connect. Figure out what happens there. Do you have anything left to say to your children? Just kidding. So offline is a luxury that we shall cultivate. Here's a short video clip that shows the current situation.

[video clip playing]



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It's a fortunate accident that Coke is actually a sponsor of this conference. But there is a world outside of this and I didn't get to actually read this but technology has no ethics. This is important to remember. Technology is about technology and let's not confuse the issue. We can't fix social problems or political problems or whatever problems with technology. Technology does not provide that.

By the way I'm taking questions on Twitter so if you want to ask a question just use the hashtag here, this hashtag and ask me a question. But not in Turkish please but in English and I will take questions through Twitter as well as in real life. You can actually talk to me as well.

[0:30:10]

So Sophocles my good friend has a great quote that says 'Nothing vast enters the life of mortals without a curse.' That's so true. Now when we think about technology today, we feel very empowered. We feel very comfortable with it but there's a curse. There's always a curse when there's – it's like nuclear power. You know, no matter how you agree with them we should have nuclear power or not that's a different topic. It does solve the problem but it has a gigantic curse. So what did we do? We can't just say no to everything that has a curse. We have to figure out a compromise, a balance.

Take this for example face recognition. Face recognition is widely used around the world for all different applications and here's a short clip, I'm showing you how that works.

[video clip playing]

But the bottom line is this. This could be quite helpful for law enforcement and for criminals and so on. But imagine if you do this in a store which stores want to do now. They want to be able to identify us when we walk into a store to figure out that I'm dear customer right and send an alert to everyone to come running to me. Is that a good thing or bad? Is that a curse or is it a blessing? It's obviously both. But that doesn't



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mean we should outlaw technology. I guess we have to have a balance with this. So technology is really changing how we do things. This is one of my previous jobs here, I'm in the middle there. No just kidding, how we used to build skyscrapers. Now in the future we're going to have a combination of people building those skyscrapers right. We have little tiny robots coming along. That's already happening. So you know, it used to take 400 people to build an iPad, now it takes 33 people to build an iPad but the future is it takes zero people to build the iPad.

Because at a certain point technology can do that. So there are studies saying that, depending on where you look, between 30 and 40% of all jobs could be done by automation in the next 25 years. For example if you're a taxi driver, probably won't happen in Istanbul in sometime but if you're a taxi driver in Las Vegas, you know, we're going to have self-driving cars, taxi drivers are not a good job. Translators? You're a translator? Hello guys up there? Translator, machines can probably do that pretty well not entirely perfectly but well enough to really cut into your activities or bookkeeping. Take bookkeeping right? 50 million bookkeepers were done away by software. A company called Zero in New Zealand. So what does that mean for us in the future? Where do we go? So what will it mean to be human in this world of technology? This is a key question. I think I have a bit of an answer but I leave that to you to investigate as well. What does it mean to be human? My thing that I want to suggest to you is that to be human doesn't mean we're going to beat computers. We're going to be better than machines.

We have tried that. We have tried being better machines. You have faster calculating, faster return, you know, faster machines. It doesn't work. We have to be better humans in the future, not beat the machines. I'll give you a short clip here from Star Trek which illuminates a point.

[video clip playing]
[0:35:02]



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So it's interesting, a scene from quite some time ago, 'no emotional impediments'. It is in fact those emotional impediments that are our future because they're not copied by machines. It is in fact all of these things that we can do because we are human that will make us valuable in the future. Otherwise you know we can greet the robot revolution because they can calculate quicker and be quicker.

If you're looking at this graph, this is a very important graph from – it's a simulation from Lake Michigan, how long does it take to fill up the lake. It shows exponentiality at work. So basically what we see here is that it takes forever to get going an evolution of things, you know, to grow quickly. But once it grows a little bit as you can see here, in a very short time it goes boom because it's exponential. It grows exponentially. If you don't think that machines can be as smart as this, it's just a question of reach and divide the takeoff point, the exponential point. There is a great saying by Ernest Hemingway that says how does a person go broke gradually then suddenly. And this is so true for technology. When does technology take off? Well it takes a long time but when it takes off, you take cover, and that's what we're seeing all around us. That's what we're seeing with printing organs, that's what we're seeing with all these things like nanotechnology and neuroscience and all these things that we're looking at that they're gradually but then suddenly. We have to think about what that means for us.

I'll skip this one because I don't want to play too many videos for you but simulating the human brain essentially looks like this. Trying to simulate the human brain today we're at this point to where if you ask the computer, if you say to the computer 'After the holidays the scale becomes my enemy' which means you ate too much in the holidays. It does happen occasionally. The computer will not know what to make out of this. No computer in the world will understand this statement today. How long will it take for that to change? Quite some



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time. It's about semantics, and understanding the stuff that's in between the lines.

So one thing that's happening I think that's really quite interesting in many ways is that we're approaching a world that is omniscience, knowing everything. Because today in this world, it's not just Wikipedia but you can tell you know already there's applications like Google Now and others that will go out and catch information for you and deliver it to you in real time. This is the future of information technology. We don't search. We just have things delivered to us. So omniscience is within reach. Is it a good thing right or a bad thing? Well I would say it's pretty dangerous to be ignorant but it can be just as dangerous to be omniscient. Both things are probably true.

So what do we do about this? What do we do about a world like this? This down here is a project called the Oculus Rift, which is virtual reality glasses, glasses that you wear to virtually do things anything from flying into space to solving complex problems to operating on a patient to everything, to live in a parallel reality.

The bottom line is this, we're living in a world of exponentiality and the stuff that you see in Her and other movies about artificial intelligence, you know, we're only right now at the lowest point of that pivot curve. There's many good things about this for example. If I'm in the advertising business, I'll be able to figure out much more accurately how to reach people. If I'm in the energy business, I'm much more efficient with distributing energy. There's many good things about artificial intelligence. So then we have to figure out what is this future are we going to end up in, this space where we're connected to this network and how will the interface look like?

Google is already suggesting to us a world of augmented humanity. In fact what Google is doing it's outsourcing our brain to their service. So I have my Google+ that's all my relationships on Google+ right? I have my documents they're



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all on the server, I got my email which they're running for me. I got my search history and pretty soon I'm you know, I'll get a tattoo that says Google or owned by Google. It's one of my clients so I can beat them a little bit.

Augmented humanity, it's coming right? What did we do about this? I talked about the movie Her. I'll show you a short clip from this but basically we are really starting to have relationships with our technologies. And we should think about what that means. How far do we take this?

[0:40:07]

[Video clip playing]

If you have a chance to watch that, you should do so. So what we're facing in the future now is what's called deep learning. Deep learning means is that computers can actually learn what happens in between the lines. They can understand the semantics, they can use massive computational power to translate stuff in real time and to do things that were previously considered human. Deep learning is what we're going to see in many parts of our society. We have to think about what that means for us in the future. I mean if we're looking at automation, computerization, you know, the robot that makes you coffee, this is the first bar in the world where a robot will mix a drink for you. I don't think he'll mix very good margaritas but maybe. Here's a computer, a robot that prints in your handwriting. I mean this machine actually analyzes your handwriting and acts like it's you to write real live letters. We're already at that point.

So we're looking at the future, you know, there's many interesting angles about this, a total redefinition of work and jobs. I would submit to you that we're extremely lucky to be at this point. It is threatening to think about a job that you have that involves any sort of repetition. These jobs will be eliminated by machines to a large degree. But at the same time think about how that frees us up for other things. Of course not every cab driver can be a graphic designer



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because of course a lack in the skills so it has great impact on education.

Kevin Kelly has come up with his graph saying that existing jobs will change and new jobs will come up. My colleague Thomas Frey says 60% of the best jobs in the next 10 years haven't even been invented yet. So what is our role? Is our role to hold on to the old jobs and fortify them against technology? I don't think so. Our role is to invent those new jobs. There are jobs that are going to happen. I mean the jobs that don't even exist. Studies again, now if you want to read the Oxford Study, just download a PDF, they're saying that half our jobs in 20 years could go away with technology revolution. What are you going to tell your kids what to do? How are they going to learn? Looking at this list here, 100% chance of automation for telemarketers, for sewers for mathematical technicians, for watch repairers, for cargo agents, for tax preparers, the list goes on.

Consider yourself lucky if you are a plumber or an electrician because those jobs are not going anywhere so that's a good job to have in the future. This wave of data that's becoming available it means all the jobs based on data becomes so much more powerful and easy to do. So that's definitely something we should look at.

Then in Switzerland where I live we have an interesting proposal that maybe the Turkish government can consider, eventually. That idea is to say well if we're going to have computers doing jobs maybe we should just pay everyone to do something that is not usually paid for, basically a guaranteed minimum income. In Switzerland we have on the ballot this year a proposal that says we'll give 2800 Swiss Francs a month to every person in the country whether they work or not. This is a crazy idea. I mean we're only 7 million people, it's not going to pass this year. But think about the logic. Wouldn't it be better to pay people to do what they want to do which I call workupation – you know, a mix of work and



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occupation than to become criminal as a consequence of unemployment. That's a question we're going to face in five to ten years. Because here we're at the university clearly we need to ask this question what is the impact of learning on education, will we still need degrees? Well clearly the question is not black or white or yes or no. We need places, we need degrees, we need certification.

But what happens now is that we're living in a world to where it's much more important to ask questions not to necessarily know the answers. Because that's the world that we are building our own world where we need to rethink how we do things. Education needs to encompass this I mean clearly this is a large change for educational institutions to connect with that fact.

[0:45:07]

Of course as you know you can already earn degrees online and basically in five years we're looking at the complete digitization of education. Textbooks, lessons, videos, certificates, virtual learning, vocational training, what a fantastic opportunity for any traditional educational institution to transition. So I have one piece of advice for you because I work in the music business for a long time. Don't be a record label. When you do what the music companies have done, you end up with losing about 80% of what you had before.

It's very important also that we consider we are in fact going back to a much more human model of education which is going to the right brain rather than the left brain. Well traditionally speaking at least the left brain is in charge of logic and understanding things, in calculating it. This part of it machines will do eventually all of it, most of it. So we're moving back to a design part, a place of recognizing patterns of imagination and education will change a lot because of this.

So when you look at the immediate future, we already living in this world where everything that we do is in the cloud. So our music is up there, our movies are up there with Netflix or



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whatever channels we're using or Hulu or whatever and our books are up there and our health records are in the cloud. Everything is moving into the cloud. That's why cloud computing is such a big deal. But ask yourself the simple question, do we want to move into the cloud as a part of the cloud?

Do we just want to be another device in the cloud? Well the answer is you know, we want to use that cloud because it's helpful. But we don't want to become part of this cloud. There is a big difference here. Evgeny Morozov, who is a really smart writer and one of the biggest Internet critics, he talks about what's happening in this world is that people are looking at technology as a giant solution for everything. So we have a problem, we use technology to fix it. The government cannot fix the roads so we have a website where you can report that potholes. We have all these things solving large problems and we can essentially remote control everything.

Google will solve death. This is a real cover from Time Magazine or the other thinking is we have environmental problems, we change how we run the world. We do geo-engineering. We cannot control pollution so then we go in and we engineer the weather. This approach is called solutionism. I think this is a very dangerous thing. So clearly what it means is that I would question this and say is this really the way forward? That we invent a new technology to solve the old problem, where we really need to look in both directions I think there.

Then we have data the power of data. I mean if you're not aware of this, you should think about this for a second, how important data becomes in an everyday environment, what people know about you when you buy groceries with a loyalty card, all the things that they have there. Mobile is the external brain and artificial intelligence is the connector. You've seen this scene from Minority Report where he enters the store and the store scans his eyeball, his retinas and figures out who he



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is but of course he's got it from somebody else so it's a tiny problem. But think about this. I mean this is not far fetched from our reality and things that we're going to see in the very near future.

The CEO of IBM said something I wanted to get your opinion on this. The CEO of IBM said big business decisions will be made not by experts or by intuition but by big data and predictive analysis. That's basically saying the fortune cookie now you know what's going to happen so that's what you do and precognition would just anticipate things. I want to see a hand sign, who believes this is true that big decisions will be made by big data and predictive analysis? Let me see hands here. It's okay. You can lift your hands, there's no punishment in the process.

The other side of the equation is Albert Einstein who said imagination is more important than knowledge. He also said not everything that can be counted counts and not everything that counts can be counted. So which one of the two is it? I'm not going to ask for hand signs again because you're all going to lift your hands and make me look stupid. But those two things are combining. We have to figure out a compromise between those two things. I think that statement from IBM is pretty dramatic when you think about you know, that the machine could do that. Could do the analysis. Is that what we need in the future?

[0:50:04]

Ray Kurzweil who's the futurist for Google, he says Google will soon know you better than your spouse. I think they already do. So Google becomes this giant adjunct to what we do. Then there's a great book, I read recently by Dave Eggers called The Circle. In the book he says that the paradigm of a digital society is that 'All that happens must be known'. I would submit to you that is the end of the road if we go on this direction. It's good to know a lot of things you know, ignorance can be dangerous but omniscience is more dangerous.



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Because what it does it creates a giant machine. So we can expect in the near future a lot more what I call data wars.

On the left we have a Obama saying yes we scan and on the right-hand we have Merkel saying you know, I've been scanned and I did warn her about this but she wasn't listening. But in the future, we can expect more discretion about what's happening with data and this is crucial. We have to discuss how to keep data safe because otherwise we're going to become entirely digitally naked. This is a very big issue. So I want to talk about one more thing and then we'll do a wrap up and take some questions. First of all, the concept now is of a digital world is that we feel empowered for everything so I call this omnipotence. You know, we feel like we can do anything. This is a very powerful feeling for computers or for people in a computing age when we can actually change our genomes to solve problems, when we can do personalized medicine. Very promising but also quite dangerous as we said before. If taken together with what I call omnipresence, you know to be present anywhere. I'm trying to figure this out because I have to travel a lot so that's a good topic for me. But telepresence, holographics, virtual travel, omnipresence is within reach being at different places at the same time. We're going to see a lot of this.

This is an interesting angle on this. This is an advertisement by Microsoft and I think it never actually went public but I got it somewhere where they're saying that you know, you can actually get work done while you're having the happy hour appetizer or while you're hiking in the national park. The consequence of social media and mobile is that 20% of people who work in the spending – I mean 20% of time is spent working more than before because of social media. We're actually working more because of technology. So the question is and this is a good question for all of us to ask when we go home is technology captivating you know, exciting, or is it capturing you. Ask yourself that question. Captivating is one



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thing but captive is another thing. That's something we really have to watch out in the future.

No time to play this video but this is a video by Apple called Misunderstood. You can watch it on YouTube. The question behind this video that shows a young guy making a movie. Don't turn on the music, just leave it like this. It shows a young kid making a movie at Christmas but he's not participating in the family activities because he's making the movie. You should watch it on YouTube it's called Misunderstood. The question of technology is no longer whether it can be done and this is very scary but whether it should be done.

So just five years ago we're saying now if we can keep the world's information and all the information about us in a server, we can do all these miraculous things, and now we can do that right? Everything is being kept. The question is not whether we can do it but whether it should be done and who controls it. What kind of rules do we have? What kind of ethics do we have?

So I'll give you a quick summary and then I do hope to get you to your tweets here. I've been monitoring it. It's mostly in Turkish which I can't help with but I will take another look at this. So quick summary going back to what I said in the beginning. We're moving into a future that's about being connected but at the same time not being technology centric but being human centric.

You should gauge every company, every politician, everybody, you should gauge them not on whether they furthering to be connected but also if they're going to make it human. Because in the end that's what counts for us. Everything is going to be about being sustainable. I always say when I work with Unilever which I do occasionally that sustainability, sustainable is the new profitable. It's the new definition of making money, is to be renewable.



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All of these things are quite scary. You know, when the system becomes intelligent, when it becomes exponential, when it becomes abundant, you know, plenty, when it becomes open, it brings up the risk. I mean think about this for a second. If you live in a controlled environment you know, you don't allow much change, it feels safe because nothing is coming in from the outside. As soon as you start connecting with others, and you're looking at an open technology for example it's less safe, right, because open technology is change and this is why we have this challenge of saying we're living in a connected world but the risk increases. It's a world that that is basically what we have.

[0:55:40]

There is no other world. Just in case you're wondering, there is no more disconnected world. You can have it in some places in the Swiss Alps or wherever right but we are now living in a digital society and that's it. There is no going back on that basic simple fact.

The other thing is that we have to be careful of because you know when we're looking at technology we always get really excited about possibilities. But let's not confuse the realities. When we have cool technology and all this data and we can be smart and we can use machines to support us, we shouldn't think of ourselves or of our customers or anybody else as machines because we're not. We should not fall prey to machine thinking. That everything can be calculated, everything can be measured, everything can be mapped, right. Machine thinking is a huge issue.

The other one this little clip from a movie the I quite like is called Connected by Tiffany Shlain. It illustrates the point we're no longer living in a world where everybody has their own tree. You know where companies are living in their own domain where people can run things by themselves, where we can have four oil companies controlling the flow of money around the world and the economy as a consequence. We're



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no longer living in that world. We're living in a world that's completely interconnected.

Telecom companies must talk to media companies. They must talk to advertisers. They must talk to internet platforms. We're basically connecting business technology, ethics, culture and politics in this way and there's no way around it. That's also a solution for a lot of large topics of course is to create new ecosystems.

So I mentioned this briefly but what we're heading down to world and we've had this discussion for a long time I call this sustainable capitalism. It's not invented by me but you know, as I'm sure you're aware of, there really isn't much of an alternative to capitalism in itself. Everything else has been tried. But the kind of capitalism that we have, must reinvent itself to be renewable right, to be sustainable because otherwise we're reaching a ceiling and explode. In terms of climate change, in terms of resources, in terms of everything. So that has been referred to as the circular economy. Basically taking and giving in the same process. This is really what we're discussing on a global level now and this is what technology affords us. Technology actually gives us those tools to create a circular economy. Some people have referred to that as the triple bottom line. I think if you'll read Jeremy Rifkin, you'll find out more about this. The triple bottom line is about people, planet, and profit, those three together, to make those decisions together.

So I think that's our future as humans going in this direction and Patagonia and others have already found this out that emotional impact on customers will be in direct proportion of the social purpose. So ask yourself this, you know, going back to your office, does my company have a purpose, do we have a message? If you don't have a purpose, you're not fit for the future, all right, because people are looking for a purpose. They're not looking for you to just make money but to make



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money with a purpose and this is a crucial thing I think that we're seeing around us in ecology everywhere.

So anyway I will publish this PDF because you know, it's been quite a few slides and you've been very brave sticking your head out on this. I will put it up on my website tonight, FuturistGerd.com. It's not hard to remember but otherwise just search for GERD and also on Twitter @gleonhard, I will put up the PDF so you can download it later. We will have a video. So we do actually have sometime for questions and while you're warming up to ask questions in real life, I'm going to look at the machine. Yeah I have a new app that actually answers the question also. It's called the Futurist app. No, just kidding it's not real. Do we have a question here? Anybody in real life? Now don't be shy. Okay there's one right there. Should I get the headphone?

[1:00:12]

All right. Go ahead.

Gerd: Oops sorry, okay here we are. Go ahead.

Participant: What's the difference about artificial intelligence and machine learning?

Gerd: [Laughs] You made me put this on, now you have to speak Turkish. No, never mind. What is the different what?

Participant: Okay.

Gerd: Where are you?

Participant: What's the difference about machine learning and artificial intelligence?

Gerd: The difference between artificial intelligence and?

Participant: Machine learning.



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Gerd: Oh, machine learning. Well I'll make it quick. You know, I'm not an expert on artificial intelligence obviously but basically what artificial intelligence does is that it tries to simulate what we would do as humans. So there's a learning process involved. For example the Google self-driving car is a great example. If you're in the Google car, it's driving itself. If you go down that road and there's a frog sitting on the road, and it's a double yellow line, the Google self-driving car will not do anything because it can't kill the frog, it can't go over it, it can't cross the line, it doesn't know what to do. It doesn't know that you can break the rules and it will sit there for the next two years until something happens.

So artificial intelligence would say you know I've seen this before and it's just a frog. You know, I can go around it. It would make a decision of some sort. So this is what we have now with artificial intelligence, very simple things like recommendations and others is that it can act a little bit more human but that's a long way away of sentience you know, actually understanding life. You know, that's really quite different. As compared to deep learning and those kind of things of course they go together. In deep learning really the idea is to say that the computer can make their own decisions, within reason to figure out to be more proactive. Any other questions or comments, Turkish or not? There's a question right here.

Participant: What would be the major competencies of the future business managers or leaders?

Gerd: Very good. Major competencies, I think but given that we're giving up a lot of competencies that are now done by machines in the near future, our competencies are things like negotiation, discussion, discovery, imagination, all the stuff that we didn't want before. We don't want somebody imagining things. We want them to just get stuff done. But now the future is the reverse of this. There's a design process.



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There's a negotiation. There's understanding machines. There's understanding a wide context and of course global thinking. So I would maintain that most companies I work for in the future, we all have to be a little bit of a futurist to be able to move quicker.

Because the other thing is that's really important is speed. We have to become quicker at understanding and changing. If you see all the really big startups that are happening around us in technology and stuff they're all people who start from zero to whatever in 18 month(s). Most companies take 18 months to have a board and discuss something. So we have to be able to move faster, be more proactive.

Now the other thing I think that's important to understand is as in business is that most of the developments and the funding and the reality is moving to emerging countries. It's moving away from the mainstream of business, US, Europe. Turkey has a very interesting position there, I think you know, being there and here in connection. That could be a very, very powerful position to be in clearly. So it's not an emergent country obviously but being in the middle between all those things could be extremely powerful.

So I think we have to understand that innovation and growth is all moving to the guys that didn't have anything. So the South and the East and that will create fantastic opportunities. One more point on what executives have to understand, I'm 53 but it's very hard to understand all the stuff that happens with technology but sometimes it's a very good exercise to pretend that you're 15, to pretend to go inside of these things that only kids do. Because if you do then you realize the changes that are happening while they're happening. You can't actually learn how to swim without getting wet. If you don't understand how this actually works, you'll and ever make the right decision. It's very important to be able to simulate and understand technology. You know, I'm always fighting this discussion between technology and humanity. I think the next



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ten years we're going to come to a point to where we can find the good balance between those two using technology, becoming more human as a consequence. That will be a very, very large debate about how that will actually happen.

[1:05:20]

Other questions?

Participant: Hello. A few years ago I was watching one of these angel investors program on television and some business startup owner had invented some kind of technological teddy bear which was able to tell fairytales to children for night's sleep.

Gerd: Okay.

Participant: And one of these angel investors had told us well that's a good idea but it's not the job of technological teddy bears to tell fairy tales. It's father stuff or parent stuff.

Gerd: Yes.

Participant: And what do you think is the missing link between this technology and the future of humanity? What do you think? Which kind of startups will fail in the future in terms of technology?

Gerd: Yeah. Very good point. I think there's a lot of technology that's trying to essentially replace what we do as humans by using something that we can buy. For example in the segment of fitness and personal medical care, there's like a hundred things you could buy to make you better and fitter. But what it does, it just transfers our responsibility into an app. The app happens to make money which is a good thing but it's short lived. Really good technology changes us as people in what we do and how we do it and empowers us. It doesn't allow us to transfer our jobs into other things. You know, for example there's a fork that was called Happi Fork. You may have seen it – the Happi Fork is an invention by a French guy that you use the fork to eat and if you eat too quickly it vibrates and it



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makes you eat slower and be more healthy. So when you think about this, you could have a thousand things like this. It's controlling your life and telling you what to do.

At a certain point, you have to wonder what the actual purpose of it is. So you will not see a lot of technologies like this that will be successful in the long run because you know, they are a gimmick essentially. So the ultimate test for technology for me I sometimes also invest in technology is to say that if technology transcend itself, if it uses itself but goes beyond, to transcend what it does then it's of interest. If it actually goes beyond technology and has a purpose. That's when I'm interested in.

For example I'm really interested how technology can make the world more efficient energy wise to help us reduce costs while we switch to renewable energy, we can solve this problem. We can solve the energy problem by those two things. But just being efficient will not do the job right. We also need to do other things.

So for example you may know a site called Klout which measures how important you are. So I go there every day, no just kidding. But people like the site because you know you put in your Twitter name, your social media and it says oh you, you know, you're rated 72 or whatever. Of course it's a game because you realize you know it's basically – you know, it's just a stupid algorithm. But now you have the first hotels in the world that are saying if you have a Klout score over 60 you get a free upgrade because you're important. Of course nobody knows what the algorithm is. So you can clearly see here that this is a game that is kind of an interesting game but the reality is my Klout score is absolutely not realistic just like how many times I've tweeted is no measurement whatsoever of my value.

It's not even a measurement how many people I have on Twitter that's of value. Let's not confuse the 5% of data that



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we have with the actual reality. Because the reality is much more complex. That's like saying a computer can be my brain. A computer can do a tiny fraction of my brain. Eventually that maybe different. So we should not invest in businesses that will try to replace us by being imperfect and pretending to be real. Now that usually doesn't work.

So other questions?

Participant: Gerd first of all it was great listening to you. The information you gave is very exciting but a bit worrying.

Gerd: Uh-hum.

Participant: On my side.

Gerd: That's what we need.

Participant: Yeah. I want to ask you-

Gerd: More worry.

Participant: - two questions on behalf of parents in this room. First of all, how will we guide our children like you said most of the jobs for them do not exist right now and two, how much time would you allow your children to spend with technology like playing iPad, PlayStation, etc.?

Gerd: Yeah. Well that's a complex question. Let's first talk about worry and you know, basically I think that the way that things change is usually a combination of pain and love. So you're experiencing some pain so therefore you decide I got to do something else. But you also at the same time you have to have an alternative. So this is why it's good to be worried. It's not a bad thing to be worried. If we don't worry, we're not going to do anything. But we also need new things to believe in. So we need both to create both right.

[1:10:45]



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To your question as with regards to kids, right, with my kids, I don't know if I was successful but we'll turn out eventually, I'll show you some pictures but what I try to show them is a discovery process, well how they can discover their future. Because really that's all that matters is that you find a way that fits you and the discovery rather than finding something that's out there that you be fit into. So the important part with education is the discovery process and it's really about discovering what makes you special in the job that you're going to do and create your own job. I mean the other day I have a found a guy, I met a guy whose business it is to keep me private on the Internet. He invented this business. His business is exploding. He's got like 50 employees to keep people from being abused, to keep them private on the internet in all different ways. So this job didn't exist. I would submit to you that I think we're going to see in the next five years that 25% to 30% of people will start their own companies as a result. So we need to teach them how to be independent, to be connected, to be open and to invent themselves, to be more entrepreneurial because that's' very likely going to happen.

So we keep talking until the evening or not just...? Okay. I'm ready to have my kofta.

Gerd:

[Laughs] Yeah. Well that's a very good question. The short answer will be for me if you're talking to a lot of people in business it's exactly the opposite that was required which is not to be emphatic. So I mean it's interesting to see that we're looking for empathy now when until now to be a businessman meant not to have empathy, but to look for profit. So clearly to me the answer is our way forward is to be, have emotional imperfections. To have empathy because the computers don't do it even though I would submit that we'll probably learn a little bit of it like in the movie Her, you know, to simulate us,



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badly of course. But you know, our competency is those things, you know, those things that we can connect to create values. I mean this is where we're going with this. We're not going to beat the machines on all that other stuff. I meant that's just it's already over. So there we have to find a new position that education is really in demand for this, how do you educate people to be creative. I mean empathy, how do you create empathy.

I think in the future, larger money will be spent on teaching people to do that because that's how they create value. But I agree with you, it could very well be that computers will take a piece of that and in the future also take a piece of our jobs as a consequence. You know, I don't really know how that will pan out but that's probably a little bit further away. Again I'm not comparing humans with machines at all. I'm just saying that it's something we have to keep an eye on because what we have today is the world that's becoming more technologized by every second in many different ways and it's not all dangerous but some of it is. Any other questions or comments? You decide.

[1:15:00]

Participant:

Thank you. I will start with a confession. I'm like your mother despite I'm younger than her, I assume.

Gerd:

Okay.

Participant:

I hesitate to use the full 360 Internet world and the digital world just because of the safety reasons that you just mentioned and you all say that it's a risk to be considered. I always have thought it like a door and once you enter, you give your everything to the other part of the world. So far what I have shared through the Internet, I thought it's okay for me to share with the rest of the world population. So how can we balance it just still being part of this world but then still protecting our own confidentiality?



Futurist Speaker Gerd Leonhard

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Gerd:

I'll make a quick answer. I mean my belief is I understand your problem. I have very much the same problem. My belief is that to safeguard us on the digital network, we're going to talk – this is five billion people who have this problem very so and it's not just us. It should not be the job of the individual to figure out how to encrypt their email or you know, most people don't do that. I mean to keep us safe in those things is the job of government, is the job of the companies providing it, that service. It's the job of Google and Facebook and it's the job of the government to figure out how can we be safe and what the rules are. I mean every new technology needs new rules, new norms, new markets. So ultimately it shouldn't be the job of the consumer to figure out how they're going to, I mean you have to be responsible but you can't be responsible for the whole system. Which means that we couldn't use it. So it's a difficult topic clearly there.

One thing that has been discussed I think that would be helpful in this context is to look at something called the global digital rights bill which is about your rights as a citizen of the internet that we're going to see more of.

Anyway so I think we should continue talking outside because lunch is ready? So you can tweet me or email me or you know, find me out there somewhere. Thanks very much for your time.

[applause]

Thank you.

[1:17:22]

End of Audio