THE BROOKINGS INSTITUTION

RIDING THE MOBILE WAVE: THE FUTURE OF MOBILE COMPUTING

A CONVERSATION WITH CEO OF MICROSTRATEGY
MICHAEL SAYLOR

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P R O C E E D I N G S

MR. WEST: Good morning. I'm Darrell West, Vice President of

Governance Studies and director of the Center for Technology Innovation at the

Brookings Institution, and I'd like to welcome you to today's forum on mobile technology.

Mobile devices are transforming our social, economic, and political lives.

I was in Barcelona this spring for the World Mobile Congress, and researchers there

predict that within four years, 80 percent of the broadband subscriptions are going to be

through mobile devices. So, this transition is unfolding at a rapid rate. It's one of the

reasons our Center for Technology Innovation has launched a mobile economy project in

an effort to improve our understanding of how these mobile devices are affecting every

aspect of human existence. We hold quarterly forums as part of this project, and we put

out a number of different reports examining various aspects of mobile technology.

Today we are very pleased to welcome Michael Saylor. He is the

chairman and CEO of MicroStrategy. MicroStrategy is a software company that Michael

founded in 1989. It specializes in business intelligence, enterprise reporting, Dashboard,

and online analytical processing software. He is author of a new book, *The Mobile Wave:*

How Mobile Intelligence Will Change Everything. We actually have copies of the book for

sale in the Brookings bookstore, which is right across the hallway, so any of you

afterwards who would like to purchase a copy, feel free to do so.

The book shows the transformative possibilities of mobile computing and

how it affects fields from education and health care to commerce. It's a great read. I

highly recommend it to all of you.

Michael's going to make some opening remarks about the book, and

then he and I will have a conversation about how mobile computing is affecting business

society and economics, and then we'll have an audience Q&A portion as well. So, please

join me in welcoming Michael to Brookings.

Michael.

MR. SAYLOR: Is this working?

MR. WEST: Yes.

MR. SAYLOR: Yeah, I just have a few thoughts that I'd (inaudible 0:02:15).

The book is about software and its impact on the economy, but I thought I'd make a few geopolitical comments.

From the point of view of a technologist, around 1980 there was a crisis of confidence in America, and, you know, it was probably punctuated by the Iran Embassy debacle. Reagan came to power, and around '80 there was a belief in the country, I think, that we were struggling to compete in the world economy. We thought the Japanese were going to take over many of our facilities. We had movies like *Gung Ho*. They bought the Rockefeller Center. We were concerned that America had lost its economic competitiveness.

Then I think there was an inflection point, and it was driven a lot by the PC revolution and by software. Microsoft was founded in '76; Oracle was founded in '76; Apple Computer was founded in '76 -- three great companies in our time. In 1980, they were just embryonic. They all came public in the later '80s. And something unintended happened. It was that the Western World began to prevail over the rest of the world because of software, and the software advantage was, in large part, due to the branching of the English -- of the language -- the Latin-Roman alphabet versus the pictographic alphabet and kanji and simplified Chinese. And so if you think about the early computers, 8-bit computers and 16-bit computers couldn't process a 25,000-character pictograph language. So, you needed a 26-character language.

And if you ever type on a keyboard -- even today, right? -- We've gone from 8-bit computers and 16-bit computers to 32-bit computers and 64-bit computers. We still don't have any good way to input characters in Japanese or Chinese. Hence, if you want to write software, all the early languages -- Basic, DOS, et cetera -- they're all in English. It was English language companies that were preeminent there.

Imagine what would happen if you were 18 years old and you asked your parents what do I need to do to make money in this society? and they said well, you need to be a computer programmer; and you said okay, I think I'll learn to program computers, and you showed up at college and they said well, before you can learn to program computers, you must first master Japanese? (Laughter) It's a big difficulty, and that's, in fact, the problem, the challenge you face if you live in China or in Japan. At age 18 you must first master English, okay? And, in fact, the great majority of Japanese companies -- in fact, from what I heard anecdotally, one Japanese company programs its own website. The rest actually rely on foreigners to program their websites.

And so starting in the '80s, we started to see things change. Intel was about to go bankrupt. They didn't. They were saved by the microprocessor -- and we know the story of Intel; we know the story of Microsoft with the preeminence of the PC, which lifted Microsoft, Intel, and Dell Computer, and HP and IBM to prominence.

Next we saw the Internet wave of the '90s, and that brought to prominence eBay and Amazon, Netscape and TCP/IP and the Internet and then Wikipedia and Google and Yahoo. Again, no real foreign companies. In fact, as soon as something becomes software, the variable cost of distributing it goes to zero. So, it's expensive to write the first copy; the next copy's a penny, which means if I win the major market for software then I win every other market. And what we've seen in the software industry is there's substantially no successful companies that aren't American. The only

successful company of record in the software industry is SAP, and SAP is run by

Americans and uses English as its primary language and, for all practical purposes, is an

American company. Every other company is an American company that's successful.

This wasn't the case before, but in the year 2000 the most successful

European company was Nokia, a telephone company and a mobile handset company.

Software wasn't a serious component of telephones in the year 2000. Today Nokia is all

but destroyed, unwound for all practical purposes, and it's vanquished by Apple

Computer using software. And software infected the phone. Control of the industry

shifted from Europe back to the U.S. As software infects the tablet computer -- or infects

the tablet -- control of the industry shifts back to the U.S. and in this case to Apple

Computer and potentially to Google.

Software is, in essence, infecting every industry. The mobile wave is

about the impact of that software. About half of the economy is now going to

dematerialize into software -- software running on a handset; this foreign (phonetic

0:07:22) factor? Within five years, there'll be five billion smart phones on the planet, and

that means anything that can dematerialize to this will. And what does that mean? You

start your car with this. You open your house with this. Your passport. Your driver's

license. Your credit card. Your loyalty card. Cash. Just about -- it used to be, for

example, a camera was a product; now it's an icon on the screen. It used to be a video

was a product; now it's an icon on the screen. A video camera used to be a product; now

it's an icon the screen. A tape recorder used to be a product; now it's an icon on the

screen. Well, by the way, it turns out that the tape recorders, cameras used to be made

by the Japanese and the Koreans and the Chinese; now they're icons on the screen.

They're manufactured by someone that actually speaks English that programs.

So, with the unwinding of the hardware industry and the

dematerialization of things we hold in our hand, we should actually see the destruction of traditional manufacturing industries. And, to a great degree, there are three things that take place when something dematerializes. There's the first-order effect, the second-order effect, the third-order effect.

The first-order effect is I take my keys for my car or my house key or my driver's license and it becomes a piece of software on the screen. What's obvious? Well, I can't lose it anymore, right? I've got a hundred credit cards; I've got a hundred loyalty cards; I've got 10 keys; and I've got all my cash on the computer. I can't lose it. I don't have to know where it is. And it's got no weight, no mass, okay? So, that's interesting. By the way, it's hard to steal at that point, right? You steal this, the police can track you within 10 meters. So, as soon as something becomes software, you can't steal it and you can't lose it.

The second-order effect is not software. It's not subject to laws of Newtonian physics. I have a set of car keys in my pocket. I've got one set. That's conservation of mass. I give it you, I don't have it anymore. And so it's a software. I can do this (demonstrating), and I can flick the key to everybody in the room. Now there's a hundred keys. I can flick the key from China to the United States.

Not only can I do that, software is subject to the laws of cyberspace, and therefore the appropriate metaphor is not "Newtonian physics" or "science fiction." The appropriate metaphor is "fantasy." I can cast a spell on the key. I can give you a piece of software that opens -- that actually starts your car, but not if you're drunk. It starts your car, but only during the day. I can give you a learner's key. It starts the car, but only if your parents are in the car. I've got a companion key. It starts the car, but only if you're with one other driver. I can give you a key that lets you drive around New York. You just can't drive to California. (Laughter) So, this is something you can't do with a physical

key. You can do it with a software key, because you can cast a spell on a software key.

People that think in a very fanciful fashion -- this is a benefit of the American culture I think -- they have a benefit in the software business, because they're not constrained by rails, right? And the software won't -- just about anything is possible. This is why the creators at Apple -- you know, it's no surprise, right? That Steve Jobs sponsored Pixar and they made movies, and all of a sudden the guy that makes movies becomes the most successful company in the history of the world, creating software that runs on phones.

There's a third-order effect, and this is one that's not always understood. I'm standing on a beach this summer in the Mediterranean. A guy walks up to me and he goes: I read about your writings and I agree with what you're saying, and I am the largest manufacturer of textbooks in my country. I won't tell you the country, because I don't want to embarrass the guy. But it's not America. He says: I'm the largest manufacturer of textbooks, and the government just put in a tender offer for tablet computers for every student in the school system. What should I do?

Okay, well, for 2000 years people read books on parchment and paper, and the only meaningful change in reading technology came two years ago with the iPad, arguably the Kindle, right? But in the last two years we finally got something that competes favorably with paper. You don't need to read on a piece of paper anymore.

So, I looked at the guy. I said, you know, the first-order impulse would be to chase this technology away, which is go ahead and code all your textbooks into software so they run on those tablet computers -- so you keep that industry or keep that market share. But that's only the first order, a knee-jerk response, and you will fail. You have no chance. And the reason you'll fail is because chemistry and calculus and physics work the same in your country as they work in every other country, right? And

Peru and Turkey and Romania -- chemistry works the same way. And so there's no

marketplace for 200 different local language textbooks to teach chemistry.

The future of learning thermodynamics is I give you the book but the

book's got a simulation in it and you turn a dial and you boil the water. And then you

replace the water with mercury, and then you replace the mercury with ice, and then you

replace the ice with coal, and then you replace the coal with something else, and you do

it in one split second. And that's a pretty interesting thermodynamics textbook. That's

going to all obliterate, right? Whatever you could do. And the bottom line is the entire

local market -- every local textbook manufacturer is going to go obliterate, right?

The local benefits? The fact that you lived in the country? The fact that

you had a local manufacturing plant? The fact that the local union liked you? The fact

that you paid off the local police force? The fact that the local politicians supported you?

And the fact that the local school board mandated your textbook? All that's obliterated,

right?

And so the third impact of software is the formation of global software

networks, because if you can actually trade up -- fill in the blank -- a chemistry textbook

that will educate everybody in America, that means you'll educate everybody in Europe,

right? Because there's one other geopolitical trend I didn't touch on, but it's a very

important one.

It's the formation of the E.U. I'm sitting in Europe this summer and I was

just chatting with someone, and I said, just as an aside, which European country do you

think benefited most from the E.U.? And I caught myself at about 100 milliseconds. I

said, wait a minute, I'm going to answer that question. The greatest beneficiary of the

E.U. was America, because what happened with the formation of the E.U. was the

breakdown of the local customs, the local language, the local sovereignty, the local

economy, and the local currency of 30 different countries, and the French will fight to the

death to defend the French language and the franc. But they're not going to fight to the

death to defend the language of the E.U., which is English, and the currency of the E.U.,

which is the Euro. And the same is true with the Hungarians, the Romanians, the

Germans.

Anywhere you go in the E.U. now, there's a there's a local language

menu and then there's English. As soon as the Europeans decided to trade with each

other, they gave up all their local trade constraints. Then they gave up their local

language, they gave up the local currency, they gave up the local customs. They

adopted, first, the Euro; and as soon as they adopted the Euro people said, as long as

I'm in somebody else's currency I don't control, why don't you split to the dollar? And so

the dollar became the major protocol for the transmission of wealth in the society. I think

it's like 70 percent of all liquid currency.

While the dollar rose the preeminent American law, American customs,

American values, American providers. And so what you've got now is you've got this

billion-person system. There are about a billion people speaking English, spending

dollars, buying technology. If you write a piece of software to open a door, to provide

health care, to identify yourself, to move payments around, to educate someone in

chemistry -- as soon as you write that piece of software, you're going to sell that to a

marketplace of a billion people.

The winner of that marketplace will almost certainly be an American

company, with native English speakers, that understands the American market, because

if you think about it, I mean, what countries actually speak American, speak English,

right? You've got us versus the Canadians, the Australians, and the Brits. And in that

particular case, we're 10X bigger than any of those three countries; and so therefore, it's

always the American provider that wins that ecosystem, and after you win that ecosystem

you win all the E.U., because every single multinational in the E.U. trades in English.

And after you win the E.U., that means you win the Japanese and the Chinese, because

what are they going to do?

I mean, at this point in time you've got a very interesting mobile wave.

The mobile wave, geopolitically speaking, is a wave of software networks running on

smart phones, running on tablet computers; dematerializing everything you read;

dematerializing magazines, books, newspapers, the education system, services, point-of-

sale checkout; underwriting of loans; information provision; entertainment; health care --

all of things dematerializing to software networks. And the most powerful idea in the year

2012 is the global software network.

Yesterday there was a big announcement. How many of you followed it?

Maybe you care, maybe you don't care. The announcement was: "Facebook crossed

one billion people." Okay, by the way, they had 950 million people, like, 12 weeks ago.

Okay, so take your 90-day calendar, take 45 million -- they're clocking 500,000 people a

day adding to the network. So, they crossed one billion people. Google crossed

one billion people.

Okay, what are the chances that any country, any local social network, or

any local search engine has any chance of competing with the economy of scale of a

billion-person software network, right?

The Chinese aren't afraid -- they aren't afraid of any American company,

other than the weapons companies, which they're kind of afraid of. (Laughter) But, yeah,

but they're not afraid of any software company until Google and Facebook, and it's not a

random occurrence that both Google and Facebook are persona non grata in China.

They are afraid of them, because those networks are capable of toppling a government,

right? And we just saw it with the Autumn Rage; we saw it with the Arab Spring; a

network called YouTube; Google Maps, Google Search; Gmail; Facebook. These things

are much more powerful than any software trick or technology trick we came up with,

short of, of course, nuclear weapons and aircraft carriers, but that's old news, right? And

this is the new news.

Now, what are we looking forward to? I think what we're going to see is

the rise of a new set of global software networks, networks that will give you health care,

networks that will navigate your car, networks that will open your door. One day every

door in Europe will get opened by a phone. When that happens, there will be a

technology company behind it. It will be an American technology company. And one of

two things will happen. Either the network that actually opens the door will be sitting in

America or it will be sitting in a data center in the E.U. controlled by the American

company; or it will be an American company that sold the software that got configured in

some local country.

But at the end of the day, it's clear that the American economy has an

incredible economic edge and technical edge, and American technical protocols,

American services, American markets, American languages are preeminent.

If you're a six-year-old child in Pakistan with a $300 tablet computer,

within a few years you'll be able to learn any of the hundred languages for free without

the permission of your parents or the local politician or the local religious leader. And

when you have that choice, what language are you going to learn, right? If you learn

English -- everything you sell in English sells at a higher price to a larger market.

Everything you buy in English comes at a lower cost with more liquidity. Every question

you ask in English you get the answer back quicker, more accurately, for less, right?

There's a cost to disconnect yourself from the mobile ecosystem, right?

In North Korea if you disconnect yourself, you don't have Google Maps, you don't have Google Street View, you don't have Wikipedia, right? Any query on Google on a proper noun, you get a Wikipedia response. In essence, it's getting more and more expensive to not be plugged into that network, and the price is only going to go up, because right now you've got a billion-person network that lets you share photos, that lets you answer questions. And these are actually, in the greater scheme of things, fairly trivial software functions.

What happens when you have a billion people on a health care network and it keeps you alive? What happens when you have a billion people on a security network and it allows you to fight crime or keeps a criminal from taking advantage of you or a billion people on a notary network or some kind of payment securities network? At that point, you can't be cut off from the network. You might as well lobotomize yourself or put blinders on.

So, we're going to see countries, including China, drag kicking and screaming into this particular ecosystem, because you can't stop it.

I'll stop with one last point, which is Facebook went from five million or six million users to 65 million users in China over the last three years while it was illegal. Now how powerful is that for a business model when you gain 60 million customers in an illegal setting? And that just shows the power of the mobile wave.

MR. WEST: Okay, great. Thank you very much.

I appreciate your history of technology, because I have lived through this revolution. I remember many years ago when I was writing my dissertation, I did so on a typewriter. And then I have gone through mainframes, personal computers, laptops, tablets, and now smart phones. So, I certainly, just based on my own experience, appreciate the technology revolution through which we have gone through.

The book I thought was fascinating and kind of getting into the impact of mobile technology in a lot of different areas. I want to ask you about the subtitle of your book, though, because you talk about how mobile intelligence will change everything. Explain this concept of mobile intelligence and what you mean by it.

MR. SAYLOR: Well, really, I'm using intelligence as synonymous with software, but active software. Software running on the PC is like solid state. You had to go to it. And it's not mobile. It's a fix. You have to go to a cubicle. You have to go to an office. And the fourth wave of computing was the Internet wave. The third way was the PC wave. But -- and the fourth wave got about 350 million people that were working on software about three hours a week in their cubicle that are white collar workers between the ages of 20 and 45 in the Western world. And you probably needed $25,000 worth of infrastructure to use that. So, it's software that's not -- it's not that good, and it's working 15 hours a week on a set of people.

The fifth wave of computing is the mobile wave, and mobile software running on a phone or a tablet computer is going to five billion people 150 hours a week. And you don't need $25,000 worth of infrastructure; you need, maybe, $200 or $300 worth of infrastructure.

So, we see software going from solid state to vapor state, right? And vapor -- it becomes -- it just dissipates, and it's all around us, it's in our clothing, it's in our lives. Software can wake you up in the middle of the night. People sleep next to their phones, and the phone is running software, and when the phone starts to beep and vibrate and make noise, then that's truly mobile intelligence, right? because now the software makes us intelligent. The software makes us intelligent, but if it's not on us, right? If it's not hooked to us all the time, if it's not mobile, then it's not permeating our lives. So, mobile intelligence is really just a discussion of what happens when software

changes the behavior of five billion people.

And I guess a good example would be, you know, you use software to navigate, right? Who gets lost anymore? If you've got a phone, you're running Google Maps on it, that's truly mobile intelligence. Ten years ago we carried around physical maps. We got lost all the time. Now, if you have a smart phone, it's kind of hard to figure out how to get lost, you know? In fact, I've got a program, "What's Up?" I can sit here right now; I can go and I can type to someone "Come see me." I can punch a button; it will GPS locate me, put me on a map, and zap the map to them. And you've got to be an idiot to not be able to find me, right? (Laughter) So, that is the intelligence to be able to -- how many people could, 10 years ago, recite in a hundred milliseconds their GPS coordinates, right? I mean, you could say what, are you stupid? Ten years ago you can't recite your latitude and longitude to minutes and seconds. Today, everybody can. Well, at least everybody that's got an iPhone or an Android phone can just with the right software.

So, I just see we have become so much more intelligent and be able to fetch that. I can fetch that coordinate, and I can project that to as many people as I want instantly. And so, in a way, the software makes us superhuman in our intelligence.

There's an author, Arthur C. Clarke, right? And he's very famous for a quote. I put it on the back cover of my prospectus when the company became public in 1998. And the quote, which I think is wonderful, is "Any sufficiently advanced technology is indistinguishable from magic." (Laughter) And so if you don't understand it, it's magic.

Ten years ago if you looked at me -- if you were a mile away and you said "So, where are you?" and if I rattled off my latitude and longitude perfectly and then I telegraphed it or if I telepathed it, right? Through space to you, you would say that's a magical person. And today you would say that just a person with an iPhone. (Laughter)

Right? That's why you need to get the iPhone. And that's what I mean when I say

mobile intelligence is changing everything.

MR. WEST: Okay, in your book you also write, "Mobile computing is

different not just smaller." And I think that's an important insight that a lot of people miss,

because they look at a smart phone and they think it's just a smaller version of everything

that we had previously. You obviously -- I think that's not the case, so what do you mean

by that?

MR. SAYLOR: It goes back to my point on my first-order effect and my

second-order effect, you know? The first-order effect is I put the software on the smart

phone instead of on the PC in the office, and even then, you know, I just convert to

software.

You know, a brilliant physicist would say you can throw a baseball

30 feet through water, and you can through a baseball 300 feet through air; you can

throw a baseball 300 million miles through space. And if they're really smart, they

calculate the ballistic trajectory and take into account all the foreign gravitational objects

on the trajectory of the baseball. But that's all Newtonian physics, and that's very linear

thinking.

And, on the other hand, software running on a smart phone is subject to

laws of cyberspace. So, a software person would say I throw a baseball into cyberspace

and it becomes a beach ball, and then it becomes 10 chocolate balls, and then it

becomes a birthday cake, and then it morphs into a wedding cake, and then a beautiful

woman jumps out of the wedding cake and I marry her. (Laughter) That's how a

software person thinks, right? They're not constrained by anything that looks like

Newtonian physics.

And this is why the traditionalists will fail in the software business -- the

traditional banker, the traditional health care provider -- they will fail, and this is why the Googles and the Apples succeed, because as soon as I conceptualize a credit card as a piece of software, all of a sudden I figure I've got a credit card, now I can give five software credit cards to my five children, now I can give a software credit card to my son but his doesn't buy alcohol. And I can give a software credit card to my daughter; it only works on campus, because I don't want her taking a road trip with her boyfriend off to Vegas, you know? Plastic cards don't have those constraints. Software credit cards do. Now I can go to the mall with 20 kids in the Girl Scout troop and I can flick 20 credit cards them good for lunch up to $15 each. They can go to any of the restaurants in the food court, spend the money, and whatever they don't spend comes back to me two hours from now, right? That's how a software person thinks about a credit card, right? If the conventional thinker puts the American Express card on the phone and all it does is what the plastic card did, they will surely fail.

MR. WEST: So, you mentioned Facebook and it crossing one billion users. A lot of businesses, including Facebook, have had difficulty navigating this transition to the mobile world. Why do you think this migration is challenging for so many businesses, and why are so many businesses are having difficulty with this?

MR. SAYLOR: Well, generally, any successful business is an organizational structure built in a certain legal environment and a certain physical environment and a certain competitiveness environment and a certain customary market environment. And it's the genetic winner of the competition throughout time in that particular ecosystem, and so it probably represents the best thinking of some hardworking, focused person; hence, like, the *New York Times* rises to preeminence.

It's the best example of a newspaper in the largest media market for English-language newspapers in America. We remember it. There were lots of other

newspapers in New York. They failed. There are lots of newspapers in the rest of the

country. They didn't rise to the same prominence as the *New York Times*. But as of the

year 2010, everybody wanted to read a newspaper in print ink. To ship two million copies

of the *New York Times* cost $230 million. It's a variable cost. Once you know there's a

variable cost of a hundred dollars a year per subscriber, then it dictates you must behave

in a certain way. The *New York Times* has a printing press, has a lot of capital, has a

union to deal with or many unions to deal with, it has New York City, it has trucks, it has a

distribution network of magazine stands, it has a way of selling advertising. That was all

finely tuned over the course of a hundred years in a certain way.

Now, that's all obliterated, right? The impact of the union, the printing

plant, the capital, the paper -- the *New York Times* owns a newsprint or a newspaper -- a

paper company, right? They were backward integrated into their own supply, because

that sense. None of those things matter anymore, right? And in truth, the mayor of

New York doesn't matter anymore to the *New York Times*.

We're moving toward a world of five billion people that read on a tablet

computer. Within 10 years I believe there will be 10 billion tablet computers. There are

five billion, six billion people that will be reading, but tablet computers will be in your hotel

room, the point of sale, in your office place; they'll be in buses, trains, boats, planes.

They're a vocational instrument.

So, within 10 years, you've got everybody on the planet reading on a

tablet computer. Now the variable costs of reading a newspaper went to zero. Now if

you're an English-language newspaper publishing national news, your natural audience

is at least a billion people. If you believe what I just said, we're going toward five billion

people, I think. Everybody who is a knowledge worker is going to be sought into the

English-language. It will become the Latin of the mobile era.

In that case, you can't afford to have a natural circulation of two million. And so you've got to basically lose all of your foolish consistencies; or, in this case, every brilliant insight that was developed by the person you respect in the previous generation now has to be questioned, because if the guy that won the marketplace battle a hundred years ago was alive today, he or she wouldn't do it the same way, right?

And this is the problem with traditionalists. They adhere to tradition, and what they forget is that the guy or the person they respect was probably breaking every tradition in their time frame in order to win the marketplace, and if they were alive today, they would be breaking those norms again. So, there is no good business strategy for growth other than technology.

And Nokia was a company that operated lumber mills in the middle 1800s, and for 150 years the people that ran it thought they were going to invent a new technology, go into new markets. And then sometime 10 years ago the people running the company forgot that that was the secret of the company's success, and rather than moving forward and embracing software and becoming the best provider of software for phones in the world, they actually moved the opposite direction. They under-committed Symbian. And then when Steven Alop took over the company, he abandoned Symbian, basically abandoned the software and at that point put a stake in the heart of his own company, which was on the downhill slide from that point.

So, I think -- hopefully, that answers your question.

MR. WEST: Yup. Let me ask you about identity theft, because you're mentioning that mobile devices are going to have your credit card capability or its mobile payment equivalent, passport, house keys, car keys, and so on. There was a *Time* magazine wireless survey or survey of wireless users that just came out about a month ago, and it found only 29 percent of smart phone users actually have passwords. So, the

question is, if we add all these new applications onto mobile devices, and many people keep their front door unlocked, isn't this a recipe for grand larceny?

MR. SAYLOR: Yeah, I think that would be a pain of someone that doesn't understand technology and/or is afraid of technology or just, you know, is afraid of the future. And as is typical, it's exactly the opposite that's true.

As soon as software -- as soon as these things dematerialize to software, then it becomes a hundred times harder to steal anything. There's $220 billion of credit card fraud in the world today, 220 billion a year. Let's think about that for example. I have a credit card. If you see my number, you could pick up the phone and dial in and try to order something using the credit card number, right? There's a special up-charge called "Card not present." If you're doing a credit card transaction but the card is not present at the time, normally the credit card company charges you, like, an extra percent or 2 percent, because the fraud rate is so high. If I got your phone, if I got your credit card number, I could just blast it out to a bunch of hackers and they could run up a hundred thousand charges simultaneously with "Card not present." This is a danger.

Credit cards are trying to defeat that by putting a security number on the card, so you actually have the card, you flip over, you read the security code, which is a three-digit code on a Visa, it's a four-digit code on the AmEx. It's static. It's static for the life of the card. A good idea except for the fact that if you walk into any bar at 2 a.m. in the morning and you'll see there's a stack of credit cards about that high. People left their credit cards. People leave millions of credit cards a week in bars and restaurants. Millions a week, okay? How hard is it to come up with a stolen credit card? Not at all. So, I can call in and give the security code. We still don't have any kind of security there, hence, massive credit card fraud.

Now, what happens if I put the credit card on a phone? Well, here's an

example of mobile identity. This is a product we have. It's called Usher. And I put my

employee ID or an employee ID on the phone, called it "credit card," right? And when I

do that, I could actually have -- I don't know if you can see it, but I can have a bar code

here, and you can go and you scan and validate the credit card bar code with any other

phone, and you can check with a server to see whether or not the card is valid or stolen,

and of course you could revoke it.

Now, this is not revolutionary. What's interesting, what is revolutionary is

that I can flip this thing and I can generate a four-digit security code. We call it an Usher

code. This one is 1815. That code is good for one minute, 51 seconds. You can't see --

there's a clock here, but I take that 1815 -- I can take any phone on the planet and I could

type in 1815, and that will actually fetch my credential off of a network or an encrypted

network over a phone line.

What does that mean? It means I could call from Singapore to a banker

in New York City and I could say move a million dollars on my authorization. He could

say who are you? I'd say I'm Michael Saylor. He'd say what's your authorization? I'd

say 1815. He types in 1815 and we've got a perfect mobile signature where I, in

essence, sent my passport through the phone line. It says Michael Saylor, this latitude

and longitude, at this Greenwich Mean Time, fetched a digital signature, a permission,

because he's authorized to do it; and this banker on the other end received the digital

signature. And so we've got the party, the counterparty.

And it's almost impossible to fraud. You steal this phone, right? It's

impossible to steal a mobile phone without the complicity of the government and the

phone company, right? Have you ever used the feature Find My iPhone? You can find

your iPhone to within 10 meters any time you want.

It's flabbergasting to me that anybody steals any phone. There's a

unique device identifier inside this phone. If Verizon or AT&T wanted to lock that down completely, then anybody that steals a phone would basically be stealing a homing beacon to bring the police to them as soon as they turn on the phone. They just show up at the door. It's impossible to steal anything that's actually sitting on a network device.

So, at this point people may not lock their phone, but it's simple. You put a four-digit PIN on the phone, and then the phone is as secure as your cash card, right? And people use cash cards. If you actually put an infrared filter on top of this camera, which is about to happen in the next generation of phones, you just hold it like that and it'll do a retina scan. It becomes utterly impossible to steal a phone.

But even right now, you can use voice authentication and a single PIN to make it impossible to open or crack the device. Should you steal it, you can only hold it until the police show up at your house to pick it up, right?

And that being the case, the phone itself is secure. When the credential -- when the credit card goes on the phone, you would obliterate $200 billion worth of credit card theft per year, okay? That's one issue.

You know, I talk to people all the time. A girl comes to New York City. She's a student, and she's working at a restaurant. I say, well, how are you doing? You're on a student visa, right? She goes, yeah. I say, so -- well, don't they ask for your Social Security Number? She says, yeah, I just give them my roommate's. (Laughter)

You know, there are 20 million organizations -- 20 million organizations (emphasizing) -- with obsolete, ineffective identification systems in the world. The most ineffective, right? Is the American Social Security Card, which is a name and a number, right? Followed closely by a UCLA student ID, which is a picture and a name on a laminated piece of paper. I can Photoshop snapshot those things and pound out a hundred counterfeit of those things and use them forever.

The other extreme is the United Arab Emirates National Citizen card, which is a plastic chip card keyed to your DNA, retina scan, blood test, et cetera, on a computer system. But, you know, the best in the world -- you know, the best in the world, which is similar, by the way, to the Saudi National ID card -- on the back of it, it says "It is illegal to take this out of the country." Think about that. If you take it out of the country and you lose it within two weeks, you must report it to the government. Now, why? Because you can't revoke or track a plastic card moving through space.

If I'm a policeman, I can flash my badge outside of my precinct off of hours and use it to gain entry to your house. I can flash my badge to walk into the Verizon Center. My boss doesn't know that I'm abusing my power as a cop. You know, I could be in California and flash a D.C. badge and probably get away with it. I could certainly flash one outside of my time zone.

So, existing credentials, existing credentials, existing badges -- you can't track them, you can't revoke them, you can't monitor them, you can't condition them. As soon as those things become a piece of software, you can do all of that. And in this particular case, you know, with software I could -- I can take a piece of paper, I can write "$5,000," I can take a photo of it, I could take a photo of you. I can hit "sign." I can create a signature, 3822. I could, say, go to the bank and just tell them Saylor gave you a check 3822.

MR. WEST: Could we check this hypothesis? (Laughter)

MR. SAYLOR: You should ask me to put more money on the check before you do that. (Laughter)

When you walk into the bank, you say "3822." The bank just types "3822" on a phone. They see your photo, my photo, the check. What I just gave you was a certified check. It's better than a real certified check and a passport, right? It's more

secure than that. In fact, you're better off to have something digitally signed on a mobile

device than to walk into a bank with two forms of ID and a check.

And so I think when you start to apply this to everything, right? -- Social

Security -- I can take your health care card from United Health Care, I can go into a

hospital, I get a hundred thousand dollars worth of health care, right? They're not going

to check.

And, so there's endemic fraud in the health care system, in the credit

card system, in the tax system of every country on earth. And if you were to add that up,

that's probably got to go to a trillion dollars a year. So, people, if they sit around and

they're, like, how are you going to afford this stuff? The phone is only $500 at retail, right?

You couldn't give away 2 billion per year, right? On the savings from the phone. And you

think people don't care? The Italians care, right? The joke in Italy is nobody pays taxes

south of Rome, right? And, you know, if you look -- the Greeks care. The Greek

government cares, right? They had a tax on swimming pools, and I remember in the last

crisis they flew an airplane over everybody's house in Athens and they determined that

3 percent of the population was complying with the tax.

So, for the most part, when you look at homeland security, when you

look at tax, when you look at health care, when you look at government services, when

you look at bank fraud, when you look at any kind of trade and logistics, they all have

endemic inefficiencies in them. All of those things are ready to be obliterated by mobile

software in the coming 10 years.

MR. WEST: Okay, let's open the floor to questions from the audience.

There's a question in the very back. There's a microphone that will come over to you. If

you could give us your name and organization, and we'd ask you to keep your question

brief as well.

MR. CEREGHINO: My name is Larry Cereghino, Falls Church, Virginia.

Interested in your -- what you feel are the implications for kind of physical neurology, the cyborg kind of effect with your software concepts and, on the other end of the spectrum, your thoughts on the physical device issues, then. Who makes money? Somebody's got to make these tablets, your phone you're holding, and the rest.

So, there are two aspects of this that I find intriguing in your thoughts.

MR. SAYLOR: Well, I think mobile software is becoming more and more part of our clothing, and so there are fascinating things going on in the health care business. Now, there are, for example, extensions that will take your blood pressure that you just plug into an iPhone, okay? So, for the longest time people went to a doctor's office to have their blood pressure taken and to gather medical telemetry. We're looking at things where you could do a saliva scan, you could do a blood test, you could do blood pressure, you could take all sorts of other medical telemetry, and you can plug it right in to your smart phone -- and then your heartbeat, you know, for monitoring for arrhythmias, et cetera, and cardiac arrest, especially in people with heart problems.

I think you'll see more and more of those devices that will be commercialized. I mean, take something as simple as, you know, the Nike monitor they put into your shoes and you just hit the monitor when you're running and it integrates with an iPhone so you have time and distance of your workouts.

So, I think there is a great opportunity in the marketplace for telemetry devices in health and medicine; and you've now got a local processor in your pocket, even a local radio, and you've got to be able to form that network. And, remember what I was saying, the most powerful idea is a software application network or a software network that's worldwide so, you know, someone can form a network that actually monitors cardiac patients. So, if you're going to monitor a cardiac patient in the U.S., why

not monitor a cardiac patient in India, China, Pakistan, wherever?

I think that it's an embryonic market, but if you start to scan for peripherals, they're evolving, and as the functionality of the phones improves, you know, as the cameras get better, you know, as the GPS chips get better, as the gyro compasses get better, as the fingerprint sensors get better, right? They'll be able to do more. So, I think that's an exciting area.

And as for the second piece, which is device manufacturers -- who wins? Look, clearly right now what's interesting is not who manufactures the device but who controls the software that gives form and function, that gives intelligence to the device. So, the devices themselves are manufactured in China or they're manufactured in Korea, right? And, you know, if you look at Apple, it says "engineered in California, made in China."

And what's the impact of that? Well, Apple has generated a $650 billion market cap, which means there are 5 to 10 million Americans that will live middle-class lives forever, based upon the success of that company in the past 10 years to the extent that it is not demolished by trade restrictions, right? And there are probably 10 million Chinese that also have been elevated into the middle class because of that one company. So, you're looking at a very interesting trade dynamic, which is an American company has a device manufactured in the Far East.

This is not rocket science. There are 700 million Chinese peasants, right? So, what do they do well? They do hard work well, and they do it for a low price. Nobody in America -- we don't have 700 million peasants in America, nor does anybody want to be a peasant, and so people don't want to work that hard. I don't want to work that hard, right? Nobody wants to work that hard in America. In the ideal world, you want to actually think about something and have someone else do the hard work and you want

to get rich off of it.

So, in this particular case, Google has been a beneficiary of this. I mean, Google is coming out with their tablet. Amazon just came out with the Kindle Fire. Most of those devices are all being manufactured by component manufacturers somewhere in the Far East where they have large pools of hardworking, disciplined labor. Then they're branded and they're imbued with characteristics of American software companies, and they become valuable. And then the day (phonetic 0:48:52) the winners will be, right? It will be Apple, Amazon, Google, right? There will be companies like Samson and FoxConn that will actually make money. They'll be the suppliers. They won't be the biggest winners; they'll be second-order winners. The global middle class will be a big winner, because 20 million people will be in it that weren't in it before, and that will increment it 5 or 10 million per year as long as that free trade continues.

And as software -- and the losers? The losers will be people that manufacture goods or services that don't have software in them the traditional way, which means local newspapers; it means companies that manufacture television sets in Japan, right? -- the Sharps, the Sonys, the Panasonics. To the extent that they're manufacturing a stupid device, like an old -- a line device, those are being obliterated, all right?

I have two degrees from MIT, and I can't get my television to work in my house. (Laughter) I've been in the software business for 20 years, right? I have a Sony television. I have a cable box. I have a DVD player. I have an Apple TV thing. I have seven remote controls. (Laughter) I have a Bose surround-sound stereo. I have seven remote controls. I can't get it to work. (Laughter) I could spend 30,000 -- I shit you not (laughter) -- $30,000 a year on consultants, AV consultants, to wire it all up. It breaks. I send them back. They spend three days; give me another bill for a thousand dollars. I can't get it to work. The point is it's just too complicated.

Here's what's going to happen next. Apple is going to create an Apple television. It will be a big box. You'll put it on the wall. There will be no remote control. There will probably just be a power plug. You'll plug it into the wall, it's got power. It'll have a Wi-Fi chip in it. It'll have the IOS software in it. I will take out my phone. I will download a thing called "remote," which is already on my phone, I will punch it, and it will work. And I just -- and I don't want anything else, right?

So, at some point what happens is, you know, the Sharps that used to have their own brand, now they'll actually manufacture components for Apple, and the brand will shift to Apple.

In an industry that was commodity -- you know, the phone was commodity. A feature phone was 50 bucks before the Apple came along. Now people pay $800, you know, for an iPhone. The tablet was commodity. It was a $3 piece of paper. Now people pay $600 for a tablet computer. The television is, today, a commodity, because it's so stinking hard to use, right? And it has so little functionality. But the television of the future or the projector has a place. It has a place in a meeting room, a board room, a conference room, a living room, and a classroom. We will see large screens in all those places. They will all be running software, probably Android or the IOS, and it will be Apple, or it will be Google, or it will be another American company that controls it, and the price will go up, and the thing will do a hundred-X more than it does today, right?

We're moving toward a world where you put a big projector in the classroom, you flip on your phone -- you can do it today, you can flip on a phone, you can call up Kahn Academy on algebra, go "click," the guy starts giving a lecture. You have a question about cancer, "click," he starts telling you about cancer. How do you build a bridge? "Click." We're talking about bridges. You want to know what the human

anatomy is? "Click." Three-dimensional model of the human anatomy. You want to see

the shoulder? "Click." Here's a shoulder. You can rotate it, you can spin it, you can cut

it, you can see every single ligament of it, some guy will talk to you about it.

I can be an 18-year-old high school senior. I can teach the class. I can

teach the class with the software. It will be a phone in my pocket. It will be something

projecting on a wall. It will be an 80-inch television. It won't be manufactured by any

traditional manufacturer. It will be branded and controlled by an American technology

company, and we will be delighted by it.

MR. WEST: Okay, over here, there's a question -- this gentleman.

MR. BARNES: Yes, Donald Barnes from Guangxi University in China.

Most of us watched the debate the other night. There's a lot of

discussion about the local economy and how manufacturing jobs are leaving this country.

What's your reaction to that type of discussion in today's world?

MR. SAYLOR: You know, I'm not a Democrat and I'm not a Republican.

I'm closer to Libertarian. I'm probably a Libertarian/technologist, right? (Laughter) But

my reaction is, you know, I see the Republicans rail about the Chinese dumping, and I

cringe; and I see the Democrats try to be even more anti-Chinese and I cringe some

more. It's like they're both trying to, you know, be more against free trade and outdo

each other.

But I make the simple observation, which anybody that's a student of

history would know. In 1850, 67 percent of all jobs and all economic activity in the

United States of America was agriculture, which meant in the middle of that century we

spent two-thirds of our waking time of the entire civilization to avoid starving to death.

And the other one-third was devoted to inventing things to make the civilization move

forward. So, we had one-third of time to educate ourselves or entertain ourselves or cure

ourselves of disease or to enlighten ourselves or to invent. And two-thirds -- we just tried not to starve.

And today 1.8 percent of the economy is agriculture; 65 percent of all of our energy has been freed up to do something else, and I would dare say every single person in the room does something other than they would have been doing in 1850, and all of your jobs would be obliterated had we not had technology to automate agriculture. And, at the same time, probably in 1850 there was somebody sitting around saying we can't allow those agricultural technology machines to come into the economy. It's going to eliminate jobs. Right? And I think it's just the most silly notion imaginable, and I'm sure that politicians -- they won't get it.

But here's the problem. At the end of the day, how do we teach algebra? We teach algebra by: I stand in a classroom. I have 25 people. I teach algebra to 30 people, first period; second period, I teach algebra again; third period, I teach algebra again; fourth period, I'm exhausted -- I take a lunch break; fifth period, I teach algebra again; sixth period, I teach algebra again. I go home, I'm exhausted. It's really tiring to speak six hours in a row to a bunch of 14-year-old kids. And, you know what? They never get any better, because next semester I've got to do it again, and next year they all just get stupider, and in the same way I start all over again. (Laughter) And I have to do that 30 years in a row and I basically have 30 years worth of ignorant kids that I have to make less ignorant at the cost of what --500,000 people in the world have to do that 30 years in a row? And how long do you think we've been doing it that way? We had algebra 2,000 years ago. We've been doing it that way for 2,000 years. We basically have been going through the same motion for 2,000 years without progress.

Now, here's the issue. What do you think will drive the civilization forward? What are you afraid of? I'm afraid of strains of bacteria that are resistant to

penicillin, amoxicillin, and azithromycin. That's what I'm afraid of. We're afraid of super

bugs. I'm afraid a meteor might strike the earth. I'm afraid of global warming. I'm afraid

we'll never find a way to get to Mars. I'm afraid that inefficient engines are going to

pollute the atmosphere, right? I'm afraid of cars that will smash into me and planes that

will crash to the earth. I'm afraid of terrorist bombs. I'm afraid of a lot of things. I'm not

afraid that we don't know algebra.

Okay, so how are we going to actually cure cancer, prevent heart

disease, and build a plane that will fly from here to China on one pound of fuel? Are we

going to do that with algebra? Okay, algebra's not enough, right? And all the algebra

teachers in the world are not going to do that, because they're busy teaching algebra,

right? They're digging ditches, they're digging holes in the backyard, and they're moving

it to here, and they're picking up the dirt, and they're moving it back to there over and

over, back and forth. They'll do that for a million years and they're not going to cure

cancer, and they're not going to invent a new type of jet fuel or a new type of jet engine.

And, by the way, as an aside, we haven't had a meaningful advance in

aerospace engineering for 40 years. The 737, the 747 -- they were engineered in the

1960s. A G5 is based on a G4 is based on a G3 is based on a G2 is based on the

fuselage of a G1. The G2 was designed (inaudible 0:57:55) in the late 1960s. So, that

entire industry has moved forward 10 to 15 percent in 40 years. We're trapped, right?

The space shuttle, designed in the late '60s, early '70s. We're just trapped in lots of

areas of technology. The civilization is stuck.

And what do we need to move forward? We need to eliminate every one

of those jobs. We need to eliminate all the algebra teacher jobs. Instead of 500,000

average algebra teachers, we need one good algebra teacher. We need that algebra

teacher to create software, videotape himself, answer every question, create simulations,

let the computer, the iPad teach you algebra, right? You can be charismatic. Once we

have the one algebra teacher, 499,000 algebra teachers have a lot of free time on their

hands. They can actually go and get a master's degree in computer science, or they can

learn medicine, and then they get a PhD in chemistry, physics, thermodynamics,

calculus, biology -- something -- and then maybe they'll go and work on a new type of

amoxicillin or a new antibiotic or a way to cure cancer, or maybe they'll invent a new

engine, or they'll create a cold fusion device or a new radio or a new algorithm for moving

data through space. Every single job we have in this country other than a farm job

probably was a result of the destruction of jobs due to technology. And in this particular

case, I think when the reflexive answer is we can't do that because that will destroy jobs,

that's kind of a reflexive answer of we want to stay as inefficient as we have been in the

history of civilization and we don't want to get more efficient, so please don't change the

world for the better.

If I invented a box, right? -- If I invented a box this big that provided

infinite energy for your home and your car and your airplane, right? I would destroy -- I

would obliterate hundreds of millions of jobs. And would the world be a better place or a

worse place if energy was free and infinite? And I think the obvious answer is it would be

a better place. And yet it would destroy jobs. In fact, the hallmark of any good

technology is it destroys jobs. But at the end of the day, destroying jobs is -- another

euphemism for destroying jobs is I just give people infinite free money, all right?

And what we do with that productivity is a political question, right? How

do we redistribute all that productivity or all that discretionary income? That's a political

question, which I will not opine on, right? But, as a technologist I will say I would rather

have a world where we produced everything that we currently need today with 5 percent

of our time, and 95 percent of our time we spend educating ourselves in a new form of

science or math or technique so as to invent a way to live longer or invent a way to go

further or invent a way to enjoy ourselves more. That's a technologist's credo.

MR. WEST: So, I grew up on a farm outside Dayton, Ohio, so I

appreciate this transition away from agriculture. (Laughter) It's much more fun sitting in

an office with a computer.

MR. SAYLOR: By the way, I went to Fairborn High School. I grew up

outside (inaudible 1:01:11 -- overtalking) neighbors.

MR. WEST: (Inaudible 1:01:10 -- overtalking) Ohio.

You had a question in the front row? There's a microphone coming up to

you.

MR. BRUCHEY: I'm Bob Bruchey. I'm a consultant.

How can we extend your mobile network to include meetings of lots of

people putting up their money and getting a decision on what they're going to do in their

project?

MR. SAYLOR: I think it's happening right now with LinkedIn and

Facebook, and Google Plus and other types of forums. In fact, it's happening -- if you

look at the formation of global markets, eBay is a global market, right? If I want to sell

something or buy something. So, I think we'll see the formation of many, many more

global markets for goods and services. I think we'll see the formation of global markets of

capital for insurance underwriting or financing. Banking and insurance has traditionally

been local. There's no reason it needs to be. You know, there'll be a rise in micro-

finance.

Right now it's hard to project or to underwrite something, because we

don't have the local information. But in a world where I can just take my phone, take a

snapshot of my car, then maybe I can have my car insured in South Africa by a company

in Chicago, right? And so I am excited about that.

I just think -- I think we'll -- in order to get to that place; we need to move people's physical identity and political identity and economic identity and professional identity into cyberspace, right? So, one of the core interesting dynamics or energy-creating dynamics is a point in which I affix my passport to my smart phone. Now, I can project my political identity with credibility through the phone. At that point, there's a legitimacy.

The problem on the Yahoo forums was always -- there's a forum, we talk about stocks, and some guy named Yo-Yo-Robot 4 says, that stock sucks; and some guy named Daffy Duck says, no, that stock's good; and some guy goes -- you know, named Wild Bill Hickok -- says no, you're both idiots, all right? And so you've got three random avatars, and they're not legitimate people, and so they say stupid things to each other and they're disrespectful and they're rude and they lie with impunity, because there are no legal consequences and there are no society consequences.

If, in fact, I had a credit reference and I had a political reference, you know, if I saw something posted -- Warren Buffet, who has $10 billion, you know, invested in this stock, made the following observation -- that becomes a more interesting forum, right? At the point that you have to speak as yourself, right?

One of the great breakthroughs of Facebook was they had a rule: You're not allowed to be a fake person. Right? You couldn't create a fake person. They used to say about the other social networks: Well, they failed, because people were something that they weren't, right? And people would go on cyberspace to be someone that they're not, whereas they went on Facebook to be someone that they were, all right?

So, at the point that you enforce rules of identity and propriety and civility, right? and legality in cyberspace, you can actually form a mobile market with

liquidity, which might bring together people from 10 different geographic jurisdictions in real time who can form trusted relationships, right? I can't trust you if there are no legal, ethical consequences to your misbehavior, right? And so I don't think we're quite there yet, right? The Facebook rule is you're supposed to be who you are, but the way you'll know you're there is when you get your driver's license and your passport issued to your smart phone by the government.

When you have five billion people on Facebook that also have five billion passports, that have five billion bank references, right? when you've got a credit reference, a political reference, and a social reference, at that point, then, the amount of information you have about anybody goes up -- well, the liquidity goes up by a factor of a million, right? At that point, you can actually form trusted network relationships a million times faster. Then you'll see very interesting economic creatures and professional creatures that will form in this new form of cyberspace.

MR. WEST: Right there, there's a woman who has her hand up. Actually, the person right next to you. Yes, the woman in the sweater.

MS. FEDERMAN: Heather Federman with the Future of Privacy Forum. There's a lot of information that's on our phones currently that will be on our phones, based off your discussion. Isn't this just synonymous with the telescreen? Don't we have cause for alarm with all the aggregation data, walking around like this every day from the moment we're basically born till we die?

MR. SAYLOR: You know, I would say, as a technologist, it would be idealistic and foolish to think that technology can't hurt us. Generally, the theme that you see with technology -- and I'm a student of history of science, so I think about automotive technology, train -- what's a train? Is train good for the civilization? Yes. What's the euphemism for real pain? A train wreck. Right? So, we talk about that's a train wreck?

By the way, you never want to be in a train wreck. That is cause for alarm. A train wreck? Take trains away? Take your country away. There is no country without the train system. But, trains cause train wrecks.

What's the leading cause of death for people under the age of 60? Automobile wrecks, okay? Take automobiles away, that's -- try to take automobiles away, right?

So, I would say 95 percent of what technology brings us is good, 5 percent of what it brings us is bad. There's a place in the legal system and in the political forum to debate and discuss ways to protect ourselves from train wrecks and automobile wrecks. There are traffic laws. I'm all in favor of traffic laws.

I'm in favor of laws that prevent people from utilizing mobile technology to wreck your life, right? I don't want 16-year-old guys who take pictures of people in the locker room and then upload them to Facebook and then let them go viral on YouTube, right? Nobody wants -- I don't want you to sit at -- we're in a public forum, right? And I'm public.

On the other hand, if you put a video camera on me and you go through every frame, you'll probably find a frame of me scratching my crotch or picking my nose or something like that. I don't think you want to be able to take that image and upload to 10 million people on the front page of a newspaper so as to disparage my image or make me look stupid. Given enough information, you can make anybody look stupid. That's what the presidential race shows, right? (Laughter) Right?

No matter how perfect you are, right? if there's enough scrutiny, you will find cause, you know, to have a negative view, and one of the perplexing things in politics is when nobody knows you, your negatives are zero, and the more you get known the more your negatives go up. And in a world where we have infinite telemetry on

everybody and we can know that much, we can definitely wreck peoples' lives.

And the question is: who should we be afraid of? Should we be afraid of, you know, our ex-girlfriend, our ex-boyfriend? Or should I be afraid of my teacher or my student? Should I be afraid of someone -- a citizen in society? Should I be afraid of a software company, like Facebook or Google? Should I be afraid of the government? Should I be afraid of the local police force?

Well, the truth of the matter is, you know, if I want to abuse my privilege, I'm a policeman -- there are a thousand ways to abuse a police badge. If you heard a knock on the door at 10 o'clock in the morning -- "knock, knock." "Who's there?" "Police, open up, I have a search warrant." Would you open up? I mean, I wouldn't. Right? I mean, would you tell your daughter to open up the door because someone knocked on it and said they were policemen? What if they were wearing a uniform? What if they have a badge? I can fake all that. What if I'm a policeman and I just want to screw around in the women's dorm, right? I could fake that. I mean, the point is we live in a very unsecure world today. I can flash a Secret Service badge, a police badge, a DoD badge. I can flash a doctor's badge. There's no way to track it. There's no way to ensure I didn't abuse my privilege. And, in fact, people do abuse their privileges.

In my book, I have an anecdote. I talk about -- it's from the economists. They filled up a truck with Guinness beer and they drove it around Cameroon for three days. They got stopped by the police 37 times on trumped-up charges -- it's legal to drive a car through Cameroon with beer in it -- stopped 37 times by the police on trumped-up charges, and the police stole one-third of the cargo, okay? (Laughter) And we could say oh, it's not like that in America? Is like that in America, right? I mean the state of New York, right? Just had a major corruption scandal in the office that was actually investing all of the New York public trust money, right? You know, the mayor of

Chicago has gone to jail how many times -- and governors and all that? The point is all throughout the world, whenever people use official credential to do anything, there is corruption.

When we switched mobile identity, the difference is everything gets dragged in the light of day. The negative is, you know, the government could subpoena your whereabouts. The positive is nobody can hide, right? So, if you're afraid of the political system, I suppose then the biggest enemy is government. And I would say at the end of the day I'd be most afraid of the government, right? Because the government is in a position to violate your civil liberties more than anybody, and so we do need a body of law that protects people from that.

It's not different, by the way, than if we started talking on the phone, right? -- The government can listen to your phone calls, right? We have wiretap laws. Do we really want the government to listen to everything we say all of our lives? I think we need a body of law that covers that, and a body of custom. But I also think that we need a law that protects you from fellow citizens and from corporations.

But at the end of the day my key point would be I trust Google and Facebook a lot more than I trust any government on earth, right? Because they're economic entities. If it comes out that -- if it came out that the CEO of Google was snooping on you, that would cost Google $50 billion. And it would cost him his job, right? If it comes out that a government is snooping on you, there are no consequences to anybody. And, in fact, it may very well be legal, and if it was illegal, I mean, show me someone that went to jail for abusing their power in government in this country or another country, right?

And so I don't really -- there's a tendency to be afraid of the Googles and the Facebooks of the world, the technology, but at the end of the day those are run by

citizens who are subject to the law. And there's really a good amount of fear that if anybody's acting improperly there will be massive political, legal, or economic consequences.

I think that it's different with governments, and so I do think we need to be concerned. But regardless of all that, at the end of the day -- you know, antibiotics were a lot more for the good than they were for the bad, right? I mean, a billion people died of tuberculosis, and then penicillin came along and stamped it out.

The average life expectancy in the United States went from 50 to 70 over the course of about 60 years at the beginning of this last century. And a (inaudible 1:13:13) through the conquest of infectious disease. And so you can say medicine -- what about the, you know, dangers of medicine, the dangers of pharmaceutical, the dangers of this? There always is some misuse of this. But 95 percent of the impact of most of this technology is to stamp out inefficiency. And if we've got 500 billion to a trillion dollars a years of inefficiency in our system, then stamping out that is going to have so much more profoundly good consequences that the negative consequences, even if they do take place, will be a footnote compared to the positive.

MR. WEST: Right there is a question.

MR. ALTMAN: Fred Altman. And I question your faith in the integrity of industry. There has been probably a lot more corruption in industry than there has been at least in the U.S. government. And you're constantly talking about the laws, which presumably are government-instituted laws, so I think you need the government to do that. And you have, at least (inaudible 1:14:32) you have a way of changing it, and it seems to be under better control than a private company.

MR. SAYLOR: Yeah, okay, if we get into the issue of how much government -- it's a bit beyond my pay grade. (Laughter) I would -- look, I would say I

can't think of -- the greatest success of the past decade is Apple, Facebook, Google, and

Amazon. Those four companies together have created $1.1 trillion in wealth in 10 years,

okay? So, 1.1 trillion was created, and no one would maintain that they were government

entities or there was any government official involved. So, I'm unaware of any innocent

human being that was killed by any of those four companies, right? I mean, they don't

murder people, they don't start wars, they don't throw anybody in jail. All they do is

create products. And if someone's life was undermined by the product, it would have to

be a very, very complicated tangential process by which some factory in China got

mismanaged and someone got stressed out.

On the other hand, governments put people in jail, sometimes wrongfully.

Governments start wars. Sometimes we disagree with the wars. They start --

governments drop bombs in order to kill bad guys and they kill their families, sisters,

brothers, and wives at the same time. So, I'm -- in the world of ethics, I'm hard pressed

to see a guy that runs a company that creates millions of middle-class jobs as an evil

figure or a dangerous one. I'm much more on the side of free market, and I think some

people don't believe in free markets. There are Communists, there's socialism, there's

capitalism. I like to think that America is based on freedom and liberty of the individual,

and if you don't have freedom and liberty to create things, then I don't how we'd be here.

I'm quite sure that in a controlled market, we wouldn't have Apple, Google, Facebook,

right? Apple was founded by a high school dropout -- college dropout. He wouldn't get

funding, you know? And Facebook was founded by a college dropout. He wouldn't get

funding. And Jeff Bezos and the guys at Google are kind of just very, very avant-garde

and they wouldn't be funded in any kind of centralized economy.

So, I'm a big fan of freedom and liberty and the free market in America. I

grant you there's a place for government. I'm all in favor of government. I think we need

traffic laws. If we don't have traffic laws, people would drive on the left side of the street and smash into each other at intersections. So, I'm not naïve as to the role of government to create security and safety and order in the eco system. But at the end of the day I don't think we have that much to fear from businesses creating software technologies. I think we have a lot more to gain from them. And to the extent that there is growth in the economy today, the growth is being driven by American software companies that are creating goods and services that everybody on earth wants, that are delightful, right? You didn't need to pass a law to force people to buy the iPhone 5, right? People are going to rip it out of your hands, because they want it, and I like the idea of doing things that people want to support me in.

MR. WEST: Okay, we have time for one last question, this woman right next to you. If we can get her a microphone.

SPEAKER: He stood up three times, let him go ahead.

MR. WEST: Okay, this will be the last question. Sir, go ahead.

MR. HURWITZ: Thank you, Mr. Saylor, for an excellent presentation. It is certainly very eye-opening.

I'm Elliot Hurwitz. I'm retired. And I just wanted to ask this question.

On the way here this morning I noticed that many people seemed preoccupied with mobile electronic devices, while others seemed to turn off the media. Where is mobile computing taking society?

MR. WEST: Nothing like giving a guy an easy question.

MR. SAYLOR: You know, it took me an entire book to answer that question. (Laughter)

MR. WEST: Yeah, you should get this book.

MR. HURWITZ: (Inaudible 1:18:42 -- overtalking) to do so.

MR. SAYLOR: My knee jerk reaction is read the book.

A pithy answer is taking society to a better place with some perplexing challenges that need to be resolved by intelligent politicians, philosophers, and lawyers and a thousand opportunities in a thousand different areas of the economy waiting to be exploited by the innovators.

When the dust settles, everybody will have more of what they want at a lower price with greater convenience; and a lot of things that we used to have, things that we became comfortable with -- the morning newspaper, your desk, your wastepaper basket, your yellow stickies, your filing cabinet, your office environment, your clock radio, your video camera, your DVD player -- a lot of things we used to have are just going to eviscerate. They're just going to evaporate. They'll be gone, and a lot of customs -- books will go away, libraries will go away, book signings will go away -- there's nothing to sign, right?

The authors will remain, but, you know, in the world of tomorrow, you know, a six-year-old girl will take a tablet computer and she will be able to access 500,000 books in one second for free, and concepts of place and time and school and education all disappear.

I was 14 years old before I could learn a foreign language, and I was given the choice of Spanish or French. You would have had to pay 15 or $20,000 a year to go to that school. It's a public school, but the point is someone had to pay money, and so I had to wait until I was 14. I could take four semesters. By the time I was given the choice to learn a language, it was too late for me to master the language. It was kind of, at the end of the day, a footnote and a joke. If you don't learn the language before age 10, you won't learn it without an accent. If you want to become a great author or a great communicator in the language, you'd better start learning it around age 3 or 4.

In the future world, a $100, $200 tablet will teach anybody at age 3 anything they want to know for free at their own rate, right? And all of the norms, right? The constraints on the world -- my parents, their views, my economic circumstance, where I was born, the religious opinions of the person that controls my city, you know? The political opinions of the mayor, the school board, or the President of my country -- all of those things will no longer be constraints on my mind or my capability. I'll have the freedom, and I'll be empowered to learn what I want, to trade with who I want, to do business a thousand miles away, to learn what I will at my own rate, and to do it at a variable cost of zero, and I think the result of that will be billions of people being lifted out of poverty into the middle class and billions of sophisticated individuals being educated and millions of new types of professions and jobs being created, which will fan diversity of our intellectual ecosystem that gives us a chance to conquer the future and to continue to drive the civilization forward and to get out of our rut.

And so I think it's a brilliant, wonderful, manifold future that we're looking at that will be fueled by goods and services that, in essence, are delivered to a billion people in a second for a penny. That's the promise of the mobile wave.

MR. WEST: And if you want more details, you can walk across the hallway to the Brookings bookstore and purchase your copy.

Michael, thank you very much.

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