Department of Management public lecture

Seizing the Opportunity of the Cloud: the Next Wave of Business Growth

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Moderator Professor Saul Estrin, Head of the Department of Management, London School of Economics: Hello and welcome everyone. I think it's a tribute to our speaker that so many people have come early in the morning and I believe there's a queue outside. I'm not going to spend a lot of time on introductions; I think we all know why we are here.

Steve Ballmer followed the advice I tend to give a lot of our students, which is to take Maths and Economics, only he was, unfortunately, not here but at Harvard. He, since then, has spent most of his working career at Microsoft, ending actually as the CEO, which is his position now. Some of you will have seen him on YouTube or on other videos. He's a very energetic presenter and I think with no more ado I should welcome him to LSE, announce the title of the lecture, Seizing the Opportunity of the Cloud: the Next Wave of Business Growth, and hand over to him.

Steve Ballmer: Well, thanks. It's fun for me to have a chance to be here. I was actually telling folks on the way here the whole story; when I graduated from college, which is now a long time ago, I came to London on vacation and I wanted to see the London School of Economics and there wasn't one beautiful building like this one at the time and I think I wandered around for the better part of 45 minutes not quite sure which building was which, so to speak. So it was just really fun for me to have a chance to come in and say 'Wow! This looks pretty darn nice. You're living right here in the LSE'. I'm jealous. A girl down here in the front row has a nice LSE T shirt; I am going to see if I can get somebody who works for me to pick one up. I think I'll look better jogging the streets of London in an LSE T shirt than whatever Nike stuff I had on this morning.

I will spend a little bit of time and talk about kind of the big opportunity that I see in the technology industry today. I will talk a little bit about some of the things Microsoft is trying to do to seize on that but in a sense I want to talk to you about the general shift in phenomenon and opportunity that I think that presents. I know we have a little bit of a mix of folks in the audience. By visual description, it looks like we have some students and probably some non-students. By visual description, we may have some engineering students as well as people who are more traditionally management and business students and I want to try and give a sense of where the sweet spot is in our industry.

The first thing I'm going to say is kind of obvious, but bears repeating, because it's really interesting if you think back about the history of what has happened in business quite broadly. Our industry, information technology, really has been switched on since about 1950, the first mainframes. So we are running along at about year 60 of the information technology revolution and yet when we look ahead five, 10, 15, 20 years, there's no end in sight to the incredible things that will be done, the incredible innovations that will come to market. There are very few technology revolutions that you can find in history that have had the pace of development, change and impact that our industry has for the last 60 years, and yet I think we will look back 40 years hence and say 'Wow. It continued.'

So sitting in a room like this as students, trying to decide what I might do with my life, I can't imagine a better industry or better place to be grounded than in the information technology business. Whether you want to be a direct participant in our industry, whether you want to change

the world and make a big impact in the pharmaceutical and health business, the education business, the business of environmental and energy science, information technology will be one of the major propellants of advances in all of these industries – all of them. And so in a sense I think being well-grounded in what is going on in our industry is just simply good business and good practice for all of you because it will be so important as you take steps forward to do whatever it is that you choose to do.

There's an irony to the fact that if you ask most CEOs around the world today what the largest expense item in their budgets, that they don't feel they have a visceral understanding of, it is usually information technology in fact. So I am a bit of a – what shall I say – a proselytizer on this point, but you are at a unique time in your life when you get a chance to think about and have a chance to study more before you have to forward and make commitments.

Our industry is going through quite a wave of invention and it has been powered by, in my opinion, one major phenomenon and that phenomenon sometimes we refer to as the shift to the Cloud. And nobody knows what this is or what it means exactly. I gave a speech to about 100 CEOs at our headquarters in Seattle in May and I thought I'd… Mwah! Huh! I thought I'd nailed it, describing the Cloud and after I was done, it was kind of quiet. We had a couple of journalists who were not there as journalists; they were there as panel moderators. One lady who I actually watch frequently on television, she puts up her hand very politely and she says 'Steve, I really thought that was great, but I still don't know what the Cloud is.'

I am not sure I will do a perfect job today and I am not sure that is the most important thing. The Cloud to me reflects the transformation that's going on in the computing world from things which are islands, from things which are either in a corporate data set or in the Internet to things that are in both; from things that are either in a PC or a phone to things that are in both; from things that may be isolated, like the TV, to things that can span literally your entire digital life. The Cloud is just an industry codeword for talking about using the Internet and smart devices in new and different ways.

And to some degree when people talk about the Cloud they will talk about all the money it could save to enterprise people spending money on IT. When I talk about the Cloud we will talk about that but we will talk about how it changes the way you write every program that gets written; we will talk about the way it changes the way you design and build every computing device on the planet. We will talk about the new kinds of applications that you couldn't have built in a world without the Cloud. We might think we have kind of gone full circle on that; we have only scratched the surface and I will talk a little bit about that.

The two things that are absolutely clear about the Cloud is that the Cloud will open up a whole new range of opportunities to use computing in more valuable ways; a whole new set of opportunities for people to go out and build companies and make money off of the back of their creativity around information technology. The Cloud will certainly do that. The Cloud will certainly also bring with it a new set of responsibilities in terms of security, privacy and data availability, because as soon as you start pooling computing and data in new and interesting ways, really defining and really being careful about weighing up who owns what data and how it is controlled and used is a fundamental responsibility of every participant in that chain. You will see, there will be a lot of discussion just about privacy as one example of that; privacy is a particularly good one but there will be more and more.

We will begin with just one example on opportunities. In the world of science – and you can take almost any part of science that you want to today – one of the great needs is for scientists to be able to share data and results more effectively and for scientists to be able to run more experiments more quickly. The ability to use the Cloud as kind of a virtual computing resource in which scientists can literally share one another's data, share one another's results and have access to the kind of computing resources which no one scientific enterprise would be willing to stand up but in aggregate could come together to allow people to model and conduct many more

experiments in the virtual world than anybody could ever run in the physical world is a real opportunity – is a real opportunity – and one certainly our company, through our highperformance computing work, is pursuing today is. People will tell you that scientists tend to be a little bit more proprietary about their data so I am not going to say it is a linear path, but without the technology to enable it, it is kind of an idle philosophical discussion. Now we reach a point where the technology will really permit what I think is a very, very powerful new opportunity. So I am particularly excited about the kinds of new opportunities presented by the Cloud.

We, certainly, as Microsoft have worked with a lot of customers, not just consumers. Consumers are embracing the Cloud almost implicitly: 'Sure, I'm on social network; yes, I love my new smartphone. Yes, I'm willing to roll my documents or my notes and share them through the Cloud'. It's almost second nature as long as we provide the capabilities to the consumer. But companies are also now increasingly willing to commit themselves and to bet their futures and their use of technology on the Cloud. If you take a look at the total spending on information technology, consumers today buy about – I'm going to use a proxy – they buy about two-thirds of the devices, but they only spend about one-third of the money. And so in a sense it's important to see both the world of the consumer and the world of business embrace this phenomenon.

In our own case we happen to have tools that let enterprises essentially move infrastructure, applications, e-mail, collaboration environments, to the Cloud, our BPOS tools, and we have tools that let people build new applications which are fundamentally more scalable, more reliable, and more available across the world – our Azure platform. This is just a list of some of the companies that we have had the privilege to work with on this move to the Cloud.

So, new opportunities, new responsibilities, but what changes? What changes; and I'm going to give you four things to think about concretely that I think are interesting. No. 1, the kinds of applications that we can write that really allow computing devices to be smarter about you and help you get smarter is very different in the world of the Cloud. In a sense, as long as the software that we and the guys we compete against write is good enough, the whole knowledge of the world and hopefully even the whole knowledge of your own organization, employer or company, the whole knowledge of the world should really be available to you in a way that you can access and take advantage of it. We need to build software that understands you and what you want and software that understands and can categorize, not just all of the documents and websites in the world, but really understands and brings knowledge. It looks inside of what's out there on the Internet and it can impute knowledge about that and try to bring them together.

Saul gave me a book on the way in here written by the president: 'Who is to blame for the financial crisis?' The truth of the matter is I have no clue, but I will do my homework and read the book. But about two years ago I was sitting in my office around Christmas time and saying 'Oh my gosh. I wonder what is going to happen here? I mean, how bad is this thing? What are we going to do, you know, with the cost base at Microsoft?' I said to myself, I am no expert in economics; yes, it was part of my degree, but I am not an expert in economics. But I kind of had this visceral sense that part of the problem is there is just too much darn debt in the world. And I wanted to do a little chart, by year, by country, for several countries: 'show me private debt as a percentage of GDP'. I could tell you that that quickly. Why couldn't I just say that to my computer and have it go get the information, bring it back and put it in a spreadsheet for me? That's just a software problem.

But in this world of the Cloud we will build the software that understands both me and the world well enough to allow those things to happen. The Cloud's actually an amazing thing because it gets smarter every day. It gets smarter, people write new documents and put them up on the Web every day. It turns out that all of us, walking around with our smartphones – if we want to, we can make the Internet and Cloud a smarter place. Because all of the – somebody who watched Smartphone GPS activation patterns yesterday; I bet they looked really weird and wondered – with the Tube strike – there was a lot of really interesting things to do with that data do get smarter, as long as your privacy is wellrespected through the process, which I think is very

important. But I think the kinds of applications that we can write as we learn more about the world, and the knowledge about the world and more and more about individuals will really be amazing.

The Cloud will also be a place where we can continue to think about enhancing social and professional interaction. Five years ago I could give a speech like this and there would be one video camera and not four and I was always sure that nobody would ever watch the video; 100%. I used to kind of tease the cameraman 'Sorry dude, you are here again making a video – nobody's going to watch it'. The Internet kind of spiked that a little bit. Nowadays occasionally somebody will watch one of these things, but it is still not what it could be in terms of transforming the way in which people interact. It wouldn't be the same if I was not here. It should be; technology should be good enough that if I wasn't here it would be as valuable to you and to me as if I were here. It is not good enough today. If you want to quickly pop up a place and a way to collaborate – let us say a landlord, a potential tenant, some bankers and a lawyer, and you want to have secure, private communication? Hard to do. If you want to know who's a fan of Britney Spears? Really easy to do. If you want to know who's an expert in certain geography, in lung cancer? Much harder to get to know.

So the ability to let people interact professionally and socially around topics: we are in the early part of the game, so to speak, as an industry. And the technologies to facilitate that, the underpinnings and what you do with them will continue to change our applications, I think, in really remarkable ways. People are kind of all excited now about Foursquare in places and – if you think about it is a relatively small kind of innovation. And yet even a small kind of innovation can have a big kind of an impact if we think about the world quite differently.

From a technology perspective all of us who have been in the business are going to have to not only re-think what we use technology to do but also how we build the programs that power the solution. When I arrived at Microsoft the world was about mainframes. It started being about mini computers. Then it turned and was about client-server computing. In almost all those generations if you went to the computer room, the computer room had a heavy air conditioner, with these fancy floors and big, racked, hardware and you wrote a program; you would say 'yes, that is my machine'. It was either 'my virtual machine on the mainframe' or 'that is my server; don't touch it; it's for my application'. There was a certain mentality. And it turns out that the way we built physically the data centers; the way we built the servers, the way we build the applications were all designed around a hub; that is not the way things work in the Cloud. A data center literally should be kind of like a shipping container that you can put underneath, maybe a roof to cover it from water, throw in a little electrical, throw it a slab of concrete – that is all it should need for building – plug in a little garden hose to cool them off – yes, just a little garden hose, environmentally sound – plug in, insert the electricity and an Internet connection. Think of all the cost, time, complexity and environmental waste that takes out of the system.

When you build the application you have to build it so that nobody needs to be around to manage it. In our Bing search servers we have hundreds of thousands of servers. If we had built that service the way applications have traditionally been built for data centers we could never possibly be upgrading it, changing it, deploying it across the globe at the speed with which we do. A whole new way of writing applications, which means people have to learn those ways and there'll be a new competition among companies like ours and others to provide the core technology to get us there.

The Cloud wants smarter devices. This is – it was semi-controversial; I think it is now 100% obvious. When we first started talking about the Cloud there was a view that said 'yes, OK the devices that we use will all get dumb and all of the intelligence will move back out into the Cloud'. And what we have found is quite the contrary. People want smarter devices but smarter devices that can connect with the Cloud in intelligent ways. We just launched a new version of Internet Explorer 9 that really integrates with Windows. Why is it important? Because it's about both supporting Cloud standards, HTML5 etc, but by doing a better job against those, by taking advantage of the hardware and hardware acceleration capabilities that are built into the PC.

As we buy smartphones people are writing little front-end applications that can talk intelligently to Cloud services. We are on the verge of launching a new such phone. But perhaps the device that I'm most keen on that will launch this Christmas season, which shows a different kind of relationship between the device and the Internet, is the next generation of our Xbox product, which allows you, with your body and your voice, to control everything that is going on on your TV screen. We say you are your control. And yet all of the important content, and information and interaction with friends is all happening out through the Cloud. So you want a smart device processing 'me', talking to a smart Cloud on the back end.

I think we have a little video that maybe I will just show you so you get a sense of how some of this stuff might work. Hit play.

[Kinect video plays]

You will again see more when we actually ship next month, but it gives you a sense of why the Cloud might want smarter devices. You want the ability to do things locally; you want the ability to use natural user interface and process language and voice and action locally. And yet you do want to be able to participate in games and track meets and dance competitions with friends, potentially, around the globe. So we need to think about using the intelligent TV, the intelligent PC and the intelligent phone to participate in this new kind of application that people are really going to want to write.

I'm going to spend all day today in the U.K. I don't get to spend all day with student audience; this for me is a lot of fun, but I want to make the key point which I think folks here probably understand. The U.K. is very much an innovation leader on a global scale and to a disproportionate degree of population. The U.K. and the U.S. in terms of not only of what gets designed in the countries but what gets adopted and consumed, set trends that wind up shaping what goes on, really, around the world. When we launch our new Windows phone, which we'll launch later this month, our launch country will be here in the U.K. and we know that this is a place where if we got the product right we are really going to get a good early reception, because it's a country in which the early adoption of technology really happens.

Microsoft has a base of around 30,000 business partners, systems integrators, product developers – a broad community of partners that we work with in the information technology field in the U.K. and we certainly look forward – whether you choose to be in our business, a user of information technology in somebody else's business or just a consumer of information technology products for yourself, we look forward to working with you more, getting to know you better and continuing to build the relationship. I think we have some time for Q&A, which I'll be excited about. If we don't get to what is on your mind, my email address is steveb@microsoft.com; please feel free to ping me afterwards, but we're looking forward to your questions, your thoughts and your dialogue. Thanks very much.

Moderator: Well, Steve said previously he was going to try and nail the Cloud. I think he's nailed it for us this time at least without any doubt. He's willing to take questions. I think I'll take a few questions at a time; there's a big audience here. So if you put up your hands; there's going to be roving microphones. We'll take a few questions and then Steve will answer. OK. Let's start over there. There are two over there so pass one to the other.

Georgina Prodhan, Reuters: Good morning. It is Georgina Prodhan from Reuters. I wanted to ask you: could you explain what makes Microsoft's Cloud computing offering distinctive. I think a player with the size and resources of Microsoft, we may have expected to have a bigger position by now. Thanks.

Ian Grant, Computer Weekly: Ian Grant, Computing – Oh, Computer Weekly, I beg your pardon.

[Laughter]

Steve Ballmer: They both work for me! They are both OK with me!

Ian Grant: Steve, I was at an event where you were once introduced as Bill Gates, so…

Steve Ballmer: We look alike!

Ian Grant: Indeed. Anyway, Stuxnet seems to herald a completely different way of – a different threat to the world, especially the joinedup world of the Internet. I was wondering what Microsoft's view on it was and what we're going to have to do to combat that sort of threat in future.

Moderator: Do you want to take those two?

Steve Ballmer: Sure. Let me kind of take them in the order there because I think that makes sense. I love where we are in the Cloud. On the business side, I feel like we are way ahead of whoever the closest second competitor is. On the business productivity side, whether it's capability, reference, customers, production seats, there's really no comparison, I think, where we are versus the other competitors. On the platform side – which in our case would be our Windows Azure and SQL Azure business – we've got competitors who want to do the Cloud, but actually aren't trying to do new platforms, like Amazon; and then we have competitors who aren't serious about the public Cloud, only doing things privately kind of like Oracle and VMWare. The fact that we've got a strategy for public and private Cloud, that we're in production with the public Cloud, that we have already private Cloud infrastructure in market, I really like where we are on the enterprise side of the Cloud quite a bit.

On the consumer side of the Cloud, I think we have some strengths and we definitely have some opportunities to improve our market share. Certainly with Windows, with IE, with Hotmail and Messenger, we have some strong positions. And I'll say on the phone and all of the cloud infrastructure that backs it up, I'll be pleased to announce our next generation of phone here in another week or two. And obviously the Kinect stuff. I'd say the whole sort of Cloud TVconnectivity thing is really early. But if you take a look at what you can do with an Xbox this holiday, I think it's quite a bit ahead of anything that at least our traditional competitors have.

On Stuxnet – the degree to which, inevitably, society goes ahead and makes a commitment of the way it works onto the backend Cloud infrastructure is a big deal. And we can all do a great job respecting one another's privacy, etc. And nonetheless there will be – there will be – not 'there can be' – there will be bad guys in the world. And we need to design infrastructures, we need legal approaches, we need prosecution, we need education that make sure that we can get the same kind of protection, whether it's of personal assets or corporate assets or national assets, that people expect, if you will, in the prior world. That isn't going to be an easy challenge. No question about it. And certainly we're hard at work at it, as are nation states around the world. I mean, government in most parts of the world really gets this. The degree to which government can harmonise what it believes would help speed the pace of development – but I'm not sure we ought to expect government harmonization any time soon. It sure would be nice if Europe was harmonized; it sure would be nice if the U.S. could harmonise itself, relative to its state governments. Because if we could get some unification in Europe, the U.S., China, I think then you start to at least get a framework that allows innovation to proceed, and understand what needs to happen from – let's call it – a protection of asset perspective.

LSE Student: My question is: What is your favourite game on Xbox, and why?

Steve Ballmer: Beach volleyball, baby!

[Applause]

My kids will tell you that I think that's a lot of air under my feet, but it's still my favorite.

[Laughter]

That would be a new Kinect game, coming soon to an Xbox near you.

[Laughter]

Chris Dock, LSE Student: I think you're going to be a really great volleyball player. My name's Chris Dock. I'm a student at the Management Department. My question is: you are presenting the Cloud as the new innovation that's going to change the world. But my question is: don't you think that the Cloud is also going to widen the gap between the 2 billion people that are living at the bottom of the economic pyramid, as it is called, who do not have the resources and the access to the information technology that we have in the socalled first world? And do you think the Cloud will be able to change the way that we address problems like poverty and climate change in the future, also for these people? Thanks.

Steve Ballmer: The truth of the matter is: any advance has the possibility of being helpful, relative to floating all boats or not. In this particular case, this is a technology that will drive productivity, will drive innovation and will drive advance. It is clear that the size of the world's pie, if you will, will be expanded by the technology that's coming. Whether the distribution of the pie maps to what you or me or somebody else should think, it's a little trickier. But most of what I talked about does have the prospect both of helping people work on problems that are more unique to the bottom of the economic pyramid, which is good; and has the potential for making technology more affordable not less affordable because people can share infrastructures in the Cloud as opposed to having to build their own proprietary infrastructure for each purpose. So I think we should be optimistic, both in terms of overall impact and potentially specific impact on the bottom of the economic pyramid.

Moderator: Do you want to go to the front there?

Steve Ballmer: Shall we do all three?

Moderator: Yes, can we take all three and then…? OK.

Kelly Fiveash, The Register: Hi Steve. Kelly Fiveash from The Register. Does this mean the operating system is dead? I asked that question from the point of view that the R&D spend that is going into Cloud computing now of Microsoft is obviously where you guys are at. Goldman Sachs yesterday also downgraded the company to neutral, so I'd like some comment on that please. What does it mean for the development of Windows 8? And also, can you kind of perhaps just give us your views on Chrome OS, which is also coming out shortly?

Steve Ballmer: I'm sorry, my view on what?

Kelly Fiveash: Chrome OS, Google's operating system.

Steve Ballmer: One more time.

[Laughter]

No, no, I can't… The acoustics are designed to go this way, not this way. So one more time please.

Kelly Fiveash: So Google's Chrome OS.

Steve Ballmer: No, that was funny! I didn't even intend it!

[Laughter]

Charles Arthur, The Guardian: Charles Arthur from The Guardian. You've talked a lot about Cloud computing, but Microsoft has lost a pile of money in the past few years on the Cloud. The online services business is losing money more than any other division. How do you actually propose to make money out of Cloud services? And can it replace the amount that you might lose in any migration away from the desktop?

Carson Sorensen, London School of Economics: It's Carson Sorensen from the LSE. Related question actually. So the mainframe created the IT function. The PC changed it quite dramatically. So how will the Cloud computing change the IT function or the IT profession? Because Nicholas Carr has argued that they will all work in electricity factories, whereas you are arguing that they will all be the forefront of innovation. So obviously both must be the answer somehow and I'll be interested to hear your opinion on how.

Steve Ballmer: Let me try… I don't know quite how to weave a thread exactly through all those, but I think the first two were sort of 'How are you guys doing as a company?' and the second was kind of 'What's going to happen to your IT and technical customer base?' How are we doing? Pretty darn good. Could be better. Always could be better. But, you know, we're a company that, I don't know, will make about US$26 billion of profit pretax. I think there's one company in the world that makes more than that, so I'm not going to be apologetic about our financial results nor our investment. I think we've done a pretty good job. We're making money on what we do in the Cloud, with the exception of our search service where we've made a very deliberate decision to invest. I would actually advise all young students entering business to understand that sometimes you actually have to invest for the long run; you can't be short term and kind of fast in your approach. Sometimes you have to stay with what you believe, even if it turns out to be publicly unpopular, if you believe that it's the right thing to do.

We had a round in the early 2000s where people were telling us we were wrong to do Xbox. I don't feel wrong to be doing Xbox with the kind of profit that it's making and the innovation that we've got. I don't feel wrong about it at all. Does that mean that there aren't things that I wish we'd done differently along the road and we'd be even more successful and even more profitable? Of course I do. That would be the case almost no matter what. Will we have more competition? Of course. If you're in a business where you make a lot of money and where a lot of cool, interesting things are happening, it's crazy to think you're not going to have competition. We're going to have competition, Oracle's going to have competition, Apple's going to have competition, Google's going to have competition. We'll all compete with one another and all of you will get better kind of – you'll get better solutions at better prices consequently. So I think that's kind of the way it is.

In terms of what will happen to the makeup of the information technology business, by our account – which could be wrong – there's probably between 20 and 25 million people around the planet who work directly somehow in the information technology business. They work at a vendor, they work in the IT department of a company, etc. There is a chunk of that – a chunk that's probably more like 1015 percent as opposed to a much bigger chunk – whose jobs will be automated in new ways as a consequence of the move to the Cloud. On the other hand, most IT shops, most companies, have a backlog of things that they would like to build that is super, super long. And while there might be a bit of a painful transition in the process, I think what you can kind of do mentally is: you decrease the percentage of IT spend across the world that's spent on maintenance, and you'll be increasing the percentage of IT investment that's spent on new development. That doesn't mean it'll happen kind of instantly, regularly, every day for every human, but I think that'll be the course of the next several years.

[Inaudible], London School of Economics: [Inaudible] from the LSE. What's your take on the future of our tablet computing in relation to the Cloud? And how do you think, say, the growth of

Google's Android operating system and Apple iOS devices is hindering the growth of Windows in this region, in this area?

Andrew, London School of Economics: Hi. I'm Andrew from LSE. You pointed out, Mr Ballmer, some interesting perspectives on consumers and business in terms of expenditure and actually preferences. I was actually willing to ask you: what are your thinkings on egovernment improvements due to the Cloud possibility? And since we have been watching a couple of countries, including the UK, cut expenditure on IT services and so on, how can Microsoft improve it, giving best value for money on this new kind of strategy?

Robin Jacob, London School of Economics: Thank you. Robin Jacob. LSE Alumnus Governor, Patent Lawyer and Judge.

Does the patent system assist you or is it in the way? And in particular, in the future developments of the Cloud, which are going to be interactive with all sorts of different companies, having different bits of proprietary rights, is it in fact going to get in the way?

Steve Ballmer: I'll kind of start at the end and then work backwards. I think it's a real good question. Is the patent system perfect for the world in which we live? The answer is, of course, not. The patent law, by and large, was crafted in a day and age that preceded modern information technology. There are differences in the way we think about invention and innovation. On the other hand, with that said – and we think patent law ought to be reformed to reflect kind of modern times – if you ask me, in general, are we better off with today's patent system or no patent system? The answer is: we are better off with today's patent system. And I do think thoughtfully and hopefully in a way that actually concludes: patent reform needs to be taken up on this side and on the US side of the Atlantic. And we've certainly been involved in that debate.

But getting rid of the patent system in some way would not impede technological progress. There really is a set of reasons why you want to protect invented innovations. There is a way in the system to try to, you know, sort of weed out frivolous innovation, to qualify the things that are really important. There is a set of things, negotiations that happen, at least between substantial companies that kind of work this through – it's a way to deal with the fact that the system is imprecise. Companies try to avoid those issues by working things through privately, which I think is also a valuable help. I do believe that the small inventor ought to have a seat at the table. Yes, sometimes big companies can feel 'under the gun' about that. But I do think there's an important role for the small inventor.

So, on balance, I think the patent system today helps, and yet I think the patent reform should be taken up because both – let me say, at least two of the biggest generators of patents are the pharmaceutical business and the IT business, the software business, and neither industry existed when most of modern patent law was written. And I think there is proper reform that can help all parties and have the patent system do more of what it is intended to do. And this comes from a company that has paid more out than we've taken in licensing patents, and yet I still tell you I think the system is helpful and important and constructive. Just so I wear my experience on my sleeve.

In terms of egovernment – I think it was the gentleman over here – and cloud and spend and the like, if you take a look at most IT budgets, probably 70 percent, close to it anyway, gets spent on labour. So if you really want to help anybody save money on IT, you have to say 'how do I help people save money on labour?' If you take a look at one of these modern data centres I described, they have a lot fewer people in them than today's data centres do. So I think the fundamental advance that will help – whether it's the UK government or other institutions – save money is the automation of tasks today that require a lot of labour. Sure, we always have a chance to cut our price. We tend to be the lower cost participant on most bids; we are not the most expensive guy. So we have been a force for price reduction. But that sort of misses the big picture. The big picture is: software helps automate things that people do and software helps

reduce the amount of hardware it requires, because both of those things are bigger in the food chain of cost. And moving to cloud service is a way to kind of bundle a couple of those themes up.

Gentleman over here asked about phones and tablets and the like. I think the thing for at least most of us in the developed world is: we are going to want to have and be able to afford to have technology in our pocket, on our big screen, and our mediumsize screen. Big screens are great for social activities with multiple people. You saw that a little bit in the Kinect demo. There's nothing quite like having a bit of intelligence in your pocket. And, you know, on the pocket side, we got out to kind of an early jump. We've had competition come back in ways I'm not excited about. Now we've got to come back against competition. And I think, with our new Windows phones, we really have a beautiful product. I mean, people have to take a look at it and decide, but it is my belief that when we launch those products in a couple of weeks, people will look at them and say, 'Wow.' I think people are still going to look at at least one or two of our competitors' products and say 'wow,' but yesterday I had a kid come up to me after a speech like this in Stockholm, and wanted to take my picture with one of our competitor's phones – to be nameless – and then he asked me for a free Xbox. I told him I'd give him the Xbox if he got himself a pretty Windows phone and got rid of that ugly competitor phone. So people will have to make their own assessments on that.

The bigger screen form factor slate/tablet, very different discussion. We, as a company, will need to cover all form factors, and certainly we have done work around the tablet as both a productivity device and a consumption device. You know, I've been looking around the world today, and frankly, the people who are typing with a keyboard look more comfortable physically than the people I've seen typing without. And yes, I can tell you how much of what is in the audience. I can tell you how many Macs; I can tell you how many Windows machines; I can tell you how many phones people use; and I'll tell you how many iPads are in the room. I won't do that right now, but I could. That's kind of my job. I get paid to count that.

[Laughter]

And so exactly where the form factors are and how they evolve – and you'll see, you know, slates with Windows on them. You'll see them this Christmas. You'll see them continue to change and evolve. But if you really want most of the benefits of what a PC has to offer – the ability to create and consume, take documents of all types – a form factor that actually has been tuned for a lot of things over a number of years, we certainly have a superior device, and you'll see us continue to expand the footprint that Windows does a good job of targeting over time.

But the job one thing, right now, is: we've got to get back seriously into the game of phones. And I'll probably leave it because it's down here with my microphone in my pocket, but I love my Windows Phone 7.

[Laughter]

Moderator: OK. I'll take a question. Two from up there.

Student, London School of Economics: I'm an LSE student from China. You said earlier this year that piracy in China is a huge problem. But some Chinese people accuse that Microsoft has deliberately ignored the cause of this problem in the past two decades. So in your opinion, why has this problem become so serious in countries like China but not in India? And who should be blamed? And in the coming year of cloud computing, which is more harmful to Microsoft and to the whole industry? Piracy or restrictions on freedom or blocking results without legal authority or public explanations? Thank you.

Student, London School of Economics: I'm a student here. I wanted to know: what's your take on privacy issues in terms of corporate and personal privacy that go along with cloud computing.

Moderator: One more and that's all. That one there. Yes.

Chris McMillan: Hi Steve. Chris McMillan. You talked a lot about competition recently. And obviously Microsoft's been one of the most successful companies in the world and continues to be so today. My question is: what do you think it would take to bring about the demise of Microsoft?

[Laughter]

I'm thinking here in terms of competitors and emerging technologies.

Steve Ballmer: Let me start with the third question! Why not? It's a little bit like asking – I don't know whoever the guy was who invented CocaCola – to give him the secret sauce. I mean, would you really ever do that?

[Laughter]

The demise of Microsoft should be a very difficult thing to have happen. And in some senses, the demise of Microsoft will require our complicit behavior because we're not getting our job done. I view it like this … that our future is in our hands. And I think all of the evidence in our industry is that companies' futures are very much in their hands, but they are not assured. We're not an industry where if you build kind of a factory or some kind of capital plant, you're guaranteed to be in business for 30 years. We've got to create, we've got to create, we've got to do new things. We've got to, you know, sometimes look to the future and try to ignore our past because our past can be a help but it can be a hindrance. And we've seen companies in the technology industry fold. We've seen technology companies come from nothing to something overnight. We've seen very few companies stay at a high level for a long time. I'd put Microsoft, I'd put IBM on the list. We've seen companies burst out, fall apart, and then start reemerging. I'd put Apple in that category because they almost disappeared. So the truth of the matter is: our future is up to our good work. It's not really up to what anybody else will do; it's up to what we do. We've got all the advantages to work with, but if we don't work with them we won't realise those. And I kind of like what we're doing right now. I think that was about as good a job I'll do of not answering your question for now.

[Laughter]

In terms of privacy, it's a big issue. The only thing I think I can add – and we take it seriously. We built a feature into Internet Explorer last year that we call "InPrivate Browsing." So literally you really can shut off the world of cookies and advertisers and tracking if you want to do something privately on the Internet. It was a little controversial inside Microsoft at the time, but it's "user in control," but there's a whole ecosystem of the Internet that wasn't really very happy with the decision. But at the end of the day, I do think privacy has to be a decision that users – corporate users sometimes but certainly individual users – get to make on their own behalf. And not everybody feels the same way about privacy.

My privacy I care a lot about. I gave you my email address, but I'm not going to necessarily let you be my friend on Facebook. And if I do, I'm not necessarily going to let you see very much about me. And, by the way, if I don't like what you send me in email you'll be in 'Blocked Senders' the next time you turn it round and send something. So I value my privacy.

My son, aged 15, he doesn't value his privacy all that very much. There's a couple of things he wants private, but mostly, if people want to collect data about him, he wants to get something for it. He wants to get a better service; he wants to get some money. He's always looking for ways to make money. He says, "Dad, why they don't just pay me 25 bucks a year. They can track the heck out of me. I don't care." But he's got a different set of privacy requirements.

One of the journalists in the US wrote an article that said, 'I don't know whether to be upset about what's going on from privacy on the internet and I won't until people actually start using my private information to either help me or hurt me.' Because today, frankly, there's a whole lot more collected than there is private information that gets used. So, to me, the most important thing is: the user's got to be in control and it's got to be a fair and open dialogue with the user: "Here's what I'm going to collect; here's what I would use it for. Do you agree or not?" And you let the user kind of govern where that goes.

On piracy in China, piracy in China is eight times worse than piracy in India. Piracy in China is 20 times worse than piracy in the UK. I don't know who's to blame, but I don't think anybody … I think it's the enforcement of the law in China needs to be stepped up. It's one thing to say, OK, China versus the US, UK, people sort of understand that. But if you look at the environment today, there's a lot more piracy in China than there would be in India, than there would be in Russia, and I think the Chinese government hears the message, because it's ultimately a problem for Chinese companies more than it is for nonChinese companies. If Chinese companies are going to become innovative companies, they're going to need to have IP (Intellectual Property), whether it's copyrighted IP or patented IP. That becomes important in China. And it's to the disadvantage, even more, of the Chinese companies. So, you know, we certainly encourage … it would be worth a lot to us. It's important to us. China is now the No. 2 market in the world, and will be the No. 1 market within the next year or two, for smartphones, PCs, etc. And I think it's really important.

I don't take responsibility for it because I don't know how I could have controlled it. Frankly, we did the same things in China that we were involved with in every other country. The truth is, as we all move to the Cloud, there will be a set of regulatory restrictions that come from government, not just in China but throughout the world. And there is some risk – somebody brought it up earlier – there is some risk that that could be a problem, and, you know, I'm a little nervous about that, particularly in the Chinese case, that that could slow market development inside China. But we'll have to wait and see.

Moderator: Well, I for one could stay here all morning listening, but I think we're not able to. I think one thing that's come out of this very clearly to me, which is that there's very little chance of a demise of Microsoft while Steve's running it.

[Laughter]

We have a tradition here at the school. It doesn't relate, I'm afraid, to "T shirts for jogging." But since Nelson Mandela came and spoke, we gave him, at that point, an LSE baseball cap. And since then, prime ministers, presidents, CEOs, they all get one. And this is yours. Thank you very much indeed from all of us.

[Applause]

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