

ST. PETERSBURG INTERNATIONAL ECONOMIC FORUM

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HOW CLOUD COMPUTING WILL RESHAPE THE DIGITAL AGE

Expanding Technology Horizons

**JUNE 17, 2011 — 14:00–15:15, Pavilion 8, Conference Hall 8.2, Innovation
Hall**

St. Petersburg, Russia

2011

Within ten years one-third of all data is expected to pass through cloud computing networks. No longer simply a concern of technologists, business and government leaders are now investigating if and how to adjust their IT environments for the coming revolution in computing.

Moderator:

Julia Angwin, Senior Technology Editor, The Wall Street Journal

Panelists:

Serguei Belousov, Executive Chairman of the Board and Chief Architect,
Parallels

Brian Bershad, Professor, Head of Engineering Centre, Google Seattle

Philippe Camus, Chairman of the Board of Directors, Alcatel-Lucent

Jean-Philippe Courtois, President, Microsoft International

Anatoly Karachinsky, President, IBS Group Holding

Tomas Kilroy, Senior Vice-President and General Manager, Sales & Marketing
Group, Intel Corp.

Front row participants:

Sergey Andreev, General Director and President, ABBYY Group of Companies

Viktor Orlovsky, Senior Vice-President, Sberbank

J. Angwin:

Welcome to the cloud computing panel. We are going to start off, while people are settling in with the video about cloud computing.

Video:

To meet ever-changing business needs, organizations need to invest time and budget to scale up their IT infrastructure, such as hardware, software and services. However, with on-premises IT infrastructure, the scaling process can be slow, and organizations are frequently unable to achieve optimal utilization of the IT infrastructure.

Cloud computing is a paradigm shift that provides computing over the Internet. A cloud computing service consists of highly optimized virtual data centres that provide various software, hardware and information resources for use when needed.

Organizations can simply connect to the cloud, and use the available resources on a pay-per-use basis. This helps companies avoid capital expenditure on additional on-premises infrastructure resources, and instantly scale up or scale down according to business requirements.

You can deploy a cloud computing service by using three different models: a private cloud, a public cloud or a hybrid cloud. A private cloud functions solely for one organization on a private network and is highly secure. A public cloud is owned by the cloud service-provider and offers the highest level of efficiency in shared resources.

A hybrid cloud is a combination of private and public deployment models. In a hybrid cloud, specific resources are run or used in a public cloud, and others are run or used on premises in a private cloud. This provides increased efficiency.

Oil, travel: volatile industries facing global challenges.

"The whole thing is extraordinarily high stakes."

"Our differentiators are the technology."

"We need a way to go ahead and deploy it very fast."

This story follows two companies that found new ways to gain a competitive edge through I.T. In each case, cloud computing was the key, in particular, public cloud technology, a new paradigm for building applications and processing huge volumes of data.

Baker Hughes is a Houston-based oil field services company on the front line of exploration. Their job is to help oil companies make the most of their reservoirs. Baker Hughes builds specialized instruments that follow the drill bit to measure everything from magnetic resonance to radiation levels.

"If they are drilling a well, and they want to know what to do next, what to look at next..."

To meet ever-changing business needs...

J. Angwin:

Did we lose the audio? Okay, thank you, it is done. So, welcome to cloud computing. We have an incredible panel here, and since I want to make sure everyone has time to speak, I am going to just dive right in with questions for each of our panellists and then open it up to the audience.

So I am going on start on my left here with Jean-Philippe Courtois. You know, cloud computing is in some ways back to the future. I remember when I was growing up, and there were dumb terminals we used to connect to mainframes, and all the processing power was central.

The PC revolution really was empowering. I got to have my own processing power, my own storage. I feel like now, we are in this new hybrid era, where we are going back to being centralized a little bit, and I wondered: how is today different? I know you have spoken about how cloud computing improves on the old model.

J.-P. Courtois:

Well, I think there is a fundamental difference. I mean, in the first one, yes, there is some kind of central computing power, massive computing power. But contrary to the mainframe world, it is actually distributing computing now. It is not just one location, one huge mainframe. You have got some huge capacity being built in connective data centres around the world.

Number two, they do not exist anymore, but I used dumb terminals many years ago myself, where you had this green and black screen. You have actually got some very rich and small devices: smartphones, PCs, tablets, browsers.

And number three, that complementarity of the back end and the proliferation of smart devices enables anyone, any business, to have access to application services anytime, anywhere, and I would say on almost any device. So that is a huge difference, and fundamentally, there are obviously a few big reasons why a company's businesses move through the cloud.

One, it is about scale. You can scale the world truly. Number two, it is elasticity. You can actually use an incredible set of resources to process data analysis, graphics, video streaming, whatever you want. And three, it is real-time access. You have that real time on your device to make a decision.

The last point is a big one. For many years CFOs, CEOs, and even CIOs in companies, I know they love this: It is about moving from IT project equipment that you are buying, purchasing, on a premise, to a model where fundamentally you buy the service as you use it. The user has on-demand access, and that gives a lot of flexibility in terms of the P&Ls, the operational models of many enterprises in the world.

J. Angwin:

Okay, so, Serguei Belousov, earlier this year you said that the top three giants of cloud computing would be Amazon, Salesforce, and Microsoft. Can you talk about why you picked those three and how you see the market evolving?

S. Belousov:

Well, I did not exactly say that – I was giving those companies as examples of companies that have good progress. In fact, the first two companies are the two companies who are making the most traction. You know, cloud is a very difficult term to describe. Everything that is very large is very difficult to describe.

There is a proverb about these three blind people trying to describe an elephant. One of them is touching the tail; one of them is touching the nose; and one of them is touching the foot, and the descriptions are completely different.

But as for the description of the cloud and the way Jean-Philippe was just describing, the two companies which ran into the cloud first and made the most traction, in terms of cloud applications, was Salesforce, and in terms of cloud infrastructure it was Amazon.

Of course, the company which is making the most effort to catch up and is making reasonable progress, I would say, today is Microsoft, with Azure and Office 365. That is actually what I meant when I said this. But I am sure other guys are trying to make efforts in the cloud as well. Like, for example, Google, it is obviously a cloud service. It was always a cloud company. It is not, per se, a cloud for others—it is a cloud for itself. But it can potentially make traction in the cloud for others as well.

J. Angwin:

Yes, thank you, Serguei. Also, I do not know if you noticed that yesterday or recently, Mark Benioff at salesforce.com said that they are moving beyond the cloud. The cloud is passé, and now it is all social computing.

S. Belousov:

Well definitely, if you look at what is happening today with IT, there are three major trends. One of the trends is cloud. But that is kind of the most benign trend. It is just kind of a new way of accessing computer resources. The other trend which is also very, very large, but is not so much fun, not so new, is mobile.

It is quite clear that in some, I do not know, five or ten years, half of the world's population will have some kind of smart mobile device on them, and that is a big change, because a smart mobile device is a smart mobile computer, whether it is a tablet, whether it is a smart phone. And it is a big change, but of course, mobile is also not so new.

The one thing that is very new is social. I definitely think social can be the largest, or one of the largest, trends in IT over time because it enables people to form groups and to communicate and to collaborate to do different tasks. Enabling people to communicate and collaborate better is always what has enabled the technology in the world to evolve, and social is something new.

But of course Mark Benioff likes to make a lot of strong statements. He has liked making strong statements before and continues to like doing so now. Maybe social is the same, but I do not really see Salesforce making that much progress there.

J. Angwin:

Okay, thank you. So, mobile is a perfect opening to Philippe Camus. Mobile is clearly the future of computing. I have three mobile computing devices in my purse, absurdly. But it is still relatively slow and difficult to access cloud services from cell phones.

As a provider of mobile broadband services, how soon do you think mobile will be ready to deliver the speeds necessary for cloud computing?

P. Camus:

Well, of course, yes, it is important because it is broadband and mobility. Today, it is still not really as efficient as it would be required. But, marginally, when you speak about cloud computing or cloud whatever, you need a network, and part of the new development, part of the new repainting of the cloud concept, comes from the fact that the networks today are able to deliver quality services, broadband bandwidths, and even for mobile. This exists already when you use a

PC with a CG card. You already have something. And tomorrow—and already today in the US and in 22 countries—we are deploying the 4G LTE generation of mobile networks, which provides the bandwidth and the capacity to deliver cloud services, even for households, I mean not only for businesses, but for households. And that is for me a key of the future development of what is called 'the cloud'.

J. Angwin:

Eric Schmidt said in his discussion earlier that our mobile phones were going to be a thousand times faster. That could not come fast enough for me.

P. Camus:

The new technology will enable you to have at least 10 times faster.

J. Angwin:

I think the problem is that in the United States, our cell service is behind on this. Tomas Kilroy, Intel's primary business has been building faster and more powerful chips for personal computers. Does the move to the cloud mean the endless race for increased local processing speeds becomes less important?

T. Kilroy:

No, as a matter of fact I think it probably becomes more important, just because of the sophistication of user-models. You think back to the question you asked Jean-Philippe about the old days of time sharing, when the devices were dumb, and all the power was in the cloud or in the mainframe. And then the PC came along and liberated the user, and the user has the capability to have a device where they can do what they want to do.

So I think today, users are not going to want to give that up. You mentioned you want a phone, a mobile phone, that is faster, and look at what Mark Benioff said. What he was saying is, "Cloud is really gone, it is now about social."

What does that mean? What that means is, if we are capturing a video or downloading a video on our device, that is going to make more and more processing capability as we share this in a social network: pictures, videos.

You think of the usages in business as well. You constantly, even if it is cloud-connected, you need to have that local processing, because you are not going to always have access to the cloud. Or even if you do, it might be too expensive. And you want to do that work on the device itself. I think that Moore's Law is alive and well, and that the additional processing capability we deliver to the client, much less the back-end server, is well needed.

J. Angwin:

Brian Bershad, Google's Gmail and Google Docs are probably the way that most consumers are aware of using cloud computing services today. But at the same time, hacking is on the rise, there have been an incredible number of hacking incidents recently, including the recent hack—the attempted hack—of Gmail in China. How secure are cloud services?

B. Bershad:

I am not sure the premise of the question is actually right. It is true that hacking is a problem today on the cloud. It is also true that hacking was a problem yesterday not on the cloud. And it is true that hacking is a problem today not on the cloud. So, bad guys are everywhere. One of the opportunities and advantages that the cloud brings to dealing with bad guys is that it allows companies like Microsoft, Google, Salesforce—the cloud providers—to put a tremendous amount of technology and security services in place, and to concentrate one of the hardest resources to find on the planet, and that is really smart security people, security people who are smarter than the bad guys, who are really, really smart, crafty, mean.

Without having that kind of defensive capacity in place, it is not possible to defeat, to frustrate, the bad guys. Google, Microsoft, Salesforce—most of the

large cloud companies can afford to have those kinds of defensive mechanisms in place to protect the consumer, to protect the business.

On the second category, the business: most businesses are not nearly frightened enough about how insecure their networks are, how insecure their data centres are, and how insecure their software is. They are not nearly frightened enough because, either they do not know how often they are being attacked, or they know—and many of you who are CTOs know this—or they know, but will not say. Because if they say, then their customers will begin to become very afraid.

Companies like Google and Microsoft and Salesforce are able to provide protection services for their customers who are using Gmail and Google Docs and, more importantly, are motivated to be very open when there are problems and to discuss with one another and to discuss with the customers what the problems are and how to go about solving them.

Eric mentioned earlier that we are on the way to being able to prove that somebody who says they are you when they want to come and read your email is in fact you. Today, I carry a little device that proves I am me. One is a picture that people look at; one is a little magic device that Google knows about, and unless I present, or somebody presents, this little device when I go read my email, Google will not show me my email.

The attacks that you described in China and many of the attacks that are described as hacking attacks on Google or Microsoft or any of the cloud providers are not actually attacks on the cloud providers. They are attacks on the individuals, where people fool the individuals—the bad guys fool the individuals—into giving up their passwords, into giving up their access. Companies like Google and Microsoft can use technologies like this at scale in ways that small companies cannot in order to protect the information that people care so much about.

So, I think we are actually in a better position with respect to the cloud and security than we were 10 years ago when your PC was wide open to anybody who could come and get to it.

J. Angwin:

As a follow-up, is it really the media? Is it our fault that we are publicizing these attacks more, and that individuals and businesses were not publicizing them before? And so it seems like there is this rise of hacking? Is that part of the problem?

B. Bershad:

No, the bad guys are at fault. It is not the media, and it is not the users. It is the bad guys, who are trying to get to your information. We are very open about when there are attacks. So, if anyone is then to blame for communicating that these problems are occurring, I would say we are doing that. We are letting you know that these problems occur. We are talking to one another. The companies regularly communicate with one another about what sort of issues they are seeing. I do not think the media is at fault—it is primarily the bad guys.

J. Angwin:

Well that is a relief. Usually we are the main culprit. Anatoly Karachinsky, IBS is the first Russian company to list on the Frankfurt Stock Exchange. How much of your business is cloud computing, and how big a growth area is it for you?

A. Karachinsky:

Thank you, Julia. I hear that people here are speaking about the cloud. We are a practical team, and I will answer about the cloud. I want to talk about what we do on the exchange, and I want to talk a bit about the cloud from the perspective of a company that uses it, because people talk a lot about the cloud as a phenomenon, as a social network and so on, but in principle, it seems to me that the cloud is absolutely a financial concept. I will give you an example: we had a big data centre in Vancouver, and we process almost all the world's newspapers there. They go through this data centre, we convert them to digital format and

many millions of consumers use them later in digital format or even in paper format, printing them in various countries. There have always been three heavy peaks when American newspapers come out. We had a peak somewhere between nine and eleven o'clock, when the newspapers come out in Europe. The same peak and the same thing occurs in Asia. We processed five to ten terabytes per day. On the one hand, we did not always have enough resources, but on the other hand, the most unpleasant thing for me as a businessperson was very simple: I spent money on people and electricity, and I paid for communication. I liked what Ryan said: we always feel the threat of hacker attacks, and most unpleasant for me as a businessperson was that every quarter, when I showed my financial reports, I then deducted depreciation from my profits, deducted virtual money, and reduced my profits by an amount equal to that of depreciation. Six months ago, we went over to Microsoft dubbing, and you know what was surprising? First, we reduced costs by about a factor of eight. People were paying about USD 60 thousand per month, but we pay Microsoft USD 4.5 thousand per month. Secondly, there is no longer a problem with the quantity of resources, meaning that, at peak time, we receive as much as is necessary for the processors, communication, and memory. Oh, and best of all, is that I stopped deducting several million dollars per month in depreciation from profits, so my profits increased.

Therefore, I want to speak about the cloud in terms of this picture. Imagine that there are two buildings, where the rent for one costs five or eight times less, and eight times more in the other. People are always asking me, "How quickly will the whole world start using the cloud?" I am telling you: you know, it is clear that people who keep track of their money and strive for efficiency and competitiveness will quickly leave the building where the rent was eight times higher and go directly to the building where the rent is eight times lower. This is the first picture that comes to my mind. We have quite a large back-office: ten thousand people work in the company, and about a hundred systems support the company's operations. We are also moving our company's operations to the

private cloud, and this also represents a significant reduction in costs. We believe that we will reduce our costs by a factor of five. It is, of course, very important for us as a company reporting quarterly, annually, and publicly, because it allows us to reduce real costs, show higher profits, show a higher EBITDA margin and increase our capitalization. That is how the cloud looks to us.

J. Angwin:

Well, I think we are all in favour of saving money. I think that is a great definition of the cloud. I want to throw one question out to the panel before we open up to the audience. I think the cloud clearly means saving money for a lot of companies, and also the idea of outsourcing your tech support to the experts at Google or somewhere else is a great idea.

The part that I wonder about with cloud computing is really the data. So, I am used to the idea on my PC that I own my data and I have control over it. The rules, at least in the US, about who can access your data on the cloud are not as strong as I would like, and I think that there is some confusion about who owns your data once you put it out on the cloud. And so, I want just to throw out to the panel the question of whether you have assurances about data security. And then we can move on to audience questions.

T. Kilroy:

Regarding the discussion about security earlier, I think regardless who the bad guy is, security is the biggest issue that enterprises have. And more enterprises are wanting to get the cost savings and the efficiency of cloud architecture. But for security and compliance reasons, they want to do it in-house—therefore a private cloud, which was on the video earlier.

So I think that is the balance: how do I become more efficient and have the cost scale like a Google data centre or the likes of that, but do it in a way that I have access and ownership of my data securely and I can also meet compliance requirements?

So I think that is the driving force, and why, to do that, we have to have open standards and allow for the efficiency so that enterprises can get the savings they need, the cost savings they need, as well as the security that they require.

S. Belousov:

I wanted to make a comment here. I think one thing that people should realize, and it was said a while ago, is that privacy is dead. Privacy died a while ago, but it has been killed completely by social, mobile and the cloud. And it is not an issue of security—it is an issue of privacy.

Today, and especially in the future, it will be possible to track every single word you say, every single word you write, every single place you have been, and it will be possible for a variety of different people. Of course, Google will tell you that they have security experts. But if somebody wants to know every single thing you do, they can hire someone and they will hack in and then they will be able to find out.

And one of the reasons why companies like Google provide you data storage, provide you access to computer resources and advanced services, is because they want to get access to your data. They want to know what you do because they can use it. I mean, they use it in a nice way. But still, the fact is, with the cloud, with mobile, with social, privacy is dead. Everything you do is known to someone, and you do not know how it is being used, and it is not regulated very well right now.

B. Bershad:

I would like an opportunity to respond. So there are several kinds of clouds. There are clouds for consumers, and some of what Serguei said is correct in that companies like Google and Facebook, we encourage consumers to participate in some of and use our products like search, because it helps us to deliver information to them, and it lets them do their jobs or go about their lives better. We use that information in order, for example, to give them better ads.

On the other hand, all of our companies provide services to businesses. And the cloud for businesses is really a very different story than the cloud for the consumer.

The cloud for businesses is, on the one hand, about saving some money, and I do not want to disagree with the panellists when they say the cloud includes some cost savings.

But the cloud is not, I respectfully want to disagree, about saving money for businesses—that is just a nice little side effect that some businesses are able to experience. The cloud changes everything. If you are doing the same thing on the cloud as a business that you were doing yesterday in your own data centre or on your own PC, then you might not need to be in the cloud.

But the cloud makes it possible for businesses to solve problems that they could never solve before; to answer questions about their customers that they could never answer before; to share information; to go social in the business, in a way they never could before; to connect 20,000 employees together, so that everyone at the company knows what everyone else at the company is doing or thinking.

Many of you have probably seen Benioff's demonstration of how they have taken Salesforce and combined some attributes of Twitter and mail to provide a very connected internal network for Salesforce's own employees, and now they offer that as a product.

We do the same thing at Google, many companies do that. The cloud makes it possible to do things that we could never do before in business and make businesses run better, make more money, and help their customers better.

Eric Schmidt mentioned a McKinsey report earlier today that says businesses which use the Internet, either internally or to talk to their own customers, are on the order of about twice as efficient, grow twice as fast, and sell twice as much abroad than those that do not.

That is only twice as much today and we are at the very beginning, so that twice will turn to four, will turn to eight, will turn to sixteen, and as we get phones that are a thousand times faster, we will also get businesses that are a thousand

times more efficient, which means that if you are a business and you are not in that race, you are going to have a lot of trouble competing.

So those businesses that move to the cloud to save a little money, that is a good thing to do, I applaud that. But for the most part, businesses that are moving to the cloud are doing it because it allows them to entirely change what they are doing.

J. Angwin:

Jean-Philippe, you wanted to jump in.

J.-P. Courtois:

To build on that discussion, I think certainly security and privacy are the two most common issues we have when discussing these commercial customers. I would agree that we need to differentiate consumers from enterprises and small and medium-sized businesses. As a company, we have decided to make some pretty strong moves, and we are basically providing contracts for cloud services, such as Office 365, which is a set of services where you have collaboration, SharePoint, exchange email, unified communication, and video web conferencing.

There are actually a number of clauses related to what can be done and should be done across the EU. There are actually a number of clauses where the customers, before signing, they have got their chief of compliance going and checking where the data are, what can be done, what could be accessed in case of emergencies and accidents, and what they would tell their audit committee if such a thing was happening.

And there are no secrets—otherwise, we would never have companies like Koch Enterprises—100,000 people in their cloud today working on Microsoft technology; Novartis—80,000 across Europe, Asia and America; and many others, because they check what is feasible and, obviously, as they agree, they understand that we have a strong commitment to them, and we have some

service level agreements to deliver that information, that service application, to the users with a certain level of security and privacy.

The second comment I would like to make is about business innovation in the cloud. I agree that it is just not about the cost, although the cost is certainly a good thing to take for many businesses, by the way. So I would not completely disregard that argument. Many businesses love to do that.

Let me just give you some examples of customers we are working with across the world. Take Mexico—a common issue Mexico has with Russia is there is a lot of what we call 'unofficial' or 'black' economy for small businesses, right? There are a lot of these people who are engaged in some economic activity but do not report taxes necessarily, so they do not exist officially. The government of Mexico gave a big task to the head of their tax system to optimize and start collecting tax from small businesses. And it was a big, big bureaucratic process—tons of paper. They never really arrived in the right place, and they did not collect much tax.

They basically asked many IT vendors in the industry, and the usual suspects—I will not name them out of respect—came back with a big order with the use of the centre that they were going to create, with 18 months of work.

We worked on a platform called Windows Azure, which is a development platform in the cloud. In a matter of five months, our team with the customer-partner developed this end-to-end process which is like the one in Mexico, which is scaling incredibly, meaning that they started to use 300 transactions per week, now it is thousands, and hopefully they will reach millions, which would mean they are going to get many more official businesses in the country.

And it is costing them, by the way, much, much, much less than what the usual formula by the usual suspects was supposed to do for them. So I call that business innovation. You transform a process. You really scale it and develop the application from scratch. It is not about moving an existing application. It is a new one, and it is using the all the computing power of the cloud. The customers

will not have to buy tons of servers; you are just using the capacity and technology to run that application, a critical application by the way, all the time.

So to me, that is another colour of the card, which is yes, it is money as well, but it is also transformation of a business.

S. Belousov:

My colleague has mastered the Henry Kissinger rule, which is to answer not the question which is asked, but to answer the question you want to answer.

J. Angwin:

Philippe, you wanted to jump in?

P. Camus:

Yes, and I will answer the question.

J. Angwin:

Oh, good.

P. Camus:

On privacy, it was a question marginally of security of our system, and we have been concentrating on keeping the data where they are and to protect them. But, as you know, before going from this point to another, the data are going through the network. And due to the development of the traffic, which will be enormous in the next five years, the risk will be much higher when the data are travelling along the network than when they will be stored somewhere.

That is something we are developing, and not only Alcatel-Lucent but also their equipment provider, in order to add to the network the capacity to detect and to monitor in advance the problem of security and data protection. And that is something that will be much more required in the next years to come, especially if you start to have a generalized practice of paying with mobile. You can pay in

the shop with your mobile, and that is something you absolutely need to protect. And that will be in the network itself, not only at the end.

J. Angwin:

I look forward to that. I have been waiting for someone to make me an easy-to-use encrypted email system for quite a while.

I want to dive out to the audience. We have a couple of people in the front row who have some interesting things to add.

I want to start with Viktor Orlovsky, who is the Chief Technology Officer at Sberbank, and was telling me earlier about the risks of the cloud.

Do you have a mic?

V. Orlovsky:

So if you do not mind, I will speak Russian, because the audience is Russian. I think it is better to switch into Russian, and we will just shift directly to the question you raised.

Now, the risks. I would like, perhaps, to talk not about the risks per se, but about the opportunities that cloud computing clearly provides, and about the problems that arise in connection with this. I will speak now not as a user of many cloud sites and services, but as a manager of a large corporation. For me, in many ways, the cloud is about marketing: respected vendors sit around and think up beautiful, appropriate titles—bellefusion, cloud—the more vague, the better, because it is more difficult to explain. As a manager, I deal with very specific problems: a large number of applications. Sberbank—an old bank, which is already 170 years old—has developed quite a lot over those 170 years, and it all works in its own technological environment. There is a lot of server hardware and it is vital to continually improve the productivity of some equipment. Some of the equipment sits idle, practically unused. There are annual average peaks: when quarterly payroll or yearly bonuses are paid out, but we buy the equipment necessary for such a peak, and at a small margin. Clearly, I am interested in

using the infrastructure offered by the developers, when I can shift on-demand capacity to any of our infrastructure servers. Obviously, it is very interesting to offer clients cloud services, such as a client bank, where you can buy services separately, not as an entire package, but a certain number of services, then forgo a certain amount, modify the bundling, and so on. This is very interesting. My question is, where is the application?

Today I cannot find the application on the market. For example, bank processing. Show me bank processing that works with cloud technology. I would happily buy it and begin testing it. Show me core banking that works with cloud technology. No such system exists today. Even those who come in and tell us what this cloud is are again talking about instances of databases, that there should be one instance, perhaps some kind of Rio Application Class, if we are talking about Oracle; well, three or four servers is not a real cloud—it is still a limited infrastructure, and we are nonetheless talking about very specific architecture, and this is also not a cloud. That is, we see a lot of marketing, but we do not see real applications or systems to which we could move. And, unfortunately, we have already seen attempts to wrap up enticingly in nice marketing something that really is not a product. Therefore, it is still a question for me. Clearly, we use the cloud internally as social media. We are actively trying to work in the private cloud and to enter the public cloud, and we are actively working with a number of corporations that are present here (we will not name them individually, but with almost all of them). However, for our industrial systems, we do not for now see anything that is even close to the cloud. I think the biggest risk is that these applications will either appear late or not appear at all, and the world will jump into some other medium—from the cloud to the universe, then from the universe to somewhere else. The world is changing so quickly that technology will not have time to take hold before something else appears. This may not really be an issue, but if someone wants to comment, I would be happy to hear it. Thank you.

A. Karachinsky:

I can comment on this. You know, I think that you have greatly complicated the issue. What do we see today? Yes, we are working with 14 of the largest banks. I can list them, but it is probably not necessary. To date, this is just an environment that much more effectively manages the infrastructure than the old architecture did that existed before. Simply put, it works significantly more efficiently, in terms of hardware costs. Before, people bought servers, but now you have the opportunity to send the application. Of course, it has just appeared, and, of course, there will not be any commercial applications. What we see now is that the majority of large companies (and the corporate world, as we well know, is significantly larger, in terms of money, in terms of work in the area of a transition from one condition to another, it is a huge world) is now working on a simple question: how can they move what they have now to some other environment, where they can spend less money to support it? This is a very interesting question—a question of safety and of integrity—because we talk a lot with clients who are trying to figure out what to do: build a private cloud or use the public cloud. Nevertheless, everyone is making this move now, and everyone is starting to go where it is cheaper.

The question is: what is next? If you have your own systems, you need to modify them somewhat, in order to reduce costs. There will be huge savings today in money previously spent on operations. We see big clients—banks, for the most part—and a part of the money they plan to save in the short term, and how they are starting to launch development of their own key applications, with the applications being re-written. Of course, it is hard to write fully-packaged products, and most likely there will not be any in the near future for these giant companies, but they will certainly appear for small companies. I think it will happen very quickly. Today, the competition between banks is on the level of 'who has the best application'.

You know, I tell everybody about my conversation with a person who runs a pawnshop. We asked him, "What makes you better than everyone else?" He said, "You know, we are the same, we have the same stores as everyone else,

but we have a program that manages inventory. It is the best in the world, and so we have 2.5% more profit than any other retail network".

The same can be seen in any other industry. Today, applications are the tools of competition. You say: "Give this to me and I will buy it". However, if you want to compete... Imagine that there are two banks that have exactly the same applications, everything will be the same—how do you compete? Maybe your money might be cheaper. But no, if you are not in the market, then this is the government sector, and the money will cost just as much as it does for everyone else. Therefore, business processes, ideas, innovations and, as a consequence, the programs or applications that you are talking about, that implement these business processes, are your competitive advantage, and no one will sell them to you. Imagine, you go to Citibank and say: "Sell me your system, as it is very good".

From the audience:

And they will be happy to sell it to you, for sure.

A. Karachinsky:

No.

S. Belousov:

In fact, they all say that the cloud is about saving money. Of course, they want to deceive you. IT-vendors are sitting here. We sell IT. We in no way want you to save money, we want to get more money from you, we do not want you to save money. Because if we save you money, our business decreases. So why would we sell you something that decreases our business? That is why the cloud is not about saving money. This is, perhaps, about scale, but mostly it is about the fact that it is possible to do some completely new things faster and more easily. Faster, easier, more flexible, but not cheaper.

V. Orlovsky:

Sorry, colleagues, a last remark, so as not to enter into the discussion. I absolutely agree with both Anatoly and Serguei. I am talking about the same thing. I am not talking about savings, but about the fact that I also want to enter the cloud, but do not know how and nobody is offering it to me.

S. Belousov:

It is a natural evolution: first infrastructure, then the platform, and then some vertical applications, such as mail or CRN, and then some other applications. We already have the infrastructure, we have platforms like Azure and Amazon, and now we can build some applications on those platforms. There are plenty of types of ISV or system integrators, such as Anatoly, which builds applications for you. They simply have not built them yet. That is fine. Sooner or later, they will build them.

V. Orlovsky:

We look forward to it, and we are ready to take an active part, putting up money, as well. Thank you.

A. Karachinsky:

One small comment. I just saw eight major projects: Boeing started a large private cloud project, and several large banks have already started projects. In these projects, people are trying to assess what the move will cost and what the savings will be. I am not selling anything, as I am not a vendor, and I am not even an integrator in this case. I see myself as more of a software application developer, so I just see real-world projects, of which we now have dozens. They are all Western—and in Russia, we have not yet seen a single project—and we see real savings in all of them. I spoke about my project, which saved about 4 million a year on the processing of newspapers, once we moved to Azure. For me, this was the solution to a colossal problem. I have already forgotten what it

means to buy equipment, and I have forgotten what a back-up is. For me, this is a great solution, since I do not have confidential information there. I have newspapers, ones that can be bought, and are all public. Clearly, the situation for private companies—for Sberbank and other banks—is different. Nevertheless, it is a huge saving for everyone. If you earlier used to buy one server for each task, and hired a bunch of people to manage these servers, upgrade them, do back-ups on them and so on, now all of this work has been greatly reduced. The important thing is the extent to which you can efficiently build your own applications, which will use those remarkable things that everyone here is talking about. Of course, the cloud will change business processes and customer service capabilities, and much more, without a doubt. There is a competition for innovation in your business, for new ideas, for exciting new inventory or other wonderful things, and nobody has to think these things up for you. Whoever comes up with them first and whoever is the first to invest in them the money saved on infrastructure first, that is who will win the competition. This is normal.

B. Bershad:

May I?

J. Angwin:

You wanted to add a comment? We need to open for questions, so make it fast.

B. Bershad:

Very quickly. The cloud is still something new for now. When it comes to new technology, it always takes time: it is necessary to adapt, use, and learn how to do it. Forty years ago...

the first computer, UNIVAC, it was used in the horse racing industry. They saw an opportunity. Banks were very slow to use computers, they were afraid of the technology. Eventually, it became a matter of survival. The new banks that used it did well; the old banks did not. We have seen in the US much of the same that

you are describing here. Parts of banks are moving to the cloud, the ones where speed and decision-making matter. It is often not an issue of cost, it is an issue of staying ahead of the competition, like on Wall Street. There are other parts of banking, the parts that keep paper in large metal boxes, which move more slowly, and they will eventually move because someone will come along who keeps paper in a large metal box and figures out how to use the cloud to keep their paper in their large metal boxes more efficiently and more securely than their competition. It is a matter of time, and different industries will move along at different speeds.

J. Angwin:

Can we take questions from the audience now?

From the audience:

Hello, I run ABBYY, and we are the kind of company that makes products. Of course, we already decided at least two years ago that we need to be actively making products for the cloud, as well as for mobile platforms, as this is a clear trend, moving advanced computational processes in these two directions: mobile platforms and the cloud. However, we carefully examined the needs of users and the overall nature of the cloud today, in the process of designing these products. In particular, in terms of cost savings. In order to save money with the cloud, you need your project to be dynamic. It must adapt quickly. If it has that property, and if there is some dynamic change of consumable resources in the framework of that process, then the cloud is simply a saviour. If you have a stable process that requires the same capacity all the time, which needs only be installed once for it to go on working in that mode, then, clearly, attempting to purchase this process from someone will result in an increase in costs, as they are not giving it away, after all. That means they will do the same thing you are doing, and they will still have to sell it to you. However, if the situation is dynamic, you simply cannot do without the cloud. Dynamism is really a very important factor in making the

decision to begin using the cloud or not. Therefore, there are two categories of potential consumers for the cloud. The first is the start-up, which is when you begin doing business and you do not completely understand yet how quickly it will develop. Buying infrastructure for this is simply not realistic, so to speak, as this is a very substantial cost. That is why launching a start-up in the cloud is simply wonderful. The second potential business category for which the cloud works is that where the workload is dynamic. Actually, as Anatoly said, there are peaks and when you are forced to buy expensive hardware for these peaks and then later support this hardware, you are not using it all of the time at 100%, so this is the very scenario where you can dramatically save money. It is a very good story. It is precisely this that we have in mind, in moving our products and, of course, it will come out sooner or later, although the client is still worried that not everything is in place. But the question I have that really worries me, and I think the entire audience, is whether the suppliers and service providers of the cloud, for example, Google and Microsoft, can give a written guarantee and undergo, I do not know, some public audit about this, to guarantee that they agree not to use the data that is in the cloud. Not to use it in any way. In addition, are they ready to be audited and transparently follow any guidance they are willing to sign. If not, then you know what that means.

S. Belousov:

I think that, in the beginning, when banks went over to using computers, they also thought that computers should be used only for certain tasks, while other tasks needed to be carried out using an abacus. Nevertheless, after a while, they began to use computers for all tasks. It is just a question of the price of a computer. The cloud is cheaper. Let Microsoft and Google answer for the rest.

B. Bershad:

It is new, young. Some processes are very static. They may be best served by the way you are doing it today. For your dynamic processes, where there is

innovation in either business model or technology, I completely agree. I think what ABBYY soft has done is great in moving pieces of its business to the cloud. The question about guarantees depends on the business risk that a company is willing to take and the benefit that they will get back from taking that risk. There are some businesses today that refuse to take risk, and they may never be well-served by anything that they do not completely control, because they believe that they understand the risk there.

As businesses become more comfortable with moving onto the cloud; as they become more comfortable with the processes and the technologies, they will make a decision about risk versus reward, and they will decide how much they are willing to invest.

Some businesses have already made that determination. I think we mentioned Amazon earlier as being just a great leader and bringing startups onto the Internet, onto the cloud. Other businesses are slower. It is just a question of balancing risk and return.

S. Belousov:

It is kind of like selling your soul to the devil. The devil will sign the contract, but who will enforce it?

J. Angwin:

Jean-Philippe, you want to address the security guarantees?

[QUESTION IS REITERATED]

J.-P. Courtois:

Let me try to be practical, let me try to respond to the question. As a company actually in Europe, there has been a lot of discussion for a number of years on privacy, for consumers in particular; now we are moving to business. But as a

company we made a decision about 18 months ago that the data retention—basically how long we are going to keep the data—will be six months.

And number two, we have full anonymization of the data, of the IP address. We do not keep any identifiable information after the six months. I feel we are the only company that made that commitment to consumers. So that is something we did. Consumers know when they use the Microsoft card service that they have got that.

On the commercial side, business is paying for the service—there is a contract. I was mentioning that before, so you have got audit clauses, you have got security clauses, and customers can go and check, decide, depending on their risk level adversity, which is a fair comment, if they are ready to move to the environment with all the guarantees we give.

The last step of the guarantee is that we have a service agreement with a 99.9% service guarantee, and if we do not deliver the service to you, to your users, we give your cheque back. Those are Microsoft's guarantees to the customer.

B. Bershad:

To be careful, contracts and guarantees are different. I believe we all offer contracts, and they are very, very important. I just want to make sure we do not interpret a contract as a guarantee; if you are looking for a guarantee, I do not know where in the world you will find a guarantee about anything, about the cloud, about whether those lights will stay on, whether the room will stay warm or the sun will rise tomorrow.

Contracts are fantastic business tools and we are all using them. And many of us are using them in the cloud, and we will continue to see them evolve. And I think it is great that Microsoft offers contracts. Google offers contracts. I imagine the rest of the companies up here also offer contracts to their users about what they can expect and what will happen in the event that a particular level of service is not delivered.

J.-P. Courtois:

I just recommend you to check contract-to-contract, that is all. I will stop there, okay?

J. Angwin:

That will be our next panel, the side-by-side comparison. Okay. Maybe we can get another question?

J.-P. Courtois:

Second question.

J. Angwin:

Second question, yes. From Elena from the youth forum.

E. Kvochko:

Thank you very much, Julia. I was a participant in the Youth International Economic Forum here, and I also work at the World Bank in the information and communication technology sector unit. We talked a lot about the effects that the cloud can have on companies, but also cloud solutions are now actively adopted by governments throughout the world, and not only rich governments, but also governments in emerging economies.

And I would just like to illustrate with a few points the effects that the cloud can have on national economies in emerging countries, developing countries, so to say. The World Bank is now working on a project in Moldova and we are introducing a government cloud there. According to our estimates, the following effects can take place: we think that the total operating costs of maintaining the IT infrastructure in Moldova will decrease by nine times. The second point is that, due to the use of new cooling technologies and due to the use of green servers, the total consumption of electricity by the IT industry will also decrease from approximately USD 3.7 million per year to USD 250,000 per year.

And the third point is that, because most of the software will be stored and processed in the cloud, the government will not need to buy expensive work stations for their employees. So the cost of a work station will decrease from approximately USD 1,000 to USD 200 after the implementation of the proposed cloud solution.

And also of course we need to bear in mind that government agencies are a little bit slower to adopt new technologies than private companies. And that is why the important thing is to implement this cloud solution in a phased manner so that different agencies can adapt to the new demands and new technologies. And, just to conclude, I think that the government transformation—the future of government transformations across the globe—looks cloudy. Thank you.

J. Angwin:

Thank you. One more question over here?

From the audience:

Thank you very much. To some extent I have to agree with Anatoly Karachinsky about what we have discussed so far, which is simply that cloud computing lets you do the same thing bigger, faster, whatever, for a single company. Where cloud computing becomes interesting is when you can combine the data or the applications across different entities and so you get things like not only can you manage your own inventories, but Google or Bing could come along and enable a consumer to compare the inventories and stock at different stores.

So I am curious if someone on the panel—maybe Google or Bing, or maybe somebody else—can talk a little bit about the new kinds of applications that are enabled by actually using the cloud as a cloud rather than as a more convenient back-end.

P. Camus:

Julia, may I?

J. Angwin:

Yes.

P. Camus:

I had one which is not directly on the business side but concerns everybody. It is telemedicine. Telemedicine does exist, but it can be done using cloud-like technologies, using HD video, using a comparison of data which could be in a different location, by a personal physician, but also in a hospital somewhere. Or having the ability to have a direct comparison of different experiences, all that is cloud as we define it today. And that is something which will be developed along the same story, because of the mobile, because of broadband, you will be able to deliver a telemedicine capacity almost everywhere, at any time.

And it will help developing countries, because in emerging countries you have not so much infrastructure for medicine.

T. Kilroy:

I think the answer to the question is: There has to be a federated cloud, because we are talking about, you know, most of the discussion has been about the public cloud. The reality is that there will be a private cloud in most enterprises. And the other reality is that there will be a hybrid as the video showed—back and forth. And that is what you are saying.

It has to be a federated cloud, where the applications and the software really are shared, and the only way to do that is to have standards, open standards. And there are bodies in place today forming to do that, to develop standards, so that there can be that sharing, as you said, so that business can get conducted not just within a firewall but across firewalls. And that is a reality that needs to happen.

J.-P. Courtois:

Maybe just an additional example I would give. I recently met with some fascinating people at CERN and discussing with them the way they actually do what you said, which is connecting the dots between their private cloud, which is quite, quite unique, with the public cloud capabilities, either Microsoft cloud or others, to actually do tons of data-processing, particularly given the huge project they are running there, it is just fascinating. And this is where you see, you are absolutely right, the power of extending that capability outside of the private cloud to the public cloud and tapping into a very distributed environment where we could use those resources in a very incredible way. I see a lot of projects also on research, biotechnology. In those scenarios of high performance computing, there is a lot happening.

Or insurance, I was talking to a friend at Sberbank and, in the insurance industry, like in banking, they are starting to move into the cloud with cleanse processing applications, connecting agents, customers and the banks all together on scenarios to expedite the claim process. That is starting to happen.

B. Bershad:

Can I add just one bit to that quickly, describing the general scenario of big data?

S. Belousov:

I think everybody is forgetting about small business. Everybody is talking about big data.

B. Bershad:

Esther, your question was really about big data and how the cloud facilitates using big data. You gave one example product—search—and that is a product that is something that Google offers. Vendors send us information about their pricing—physical vendors—and we deliver that back to customers.

There are multiple relationships that exist, and in many cases they actually send it to us.

The second example, I know you want to cut off, but I think the second example goes to industry companies where, not only do you have big data, but you have the big join. And the big join is one of the really fascinating new opportunities a cloud makes available. Very few companies are taking advantage of that now; over time we will be seeing that. Join over 10,000 SQL databases in an instant. It is pretty fascinating what you can do at that level.

J. Angwin:

Okay. Thank you very much. Sorry to cut you off, but we are under strict rules to depart. So, thank you all, it was great, and we can continue the conversation outside in the café.