Fireside Chat with Niv Zilberman, General Manager of Business Innovation Office at Intel, and Thomas Neubert, Senior Director of Strategic Business Development and Innovation at Intel

Video Transcripts

Olaf J Groth PhD: Okay! Welcome everybody to our course Future of Technology. This is Olaf Groth, your instructor for this cutting edge new avant garde course by Berkeley Executive Education. I'm very glad, very pleased, and privileged in fact to be joined today by two high powered executives, good friends of mine that I'm bringing to this course and I'm very excited that you all will get to hear their thinking.

First there is Nick Zilberman, who is the general manager of the business innovation office of the data platforms group at Intel Corporation, which most of you may not know, is a very big business unit at Intel. We know Intel mostly chips, but that has been changing and is as well Thomas at the forefront of changing that incubating new ventures for current but also the next horizons two and three. And we'll be talking about that. Nick is also sort of your commensurate risk taking entrepreneur has spun out, stood up, and sold a few ventures successfully, was part of intel's M&A group, one of the M&A groups, and now the incubation group for the data business unit. Welcome Nick, thank you for joining.

I'm going to now introduce my good friend Thomas. Thomas and I have known each other for a couple of decades and Thomas also is a commensurate entrepreneurial executive, who has stood up a number of ventures, led business development, sales, venture development for a number of different areas, amongst other things for Deutsche Telekom, where he was a Vice President, but also for Logitech and a number of other well known companies and startups before joining Intel. And he now leads business development for the incubation group, and so is at the very forefront of looking for new ventures to incubate, stand up, and lead us into the new frontier. So Thomas, thank you and welcome to you as well

Thomas Neubert: You're welcome. Thanks for having us.

Olaf J Groth PhD: Absolutely we're privileged. So let's dive right in you to have whatever consider some of the most exciting roles that you could have at any large corporation right. Your discovery, you're right at the frontiers of technology and that's what this course is all about. You're discovering and then you're bringing it back and you're growing it right. What's more exciting than that at least in my book. If you could maybe just say a few words in your own words and we'll start maybe with univ about the role of that unit at Intel and Thomas if you want to chime in and then we'll dive into the actual technologies.

Nick Zilberman: Thank you Olag. First of all thank you for the opportunity. We are excited to be here. So yes, if you think about kind of the future of technology of the future computers. Right so first of all we are in the middle of what we call the fifth big revolution, it could look in agriculture, of course, the industrial, the PC, the Internet, the AI, the big data is coming. And the fun part is that computers are everywhere. Everywhere, they're around us, surrounding us we call it from the edge to the cloud from the autonomous driving and the flying cars, all the way to the hyper scale or those army what we call of this big data centers that spread across the globe.

So computers are everywhere. And really the thought process of we, just in Intel, and me personally I'm fascinated with how computers really change our life right, and I think we were all witness in the last kind of 12 months. You know how technology kind of took over some of the maybe in person communication or filling some of the gap. So definitely we see today the power of computers right. The power of computing the ability, to process data to move data, as I said, from where the data is being generated. There is a famous phrase called data is the new oil, which is all about data and data.

So we really here at Intel, specific for what my group is doing, is really looking for the next big thing, what else can we unleash, where is this next big thing that we can discover using computers because the fact of the matter is right we're at Intel's, we love moore's law. It's an exponential growth if you see over the last 30 years and now the ability to lead research in vertical areas but specific for what we are interested right, resolving those big questions and really help society is, we believe that computers can definitely reach you know every person on earth. So our charter is we say it is really look at what we call from the far edge where data is being generated, the massive data around us all the way to those big hyper scale or you know with the cloud as we call them and everything in between.

Olaf J Groth PhD: That's you know fascinating because it's sort of building right. It's building the engine of society, as it were, you're right there in the engine room and you're building a new engine. You're talking about edge computing already, and of course we deal with that extensively in this course as well Describe for me the edge computing. Like what's exciting about it? What's on the horizon? Where's this going? You know how does it fit with maybe computing edge in the data center itself. You know, take me out there, if you will.

Nick Zilberman: Okay, so this is a great question. So first of all when we talk about edge, we need to talk about data in the ability to capture the data what we call with the lowest latency possible. Right, if you think about autonomous cars or flying drones and what we call the real time application, that really need the data to be processed in real time. For that to happen, we need to bring the process of the computers as close as possible to the original, where the data is being generated. This is for us we call it the edge. The edge can be the car that drives itself, but it has enough computers, a mini data center. We talked about smart cities and smart manufacturers, etc.

The idea is to bring the computers the ability to process, to store, and move the data as close as possible to the originator and and that what we call the edge. And of course we kind of can break the edge into more than kind of one physical location. Of course, we said the really kind of real time application that needs to be processed on demand, and we always go back to autonomous cars. But then we can start looking at what are called the city data center right.

Mainly in PRC we see that are there like cameras everywhere. So the ability to put sensors and spread sensors across city to make it safer etc. That's for us the data, the ability to put the compute power that is needed, can be CPU, GPU etc, not necessarily that type of the workload the data, but the ability to be able to access the data as close as possible to real time. That's what the new edge is all about.

Olaf J Groth PhD: And what you're saying is really as we're as we're automating everything in the city and everywhere else right then low latency really matters right. And that's why you're taking compute power to the edge. But aren't you also limiting what you can do on the edge, because in terms of you know, new types of value equation, because you know there's only so much compute power, you can put into a handset let's say right. Do you have any plans to sort

of close that gap where you're saying, look, we can actually put a real supercomputer into your hand at some point? What's the plan to give both power, as well as low latency to the edge?

Nick Zilberman: So this is a great question and the short answer is that's really our vision. Our vision to make sure, because it's not a one size fits all. It's not like just take one set of computer and put the necessary compute processing power and just make it suitable to all what we call the workload. So what we're looking here at Intel, I think the industry is pushing us to make sure they said that do you'll have enough supercomputer available on demand to your needs.

So we talked about the edge. Now let me introduce what we call, we have the far edge. This is really as close as possible, and then there is some sort of an aggregation in probably some sort of city level where we can probably apply more of those supercomputers not necessarily the palm of your hand or in your car in your robot, but close enough to you that we can deploy and apply more compute, more power, and more processing to process the data. So the thought process and going back to more as low eventually supercomputer in the palm of your head, then we are on this journey in the front end. And while we're on this journey, the idea is to process data, as I said, bring the computer to actually would the data and the processes needed.

Olaf J Groth PhD: In order to accomplish that and do you need to do you need to go beyond current physics current architectures? You know people always talk about quantum computing right, but there is many different types of technologies that are on the horizon and I'm wondering if we're into new physical or physics territory here or what's the alternative plan?

Nick Zilberman: So this is a great question again. My group in specific, we're not dealing with quantum computing yet. Intel has a massive lab, what we call the Intel Lab that they just I believe announced. You know Intel is making great progress in quantum computing definitely quantum computing to resolve more of the complicated research stuff beyond where we can touch it now. So me personally, I don't see quantum computing being available as personal computing right let's say in the next 30 years. So we are still going to be heavily rely on transistors and Moore's Law right, in order to shrink it and deliver better performance, better power. And that's where I see kind of the journey in the next 20-30 years, knowing that eventually we as a society would like to process data at the speed of light that currently we don't have with the current technology.

Olaf J Groth PhD: Okay, thank you for that, and maybe Thomas, I could ask you, you know what's going through my mind right now is how is this relevant to an executive who is not a tech executive like an executive in tech or maybe an IT executive in a large non tech company. Can you take it down to an industry level for me? Give me an example. Why would this be relevant? Why would people care you know make it really sort of hands on for people?

Thomas Neubert: Yeah, it's a good question too. It leads based on the conversation you guys just had. I would say, if you look at technology, it drives everything and it's everywhere right. So people have to recognize you just can't do anything building a business maintaining a business without understanding and adopting the new technologies: artificial intelligence, we talked about latency, we talked about data centers, and the edge. But let's also maybe separate this for a second. There's the development and the implementation of technology and then there is the consumption side of the technology.

And executives, who are not necessarily on the geeky side, on the technology side, but they are on the consumption side, and this is pretty much everybody who was running a company, one

way or the other. They need to be aware of what technology is coming, what technology is available for them to actually enhance their business to do you know new processes, to pivot the company into new areas that they may have not been looking into in the past.

So we just mentioned autonomous driving. Think about what we just said about latency. The combination of artificial intelligence, data center, low latency which cannot be done without the introduction of 5G, but the combination of all of that is what will enable a giant change in mass transportation and city development. So people who are in these areas, they need to be aware that these new technologies, not just individually, but even combined are pivoting something that just hasn't been done before, and it wasn't able to be done before in the past.

You take healthcare, you have you know early Alzheimer recognition, you have prostate cancer diagnosis, you have climate mitigation with you know, smart resources and sensitive farming, for example, agriculture is something very, very big. So if I would be a farmer, would I think about technology and data centers and AI today? Probably not. Do I need to talk about it to stay competitive and 5 to 10 years from now? Absolutely. So they are, I would say, every aspect of our life, every aspect of us--human beings, life science, healthcare, autonomous driving--will be affected by artificial intelligence, quantum computing. The power is being required and needed everywhere: from the edge, all the way to the data centers. So yeah if you are a person who is managing a company today, no matter what, if you run a farm as an agriculture, you need to be aware of what's coming.

Olaf J Groth PhD: It really I mean what you're saying, it really changes the infrastructure layer in your company, it changes the operating layer. It changes, you know even frankly business models right, and if you don't want to change your business model as an executive in whatever industrial farming or in healthcare, some disrupter will probably take that up and do it with these new capabilities right.

Thomas Neubert: Exactly and that's what's important that people need to recognize. They cannot just sit on whatever they may have done in the past, even if they are market leader in whatever segment. There is going to be a disruption coming enabled by high power silicon, data center, cloud services, diverse data centers that people can just quickly tap into to run software from remote for testing purposes and on the consumption side, combined with AI. People will adopt it and if you don't do it, somebody else will and they will run you over. As history has shown many brands and companies in the past to some extent, they don't exist anymore because something came from left field and they didn't see it coming.

Olaf J Groth PhD: Yeah, so if you don't understand the underlying structures and the underlying structural changes way down in the bowels of the iceberg and you just look at the tip of the iceberg, then you might as well right run into it right. So yes, absolutely I get that. You know I know there's another topic here also. This is not just game changing for companies, for industries, this is also game changing for society at large and if already mentioned Smart Cities right. I know a topic near and dear to your heart and my heart Thomas is climate change right. Are you looking at that, as a vertical or how do you look at that?

Thomas Neubert: Well, climate change is a big topic right. But so it's like smart city, for example, there are so many areas within smart cities. We have a 5G division, you know we have wi fi here ,we have PCs on the edge, we have an IoT group, which is a gigantic multimillion dollar business within Intel and then you have the PCs, the workstations whatever. In climate change, I would say there isn't a group called climate change right. It's like video, it's not a vertical, it's actually a horizontal overlay. We have a group that does video surveillance and all of that stuff.

But it relates for retail, it relates like people counting it, logistics for data warehouse management and robotics, for example. It's traffic control, so it's an overlay.

Climate change I see it a little bit in the same way. There's many, many aspects of climate change that will be changed and I truly believe one of the biggest opportunities for humankind to tackle finally is the enablement and the adoption of artificial intelligence to address problems related to climate change. Agriculture is part of climate change, if you really think about it right. Waste management is part of climate change. So there's so many things that can be done under the umbrella of climate change and I'm coming back to what we said before there isn't one aspect that you could mention that the technology will be affected by, no matter what. So yeah climate change is a big deal, but there are many, many, many facets underneath it yeah.

Nick Zilberman: If I just add to it.

Olaf J Groth PhD: Please.

Nick Zilberman: Because this kind of topic is close to my heart. Within my innovation group we are looking right, specific we look into the climate change and specific about reusable energy, the ability to reduce overall carbon footprint. Sustainable energy, we talked about the demand for high power compute, we talked about the ability to process everything, that doesn't come for free.

So here at Intel we're taking it extremely seriously. Me personally, I definitely see in the near future, where customers would like to run the workload based on the carbon footprint that this walk would live you know, outside of the data center. So one end the demand for high power compute. We wanted faster, we want it now, we want more course. We call it here in an Intel more silicon.

And in order to do so, we need to inject more power. And more power, of course, we talked about pollution and everything. So I agree with Thomas it's not just one group. But sometimes I say, if you are the problem, you better come with a solution. So here at Intel, this topic's close to our heart because we do believe that with the demand, almost the hockey stick we call the demand, for high power compute. It's our responsibility to also look at how we can make the entire right universe green usable energy and, overall, reduce the carbon footprint that's basically being caused by our own kind of CPUs.

Olaf J Groth PhD: Clearly, Nick and Thomas told us this is going you know way beyond you know the old Intel right now chips and desktops and laptops. You are at the frontier, as we said earlier, and you described a little bit what your organization does, but dive in for me how are you helping Intel forge into these new horizons? How does that integrate with the existing business lines right?

Many of the executives with whom I built capacities have exactly this question on their minds right. How do I upgrade my own product portfolios. How do I, in essence, disrupt myself without cannibalizing my existing business that earns me the right to innovate right, and that pays all of our salaries, as it were. So how do you do this? Obviously Zone to Win, Jeff Moore's concepts and latest book are at the core of this, but how do you implement that.

Nick Zilberman: So, since you mentioned Geoffery Moore right. We built this group, based on the zone to win right. That philosophy, I will say we took kind of page from Geoffery's book and we're bringing to life. And I truly believe in order to innovate in big corporations, what do you

need? You need focus. You need patience and we call it or Geoffrey calls, you need to re-fence yourself. Both from budget, from headcount, and the name of the game, as we call it look at horizon 1-2-3, is be able to disrupt the disrupters. Right being able to disrupt what's being done in the performance zone or the productivity zone.

How do we do it? As I said right, so we re-fence ourselves with the budget, with the headcount, we use [inaudible] based funding. We're trying really to implement some of the ideas and we bring it to life. So just the ability to run a budget, run a group that is outside of the performance zone. In other words, our group, not necessarily is on the hook to deliver every quarter right to our shareholders, so that gives us right a little bit more of a runway and the freedom to go and innovate.

The name of the game is to fail fast. So bring first the budget, put a dedicated headcount in place, put the new kind of reporting structure deferring in the book talks about building a board of directors. We actually built a board of directors. So my group personally I report to a board of directors every quarter that judge me instead of using right the SAM and the TAM, the traditional logical of the performance zone. We kind of took some of Geoffery Moore's trap value right, the 10X factor. It's [inaudible] based, so I'm really looking at a Jeffrey in the Zone to Win philosophy to help us deliver and destruct big innovation in a big operation.

Olaf J Groth PhD: It's exciting new territory right. It's a really tough balance for organizations to you know to wonder and navigate. I wish you best of luck with that, because certainly I'm a big fan of his concepts and I will welcome him in this course as well, and we hope he'll be able to have one point at some point quote yet another successful example of how to implement these concepts.

Let me ask you. Is there for the soul or realm of the new edge in computing, is there a potentially very good future and a potentially very bleak future? In other words, we always as business people, of course, we want to navigate toward the positive future, but we have lots of uncertainties, lots of disruptions happening to ourselves. We know geopolitics right now is in the way of global semiconductor supply chains, for instance, right. Can you imagine a positive and a negative, so the thumbnail future whoever of you gentlemen wants to tackle that one.

Thomas Neubert: Go ahead.

Nick Zilberman: Right so again, this is a great question. If I'm thinking about technology and I think we all can agree that computers are everywhere, and we are part right. Computers, it's part of our life. So definitely, I see the upside, the help to the economy, to be able to do more right, being able to kind of get more throughout the day for us as human beings and all in all right for the economy. So definitely I see the upside of leveraging technology: for elderly people, we can replace it with robotics, and flying cars and autonomous driving, and automate everything. I think Thomas gave some great ideas and an example around agriculture, we are kind of flying drones around agriculture to produce better yields for the farmer. So definitely we see the areas where technology can propel, accelerate, and excel the overall either productivity coming from either a vertical or specific field.

But, as we said right, with the good sometimes come some of the bad. And just looking in the last 12 months right of just in a way, replacing human interaction with technology, I think we saw it first hand. Even my two kids right, they didn't go to school for the last year. They just using the same kind of media to interact, but the loneliness, obesity, we see a lot of kind of bad human

behavior that technology. Unfortunately, we can look at technology and almost be the first one to blame .

The second thing that for me some of my past when I did kind of automotive autonomous driving in the industry. In the future, if we truly believe that the technology right will take over, I believe us as human beings, we still have some ethical question right. Technology versus our brain. There's so much of us human being able to try to replicate and build, stimulate the brain using you know neurons and computers and that's where some of the ethical, fundamental ethical problems where I see as a you know coming ahead of us is really an obstacle for us in society.

Olaf J Groth PhD: Yeah so as we drive toward that positive future, we need to mitigate the potential pitfalls to avoid the bad future right. Clearly we need to do more. We see in tech labs right now and in geopolitics, that we're not getting everything right yet right. So we need to protect the positive future from the pitfalls. This has been a fantastic conversation gentlemen, I really appreciate this and I know our audience will as well. Is there anything I should have asked you that I didn't, where you feel like I might have a blind spot or you know the audience needs to hear this, even if I didn't ask it.

Thomas Neubert: I think there's one thing, and I know Olaf this is close to your heart and you bring it up in like casual conversations. And it's really about, if you look at the innovation and how superfast it is happening on a global scale. But you have to also ask about you know what about the global regulations? What about you know ethical considerations for AI applications? What about standardization in certifications for AI systems?

These are really super important topics on a global scale, and it affects all of us on a global level. And I think governments, particularly governments on a global level and on a regional level, they have to step up, they have to come together and they need to act much faster in looking in fear regulations as a whole because everybody thinks they know what like artificial intelligence is or is not. Like the robots are taking over the humans, we all know that's not the case. But we also know that there are different ethical standards around the world. Fine, you have to respect that, but ultimately, this is all affecting all of us, globally, governments and regulations need to act faster to put this all in place.

Olaf J Groth PhD: That makes total sense Thomas right. it's hard to build a new, better future without new, better policies and new diplomacy right and new standards and regulations. So it'll take partnerships between governments and private actors such as Intel to make it happen right, and of course our international counterparts as well.

So on that note, gentlemen, I hope we're going to get it right. Let's meet again in a few years and discuss whether we're on the right path. This was, as always say the start of a good conversation. We will have many more to come. Again, thank you for your time. This has been wonderful and we will be back in touch soon.

Thomas Neubert: Thank you Olaf, appreciate it.

Nick Zilberman: Thank you very much.