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Signature Event

Patrick Gelsinger
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MR. RUBENSTEIN: OK. So, we have the CEO of Intel, Patrick Gelsinger. Let me give a brief introduction to Patrick. He is from the Pennsylvania area. Finished high school there and then went across the country and joined Intel right after graduating from high school. And then got a – while he was working at Intel – got an undergraduate degree from Santa Clara in electrical engineering, then got a master's degree in electrical engineering and computer science from Stanford.

And then stayed at Intel to become the youngest vice president at Intel, and also the first chief technology officer of Intel. And while there, designed one of their most famous microprocessors. And he was there for 30 years, and then was recruited away to become the president and chief operating officer of EMC. Did that for a number of years. And then he became, in 2012, the CEO of VMware, where he tripled the revenues and tripled market value. And then was recruited back to be the CEO of Intel in February of this year.

And Intel, as you probably know, is one of the legendary semiconductor companies; is a company with about 110,000 employees. It has a market capitalization now of about $210 billion and a revenue of about $77-78 billion, something like that.

PATRICK GELSINGER: Close enough. [Laughs.]

MR. RUBENSTEIN: OK. So, we keep reading about semiconductor shortages. Why all of a sudden? Is it because of COVID? Why are we having a hard time getting semiconductors into this country?

MR. GELSINGER: Yeah. What's happened is COVID really was the impetus where all of a sudden, you know, the demand – you know, in the semiconductor industry, about a half a trillion dollars and it was growing about 5 percent per year. COVID drove that to 20-plus percent per year, which on an industry that size, wow, right? But supply chains got disrupted, so supply went negative. And all of a sudden what was probably going to be a little bit of a shortage became a gulf. And now every industry has been disrupted. Auto industries, hey, I can't ship F-150s because of a $2 chip. You know, my – you know, my $10 billion auto – I mean, train project is stopped because of a few chips. You know, all of a sudden, it's become a crisis across every industry. And every one of us – you know, never has semiconductors been as sexy, and cool and important as it is now.

MR. RUBENSTEIN: OK. Well, let's go back for a moment, for people who may not be as technologically savvy as I am. [Laughter.] So, what actually is a semiconductor? And who invented that?

MR. GELSINGER: Yeah, so the idea of semiconductors, right, is this ability to essentially do chips. You know, little transistors turning on and off. And you put them together and it becomes microprocessors and memories that store things. And this idea was actually emanated out of Bell Labs. But Intel was really one of the key companies to push this forward. Fifty years ago, last month we celebrated the microprocessor. And this was the idea that we could actually create a programmable thing that did what we told it to do. And we could start writing software for it. And rather than these big computers like IBM mainframes, all of a

sudden, they were tiny things. And 50 years ago, the microprocessor began, and now they're everywhere. They're in light switches. They're in your Alexas. They're in your – you know, your pocket. And this idea has now –

MR. RUBENSTEIN: Well, who invented – who invented the semiconductor? Is that William Shockley, or?

MR. GELSINGER: William Shockley, AT&T, and the microprocessor was invented by Intel.

MR. RUBENSTEIN: OK. So, William Shockley, for those who don't know, won a Nobel Prize. He ultimately was seen as a racist by many people, had certain eugenics theories that were, let's say, ridiculous. And then he had a number of great scientists and computer people working for him – Robert Noyce, Gordon Moore. And one day they just picked up and said: We're out of here. And they started their new company with something called venture capital, which was novel then.

MR. GELSINGER: Which at the time was a big deal, right? They were the traitorous eight when they left.

MR. RUBENSTEIN: And it was 1968 that they started Intel?

MR. GELSINGER: Yeah, yeah.

MR. RUBENSTEIN: Right. And where'd the name "Intel" come from?

MR. GELSINGER: Integrated electronics. Because the idea at the time was they were – these transistors were discrete things. And Intel, Robert Noyce, invented the idea of an integrated circuit where you could have one piece of silicon with many transistors on it, right? And that was the great Intel innovation. And that became memory chips. That became, eventually, microprocessors.

MR. RUBENSTEIN: OK. So, they built this company called Intel. And they were dominating the semiconductor business and the microprocessor business. So, when did it kind of depart from our shores and go offshore? When did that happen?

MR. GELSINGER: Yeah. And, you know, if we were here in 1990, you know, Intel, the company that puts silicon into Silicon Valley. You know, this was an industry that we created, you know, here on our shores. If we were here in 1990, 37 percent of manufacturing would have been done in the U.S. Even amazingly, 44 percent was done in Europe, right, as well. And today U.S. is 12 percent and Europe is 9 percent. And what we've seen is this has just drifted to Asia, largely for two reasons.

One is the consolidation of supply chains. Clayton Christensen, rebar effect, you know, building more and more integration into the supply chain in Asia for lower costs. And the Asian countries, Taiwan, Korea, China, have aggressively invested in incenting this industry to come to

their shores. And it was never, like, Congress voted let's get rid of the dirty semiconductor industry. It's that the congresses of China, Korea, Taiwan, Japan said: Let's bring this industry to our shores. And essentially, it's 30 to 50 percent cheaper if I were running my manufacturing in those locations than if I was doing it in the U.S.

MR. RUBENSTEIN: So, a chip is made of silicon.

MR. GELSINGER: Silicon and a lot of other elements –

MR. RUBENSTEIN: Where does silicon come from?

MR. GELSINGER: Silicon, sand, right?

MR. RUBENSTEIN: Sand, so –

MR. GELSINGER: The most prevalent material on Earth is the magic, right, of silicon, right? You can add all these different elements of the periodic table. You can get it to do all these magic things. It was like God's gift to the digital age, silicon.

MR. RUBENSTEIN: So, in this iPhone, how many silicon chips are there, probably?

MR. GELSINGER: Oh, 100 or so.

MR. RUBENSTEIN: Hundred? And what about in an average automobile? How many chips?

MR. GELSINGER: You know, the good ones are a few hundred. The not-so-good-designed ones are maybe 1,000.

MR. RUBENSTEIN: OK. And in the electric cars, they have 2,000 or something?

MR. GELSINGER: Yeah, more. And today – you know, a premium car today, about 4 percent of the billing materials of a premium car today is semiconductor chips. And all the shortages are, you know, for that 4 percent. Estimates – and I gave a big speech on this at the Munich auto show a couple of months ago – that by 2030, because of electrification and autonomous vehicles, that number is expected to be 20 percent, right? So essentially your car is becoming a computer with tires, 5X the amount of semiconductor products will be part of that, of the total billing materials, by 2030.

MR. RUBENSTEIN: OK. So, if China were to invade Taiwan, which some people think might happen at some point, would that be bad for the silicon chip world, because so many chips are being made in Taiwan?

MR. GELSINGER: Yeah. That would be very devastating to the world's supply chains. And, you know, clearly, you know, part of our message, part of my message, has been that we

need a more balanced geographically and a more resilient supply chain. And that's just been so emphasized through the COVID shortages.

MR. RUBENSTEIN: Now, the largest semiconductor company in the world now, is that Taiwan Semiconductor?

MR. GELSINGER: No. The largest one is Samsung in Korea. And the second-largest is Intel. And third-largest is TSMC in Taiwan.

MR. RUBENSTEIN: OK. And how did they become so big in Taiwan? Are they really good at making chips, or what –

MR. GELSINGER: You know, they created the new business model, called the foundry. They said, we're not going to design chips. We're just going to manufacture them for everybody else. So, Morris Chang, you know, the leader. You know, he had this – you know, he's sort of like the Fred Smith of FedEx. You know, he had this idea, right, that he drove very aggressively. And, you know, I'll say in Taiwanese history, the most important person, Chiang Kai-shek. The second-most important person, Morris Chang. You know, when he drove this aggressively, he got very strong support, you know, from the Taiwan government. The foundry industry, they perfected that business model. And now, you know, Apple, and NVIDIA, and, you know, many other companies who don't manufacture their chips, they use TSMC to be their manufacturing partner.

MR. RUBENSTEIN: Well, let's talk about that. Intel manufactures chips and you design them.

MR. GELSINGER: Yes.

MR. RUBENSTEIN: Some companies only design them.

MR. GELSINGER: Yep.

MR. RUBENSTEIN: For the biggest company market cap in the chip world in the United States is NVIDIA, right? With, like, a $700 billion market cap. They only design chips, is that right?

MR. GELSINGER: Yes.

MR. RUBENSTEIN: Why don't you just design chips? It's a better business, isn't it?

MR. GELSINGER: Well, you know, we believe that this idea of being an integrated design and manufacturer can be, and again, will be a superior business model if we execute it well. The world needs multiple foundries. And we're committed to now – you know, Intel before only designed and manufactured our chips. You know, I've changed that strategy, somewhat like Microsoft. When they said, you know, only our software runs? No, we're going to open up and we're going to run everything. And I've taken a very similar strategy to open up

Intel, our fabs, our designs. We're going to open up to the industry. And I'm going to become an American foundry for the rest of the world's chips, as well as continuing to design our own chips.

MR. RUBENSTEIN: But to build chips here costs more than building them in China or Taiwan. So, aren't you going to have more expensive chips that people won't buy then?

MR. GELSINGER: That's exactly why we've been working with the U.S. government to create what's called the CHIPS Act. And the CHIPS Act essentially levels the playing field with Taiwan and Korea, right? It creates an incentive structure that we believe, you know, puts it about on par with what Taiwan and Korea do today. And that passed the Senate back in June. It's now in the House. And, you know, I've been meeting with a lot of the House members and so on this week to help get that across the line, because we believe that will be a meaningful incentive.

And if you think about this, if the economic structure is fairly even, you know, a new fab for me is about $10 billion. The project that we just started in Arizona, $20 billion. You know, if it's 40 percent cheaper to do that in Taiwan, that's $8 billion. I mean, these are big boy dollars, right, that we're talking about. And, you know, if the CHIPS Act helps to bring that back in par, you know, the U.S. has proven that our innovation might, you know, clearly wins. But that's too big of a gap. That's why we've gone from 37 percent to 12 percent. That's why this industry has drifted there.

MR. RUBENSTEIN: And the members of the House say they're going to pass this at some point?

MR. GELSINGER: Yeah. Their message this week is, you know, we're a little bit of the normal, you know, Washington legislative sausage making. But it's not an if but a when it gets passed.

MR. RUBENSTEIN: So, when members of Congress tell you something you believe it, right?

MR. GELSINGER: Oh, absolutely. [Laughter.] Have they ever lied?

MR. RUBENSTEIN: Not that I know of.

MR. GELSINGER: OK. Then I will trust them.

MR. RUBENSTEIN: OK. So, it's called the CHIPS Act. CHIPS is an acronym for something. How long did it take for somebody to come up with words that would – [laughter] – make into CHIPS? I don't know –

MR. GELSINGER: I'm sure there's some creative staffer that spent days on that.

MR. RUBENSTEIN: Somebody came up with that? OK. So, it's the CHIPS Act. And then when the CHIPS Act passes, like a $50 billion –

MR. GELSINGER: $52 billion.

MR. RUBENSTEIN: $52 billion. So, if you build a facility you go before somebody or another and you say, give me some money?

MR. GELSINGER: Commerce, yeah.

MR. RUBENSTEIN: OK. And so, I now read that Samsung is building a chip facility in Texas. And I think – is the Taiwan Semiconductor's building one in –

MR. GELSINGER: TSMC is building one in Arizona.

MR. RUBENSTEIN: In Arizona. So why would they be building them in the United States when it's cheaper to build them in their own countries?

MR. GELSINGER: Yeah. Well, their customers are now saying, hmm, this situation is – you know, geographically – you know, our customers are looking for us to balance our supply chains around the world. You know, we are too concentrated. You know, in Taiwan, major drought issues this past year, right? They're running into talent limitations. They're running out of electricity. You know, so they have their own geographic limitations. And their customers are saying: Huh, I want a more balanced supply chain around the world. And the CHIPS Act is, you know, going to be available to them as well. Which we certainly support. We believe it needs to be more beneficial to American companies but, you know, we believe that, hey, a next TSMC or Samsung factory in the U.S. is better than the next one being built in Asia. I fully agree.

MR. RUBENSTEIN: You were quoted in the press, maybe misquoted – I know the press sometimes gets things wrong – but –

MR. GELSINGER: That's the only time it's ever happened.

MR. RUBENSTEIN: But it said that you didn't think that the Taiwanese companies or the Korean companies should get participation in the CHIPS Act if they build something here. Is that correct or not?

MR. GELSINGER: I believe they should get supported by the CHIPS Act. I believe American companies with American IP should get more support from the CHIPS Act. But absolutely, we believe the next Asian company building a factory here is better than them building the next one in Asia. You know, and similarly in Europe. You know, we firmly believe there should be a more geographically – [off mic] – supply chain that becomes more resilient. Semiconductors are so important to every aspect of humanity and becoming more important. You know, God decided where the oil reserves are. Let's put the fabs where we want them,

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because the fabs are more important to the next couple of decades than where the oil reserves are. Let's put them where we want them.

MR. RUBENSTEIN: But you still think American companies should get some benefit over what –

MR. GELSINGER: Absolutely.

MR. RUBENSTEIN: All right. So how would you get a benefit? If they're going to get support from the CHIPS Act, the Taiwanese companies, how would the American companies get some benefit?

MR. GELSINGER: You know, if they get a dollar, I should get more than a dollar.

MR. RUBENSTEIN: So, in other words, if they get a billion dollars to build a facility, you should get $2 billion, or something?

MR. GELSINGER: Something like that. You know, there clearly should be advantage. And you know, I think that's politically correct. You know, if I was going to Taiwan, I don't expect to get treated as good as TSMC does, right? You know, I believe, you know, that's part of national policy. Industrial policy should clearly be saying: What do we want? Do we want manufacturing in the U.S.? Absolutely. Do we want the intellectual property, R&D, and manufacturing in the U.S.? Even more so.

MR. RUBENSTEIN: What about Europe? Are they in the game anymore?

MR. GELSINGER: You know, we spent a lot of time in Europe over the last six months as well. And they have, and they're proposing, the equivalent of the CHIPS Act in Europe. And Ursula von der Leyen, president of the EU, you know, Margrethe Vestager, Thierry Breton, you know, two of the most important commissioners on technology issues. They are aggressively creating their CHIPS Act as we speak. And we've been engaging with them, because we would hope to expand our footprint not just in the U.S., but Europe as well.

MR. RUBENSTEIN: In Asia they don't need a CHIPS Act, because they've had one for a long time.

MR. GELSINGER: Yeah, they did theirs two and a half decades ago.

MR. RUBENSTEIN: OK. All right. I see. Now, for those who aren't, again, as technologically savvy as I am, how do you actually design a semiconductor or a chip? I mean, how hard is that? Does it take an hour to do it, or how long does it take?

MR. GELSINGER: [Laughs.] You know, a major new microprocessor, you know, one of our high-end chips, is about a four-year project.

MR. RUBENSTEIN: Four years?

MR. GELSINGER: Four years, right, to do it. And, you know, the architecture, right, it's all done in software on the computers now. You know, the physical layout of it, the different components. You have to send it into manufacturing, get prototype tips. But that whole thing, from, you know, the first idea until volume production, is about four years.

MR. RUBENSTEIN: All right. So, in, let's say, the sports world somebody can be a great basketball player, or football player, or baseball player. Or in the art world you can be a great painter, a great dancer, great singer. Can you be a great chip designer by yourself? Can somebody go into a room and say, stay away, I'm going to design a chip, you're not going to be involved? Or is it a team effort?

MR. GELSINGER: It's a team. Now, typically – and, like, I was the architect of the 80486. I was number one person on that. You know, I laid out the initial concepts, and so on. But then the team became about 150 people to design that chip. You know, today these chips are much more complicated than that, much more sophisticated. You know, my 486, you know, my Mona Lisa was 1.2 million chips. Today, our most high-end chip is 100 billion transistors. And we project that we'll be doing a trillion transistor chip by the end of the decade. But today's design teams are maybe 5- or 600 people large.

MR. RUBENSTEIN: So, if somebody says, I want to be a chip designer, should they major in philosophy, or history? Or what should they – what should they – what kind of people are you looking for?

MR. GELSINGER: STEM.

MR. RUBENSTEIN: STEM, that's it?

MR. GELSINGER: STEM, STEM, STEM. Science, you know, technology, engineering, mathematics. But also, arts, right? You know, and I'm very much a STEAM person not a STEM person, right? Where, you know, it's very much about industrial design as well, and, you know, bringing those skills together. But it's much more the hard sciences.

MR. RUBENSTEIN: So, if you design a chip and it's on paper, you're designing it and looks great, but then you actually make it and it doesn't work. Does that ever happen?

MR. GELSINGER: It always happens. There's always some amount of debugging, testing, and manufacturing. You know, very rare does a major new design go into production on what we call the A step. But, you know, given all of the sophisticated simulation and emulation technology, some of which is done by Siemens as well, you know, that whole process, you're getting very close, right? The first ones coming out are functional. And then you do a few tweaks, and then it goes into production, usually on a B or C step.

MR. RUBENSTEIN: So, we hear a lot now about the future being quantum computing. What is quantum computing? And will we live to see it in our lifetime?

MR. GELSINGER: Yeah. So, the idea of quantum computing is, you know, the transistor is a binary switch. It's on or off. It's one or a zero. It's called digital logic. Well, quantum logic basically is a different effect. Rather than have an on or off transistor, it's the quantum effect. And there are certain problems that can be expressed in quantum terms far more effectively than in digital terms. And if we can get a quantum computer to work, those classes of problems will be much more powerfully solved on a quantum computer than on a digital computer.

Now, the one that gets everybody excited is security problems, algorithms. Encryption is the one where quantum could, if we get them to be functional, stable, predictable at that level, you know quantum effects probably will allow us to solve encryption problems at, you know, dramatically faster, using quantum effects. There's also things like medical biological things that are more probabilistic that are probably going to be much more effectively solved using a quantum computer.

Today the idea of a qubit versus a transistor, you know, we're showing small qubit quantum computers today. We could – you know, come to my lab, I'll show you a qubit in action, right, a real quantum effect. And, you know, my expectation is about 2030 is when we'll see quantum supremacy. What does that mean? That means that we'll have a stable, predictable quantum computer that is reliably producing better results than a digital computer would, right, at scale. And that'll be the first moment that we're going to say quantum is here. But quantum ain't going to be anything that you're using regularly. It's going to be this special cloud datacenters that you have, because it only needs to operate close to absolute zero.

MR. RUBENSTEIN: I have this image in my mind –

MR. GELSINGER: So, we just need to put your big, honking refrigerator in your pocket for you to carry it around. And these refrigerators, you know, are about 25-feet large, right, with all these things, to create one little qubit as well. It's pretty cool stuff.

MR. RUBENSTEIN: So, the image I have in my mind is you have a bunch of chip designers sitting there. They're all Stanford or the equivalent educated. They're engineers and so forth. And they're virtually all men. Is that wrong?

MR. GELSINGER: You know, at this point, you know, there's been a lot of emphasis in the industry to improve the diversity. And, you know, I've been on this for almost 30 years, that we need to improve the female population. You know, they're half of humanity. Why don't we have half of them being engineers, and get the creative? Today the industry's about 26-28 percent females. We have set our 2030 goal to be 40 percent, you know, from where we are. Intel's now about 30 percent. So, we're driving hard to improve the pipeline of females. Also, there's under representation in the, you know, African Americans, et cetera. So, it's been way too white male dominated. We have to drive diversity in this industry significantly.

MR. RUBENSTEIN: To get a job at Intel if you're just graduating from a very good school, what do you have to do? You have to be an engineer? You have to be personable? Don't wear a tie? Whatever you have – what is it you have to do?

MR. GELSINGER: You have to be a good geek.

MR. RUBENSTEIN: Really? OK, so you have to really look weird and –

MR. GELSINGER: You don't have to look weird. But you got to be a geek. And, you know, the people that we're really looking for would be top engineering talent. Bachelor's, master's, you know, Ph.D., people who've really excelled in the STEAM/STEM categories. Now, of course, we're a big company. So, we hire finance people. We have a few marketing people. We have salespeople. You know, and the other thing is we do manufacturing. You know, we have about 40,000 people doing manufacturing. And some of that's engineering, but a lot of that is technicians. You have operators on the manufacturing line. We train many of those. You know, this is just a tremendously good, clean industry in that regard, where entry-level technicians like me, you know, starting as a farm boy technician, right, and now becoming the CEO of one of the iconic companies of our age, wow. How did that happen?

MR. RUBENSTEIN: Well, let's talk about your farm boy background. You grew up, where?

MR. GELSINGER: Pennsylvania, outside of –

MR. RUBENSTEIN: In a farm, or really?

MR. GELSINGER: Yeah, it was a farm community between Reading and Hershey. If you went halfway, it was Robesonia. We lived five miles outside of Robesonia. So, I said, when you go to nowhere, we were five more miles right. All of my uncles are farmers. I was just back there seeing a number of them. We had, you know, steers. We had horses. We had chickens. We had pigs. We had, you know, corn, wheat, soy –

MR. RUBENSTEIN: Is that what – were your parents farmers? Or what were they?

MR. GELSINGER: Yeah, my dad was number nine. Part of my reason I'm here is he was number nine of 10. And grandpa helped one through eight buy their own farms. My dad never had his own farm. So, he worked with his siblings. So, he never had his own farm. Had he had his farm, I would be a farmer today. Oldest son, I would go into farming.

MR. RUBENSTEIN: So, he worked on a farm, but you didn't live on a farm.

MR. GELSINGER: That's right. That's right.

MR. RUBENSTEIN: OK.

MR. GELSINGER: So, we lived amongst all of our uncles' farms and, you know, worked there.

MR. RUBENSTEIN: So, explain how you sort of graduated, but not completely graduated from high school. It's an unusual story. Can you explain that?

MR. GELSINGER: Yeah. I accidentally took a scholarship exam. Ended up winning a scholarship. Wasn't supposed to take it until my senior year. Took it in my junior year. So, I ended up skipping my last year and a half of high school, getting my associate's degree. And then Intel came recruiting for technicians. So literally I graduated in June with my high school degree, in August with my two-year, my associate's degree. Intel came recruiting.

The guy, Ron Smith was his name. You know, I was number 12 of people that he interviewed that day. And if you've ever done any interviewing like that, about number 10 you can't remember male from female. And I was number 12, right? And he wrote on his paper after interviewing me, he said: Smart, aggressive, arrogant. He'll fit right in. [Laughter.] So, I got invited to interview in California, right?

You know, I had never been on an airplane, right? A free trip to the beaches of California? Sign me up, baby, right? So, I took a free trip to California. But I promised my mom, I'm never moving to California. They're crazy out there. They got cults, and earthquakes and stuff. Never possible. The next thing I know, I'm sucked into Intel as an 18-year-old technician. And they paid for my bachelor's, master's, and Ph.D.

MR. RUBENSTEIN: How did you – how did you get a master's degree at Stanford while you were working? Isn't that a little tricky?

MR. GELSINGER: It's pretty crazy. And, you know, they had a tuition reimbursement program where as long as I worked 30 hours they'd pay for my full tuition. You know, I'm a broke, cheap, poor farm boy. They paid for tuition. And so, I was working at night and going to school during the day. Did that for my bachelor's, did that for my master's. And then, you know, another fun little story, I quit Intel working on my Ph.D. program to, you know, go full-time to finish my Ph.D. You know, instead of working full time and going to school full time. And Andy Grove comes to me. And he says: Instead of going there and learning on the simulator, why don't you stay here and fly the jet? And he made me the 46th design manager when I was 24 years old.

MR. RUBENSTEIN: He was the CEO.

MR. GELSINGER: You know, the famous Andy Grove of Silicon Valley. And he made me, you know, the 46th design manager at 24 years old. Now, the amazing thing is, there was nobody on the team younger than me. I'm the youngest person the team. And I'm in charge of the most important chip in the industry of the age.

MR. RUBENSTEIN: So, when you met Andy Grove, you were working for him and then Robert Noyce, Gordon Moore, did you say, they're not as smart as their reputation? Or I'm smarter than them? Or what did you think?

MR. GELSINGER: Oh, they were stunning. Yeah, they were just – you know, Andy, intellectual integrity, strategic capacity. You know, seeing him and Bill Gates argue was like a masterpiece, right? You know, these two intellectual giants going head-to-head. You know, Robert Noyce, you know, Nobel Prize winner, integrated circuit. You know, just stunning, you know, creative capacity. Gordon Moore, you know, Moore's Law. I just interviewed Gordon, you know, 92 years old living in Hawaii. You know, I mean, you know, stunning individuals. And I –

MR. RUBENSTEIN: What is Moore's – for those who don't know, Moore's Law is?

MR. GELSINGER: Moore's Law, he predicted the semiconductor industry future, saying that the number of transistors would double every two years, right? And if you do that over a couple of decades, that gets to be a really big number. One-point-two million to 100 billion, right?

MR. RUBENSTEIN: So, what's Gelsinger's Law? Do you have a law?

MR. GELSINGER: Gelsinger's Law is we're going to keep doing Moore's Law. [Laughter.]

MR. RUBENSTEIN: OK. All right. I got it. All right. So, let's talk more about your background. So, you work your way up, you become the youngest vice president, chief technology officer. So, and then you're there for how many years, 30?

MR. GELSINGER: Thirty.

MR. RUBENSTEIN: Thirty years. And then you get recruited away. So, was it hard to leave Intel?

MR. GELSINGER: Dreadfully hard. You know, and I thought – you know, I had written in my personal mission statement when I was in my mid-20s that I was going to become president and CEO of Intel. And, you know, it was a crazy thing to say. You know, I was this 20-year-old punk, right? You know, but to me it was sort of, like, you know, I'm going to work to make myself good enough that I could sit in the chair of Andy or Gordon. And so, every time they would say something I'd say, hmm, would I have said that? Could I have said that? You know, it just became this constant sea of do I know enough, have I learned enough, am I good enough? You know, do I, you know, for that journey?

So, leaving Intel, you know, I mean, it was multiple years until I got over it. I still did the Intel "bung, ba-dun-dun-dun," every night, right? You know, it was, like – you know, so very hard. But also, you know, when you're at a place for 30 years there is no other, right? You don't know right from wrong. There's only that approach. And so, leaving Intel was an extraordinary experience to learn a new culture. You know, a sales-oriented culture versus an engineering and manufacturing one. You know, learning the software industry, becoming a CEO.

So now it really is 11 years of, you know, coming back to be the CEO. By the way 11 years is an interesting number to be away from a company. It's the same amount of time Jobs was away from Apple, right? Almost to the day, right, you know, from my time away from Intel.

MR. RUBENSTEIN: So, but one of the things you did while you were away is you ran a company that, I remember, had gone public and got a lot of attention, VMware, when it went public. Later bought by EMC. But what does VMware do? And what did you do that dramatically increased its value?

MR. GELSINGER: Yeah. VMware invented this idea of a hypervisor. Another technical term. But it basically makes one hardware computer look like many software computers to applications. So, all of a sudden one server can look like 10 servers. You know, when you walk into a datacenter, I'll take 10 servers and make them one. Wow, what a value proposition. They perfected that piece of software. And then they parlayed it into a software enterprise business. And when I came in, you know, essentially it was a one-product company. I made it a one-platform company – you know, for networking, for storage, for management and automation. And we tripled the size of the company, more than tripled the market cap. And I made my friend Michael Dell a lot of money.

MR. RUBENSTEIN: Michael Dell was the owner of EMC, and in fact he did a leveraged buyout of EMC, which VMware was part of. And you made him, let's say, $20 billion or so. Does he ever say thank you?

MR. GELSINGER: He's a very thankful guy.

MR. RUBENSTEIN: He is? OK. [Laughter.] So, all right. So, you're running VMware, and then all of a sudden somebody calls you and says: OK, now it's ready. You can come back and be CEO. Did you say, I don't want you anymore, I'm very happy at VMware?

MR. GELSINGER: Well, it was a little bit different than that, because on Thanksgiving, just a year ago, I got a call, would you join the board of Intel? Hmm. Yeah, so I go to Michael Dell and I said: Michael, what do you think about me joining the board of Intel? And Michael says, hmm, they need help. Go help them. So, I started interviewing for the board. So, I interviewed for the month of December last year to join the board of Intel. I'm learning it, thinking about the strategy. You know, I've been away from it for 11 years, and so on. You know, get my own strategic thoughts put together.

And then December 23rd, you know, when activists are starting to chew around the edges of Intel and, you know, make some noise. And they said, would you consider being the CEO. Ruined my Christmas holidays, right? [Laughter.] You know, Linda and I. Because it was one of these because it was one of these where, you know, we'd just had our eighth grandchild. You know, life is good. The company's good. We're about to take – you know, and spin VMware out of Dell. I wasn't quite finished, and so on.

But the idea of going back to the company that I had written, you know, almost 30 years ago to be the CEO of, it's sort of like, wow. But doing that in the middle of a pandemic, in the middle of a global shortage, to turn around an icon, wow, right? And three weeks of chaos from my wife and I. And we agreed – because I view these things as, hey, if I'm making the decision, we're making the decision. And we made the decision to come back to be the CEO.

MR. RUBENSTEIN: Now, you're a very hardworking guy, obviously. Obviously very smart. But you've written a book about the importance of work/life balance. So, what is the work/life balance in your work life?

MR. GELSINGER: Yeah. Right now, there's not a lot. But, you know, and you know the whole idea of work/life balance, I say, right, you know, I'm man of faith, right? God, family work, you know, that's the life priorities. And if you ever get it to be work, family, God, you know, life ain't going to be good for a long time, right? It may be good in the short time, but you have to live by those priorities. You have to set disciplined boundaries. You have to live like your priorities are your priorities. You know, and your kids and your spouse and, you know, those relationships.

And, you know, we did crazy things like, you know, we talk about in the book, about having an at-home chart, keeping score, right? And, you know, my secretary would produce the independent audited version of my at-home score, right, and give it to my wife each month. And so on, you know, all of these things that just keep you on track and keep in balance for your life. But, you know, it was always this, you know, struggle. And any successful person is always fighting these, you know, tensions of the different aspects of living.

MR. RUBENSTEIN: Now, let me ask you, when I try to – I'm not that tech savvy, obviously. But my computer, when it doesn't kind of work the way it's supposed to, I, you know, scream at it or something, or pound on it or something, or then call my tech people to ask how to do it. What do you do? Do you ever have a problem getting your computer to work? And do you scream at it? Or do you just – you can fix it yourself?

MR. GELSINGER: Well, generally I am the technician to fix my computer, my wife's computer, my kids' computer, my grandkids' computer.

MR. RUBENSTEIN: So, you fix – you can fix it?

MR. GELSINGER: Mostly. But now I'm so busy I call the tech people too. [Laughter.]

MR. RUBENSTEIN: OK. One time I actually – I couldn't work this iPhone. I was there, and I was at a conference in China. And Tim Cook was there. I said, I can't work this thing. He says, David, I usually don't do tech support for other people, but I'll do it for you. So, he fixed my iPhone, so that was pretty nice of him. [Laughter.]

MR. GELSINGER: Yeah. I'll help you too as well, David. [Laughs.]

MR. RUBENSTEIN: OK. So, most CEOs by the time they get to be CEO, they're fairly sanitized in terms of talking about their religious faith. And so, you rarely can get a CEO really talking about their religious faith. They kind of avoid it. You're the opposite. You talk about it a great deal. You're very involved in Christianity, and very involved in it. And you would say that it's the most important thing in your life, other than your family, I guess you would say. So, can you explain why it's so important to you, and how it has helped you be a successful businessperson?

MR. GELSINGER: Yeah. First, a little story. So, I joined Intel, walking around the hall, starting to go to school, became a Christian at 18 years old, you know, after I moved to California and really made that, you know, firm religious view and spiritual decision. And then a few months later I felt like God was calling me to become a full-time minister. And I started to argue with God. You know, I don't want to be a minister. I want to design computers. I love this stuff, and I'm good at it, right?

And, you know, finally there's a story in the Bible, Gideon, right, you know, where he lays a fleece before God. If this happens, you know, I'll do this. And so, I laid a fleece before God. And the answer that came very clear to me was the workplace is your ministry. Right, and I'm here to be – you know, some became vocational ministers. I am here to be a full-time workplace minister. And, you know, my CEO, right, you know, God and Jesus Christ. And I am going to do everything that I do in the workplace to honor that calling.

Now, when you go into the workplace though, particularly now as the CEO, you know, I need to be entirely diverse and inclusive. But I am now so aggressively diverse and inclusive – diversity is easy, right? You just count the noses. One female, a Latino, a Black, you know, so on. OK, boom. Inclusion means do you feel like you are all in when you're at the table, right? And now I go to the table and I say, I'm a Christian. Let me tell you about it, because I am bringing my whole self to the workplace, and I want you to bring your whole self too.

Oh, you're a Sikh, tell me about that. Oh, you're Indian? Well, what's this crazy Diwali thing, anyway? I want to know all about that. You know, and you just start to become aggressively intentionally diverse. And if you're reserved and saying, oh, I'm not going to talk about anything that's really important to me. You know, I can talk about the Washington team, and why did you change it from the Redskins anyway, right? Or I can talk about my grandkids. But I can't talk about the most important thing to me? That's not inclusive, right?

And in this I'll say, I have become aggressively diverse and inclusive. And as people understand that, and, you know, I'll say aggressively and intentional about respecting other people's faith. You know, what's most important to them. It is game-changing for how you think about that in the workplace. That's what's most important to me. I'm proud of it. And I want to know what's most important to you as well, in addition to getting this next chip done and getting the CHIPS Act approved, and getting it done. And it becomes an outpouring of our philanthropic efforts as well.

MR. RUBENSTEIN: So, one of your sons came to you and said he wanted to be a pastor. You didn't say, go into private equity, hedge funds, anything like that. You said it's OK, even though he's not going to make any money, right?

MR. GELSINGER: Yeah. And what I said to him when he laid that out – and he was really looking – and, you know, parents, you have the opportunity to bless your children, you know, to honor them as they are moving into their professional career. And what I said to him, I said: The only currency that matters when we get to heaven is how many lives you have influenced for eternity. And I said, you will influence more lives for eternity than I did. Not only am I proud of you, son, but I couldn't imagine you picking a better career profession than becoming a minister.

MR. RUBENSTEIN: So other than religion, outside of your work, you have some philanthropic interests. What are your main philanthropic interests?

MR. GELSINGER: Yeah. We could go on for quite a while. One of them is we began supporting work in the poverty-stricken areas of Kenya, in particular 200 kids in schools that we supported. Today we're crossing 30,000 kids now in 25 schools in the slums of Kenya. And we've set a goal to hit 100,000 kids by the end of the decade that are in our schools there. And these are – you know, one of the kids now just graduated from Stanford with his bachelor's degree, coming from, you know, less than 60 cents a week, right, in the slums of Kenya, is now graduating from one of the most prestigious institutions in the world. [Applause.]

MR. RUBENSTEIN: So, the man who built Taiwan Semiconductor is Morris Chang, you mentioned. He's now 90 years old. And he said recently that you were too old to – [laughter] –

MR. GELSINGER: Right, good.

MR. RUBENSTEIN: He said you were too old –

MR. GELSINGER: We're ready.

MR. RUBENSTEIN: – to lead Intel. You are 60 years old. So, what did you say when you read that?

MR. GELSINGER: Well, you know, first thing is, bring it on, baby. But the second thing is, you know, there was a policy in place that Intel had of required retirement at 65. And when I – you know, one of our first board meetings, I came to the board of directors. The first thing, I don't want talent, you know, to be pushed out of the company at 65. I have key people that, you know, are doing great. I want to keep here. You know, secondly, I think it's an outdated rule that might have been appropriate a decade or two ago, but not anymore. And third, you don't want to take your new CEO and require him to already be planning his retirement, right? And so, we changed it. So, it's fixed.

MR. RUBENSTEIN: So, you can stay as long as you want.

MR. GELSINGER: I can stay as long as I want, at the board's blessing and my wife's support. We're in.

MR. RUBENSTEIN: OK. So, the turnaround at Intel that you're trying to bring about, is that a two-year, five-year, 10-year kind of thing?

MR. GELSINGER: Yeah. When we took the job Linda and I said, you know, this is a five-year assignment to get it done. We think it's a couple of years to, you know, rebuild, to get the strategy back, the execution back in place, to get it underway. We think it will be some amount of time to get the businesses back to unquestioned leadership. Some of the new businesses, like the foundry business that we started. It's a five-year assignment to get all of that well and healthy again. But we didn't set a timeline on it. Will it be done in four? Maybe. Less than that? No way. You know, could it be six, seven, eight years that I'm CEO? Maybe, you know, if we're having fun and I'm healthy and good. But it's a five-year job.

MR. RUBENSTEIN: So, your last quarterly report you reported that you're earning – your revenues were up about 5 percent or so, but your stock went down. Is that frustrating when you do that?

MR. GELSINGER: You know, what we did the last quarter is, you know, we laid out to the street very clearly what it takes. You know, and we're going to lower our margins, increase our CAPEX significantly, to build a manufacturing technology powerhouse. And on a quarterly basis, that's going to suck. And the financial markets rewarded us for that with about a 10 percent reduction of our stock price. And I was a very happy guy because my financial expectations are now meet/beat/raised for as long as I can see into the future, and they are consistent with the investment and business strategy that I've laid out. So, if you want to measure me on a quarterly basis, I fail. If you want to measure me on a two, three, four-year basis of turning around an industry and an iconic company, that's what I want to be measured against.

MR. RUBENSTEIN: OK. So, in 2017, before you joined – rejoined Intel, they bought a company called Mobileye, an Israeli company, for about $15 billion. It's now been reported in the press that you're going to take it public at a valuation of $50 billion. So, what can you say about that?

MR. GELSINGER: Well, you know, Mobileye is a killer company. I mean, the team there. You know, and we would say there's only two companies in the world who can do leading-edge autonomous technology. Tesla, Mobileye. And so, this is a wonderful asset. You know, we think that the autonomous vehicle – and Mobileye they – you know, any of you have collision detection on your car? That is probably Mobileye, right? That's the technology inside of that.

And the moving from ADAS, as it's called, collision detection and avoidance, to autonomous vehicles. And they're you know, now demonstrating that in multiple geographies, multiple car manufacturers. So, we see it as an explosive time for the Mobileye technology.

And really, you know, while we're not a car manufacturer, we are the technology company – just like Intel does – that will make this available for all of the car manufacturers, and really drive this into the industry. So very exciting time for it.

But being part of Intel, and this is somewhat what EMC did with VMware. It's a very similar play. We said, the market is not going to give us a multiple associated with a hot high-growth category. So, we're going to create – you know, we're going to spin a portion of it available. We'll do an IPO. We'll maintain the majority of it, to keep driving the synergies, but we're going to create a separate tradable entity around Mobileye.

MR. RUBENSTEIN: Have you ever been in one of these autonomous driving cars?

MR. GELSINGER: About 10 times.

MR. RUBENSTEIN: And you think they're going to be around –

MR. GELSINGER: Oh, it is so cool.

MR. RUBENSTEIN: But do they really work?

MR. GELSINGER: Absolutely.

MR. RUBENSTEIN: Do you wear a helmet when you're in those? [Laughter.]

MR. GELSINGER: Absolutely not.

MR. RUBENSTEIN: Oh.

MR. GELSINGER: Right, as well. And I'll tell you, you know, to me it goes from mind-blowing to mundane. Because you get in one of these things and then it's, like, you're not – you took your hands off the steering wheel and hit a button? It's, like, yeah, it's going to take us. And the first minute you're just, like, right? And then all of a sudden, the car, it's adjusting lanes, it's slowing up, speeding down, detecting the light change, and so on. And all of sudden it's, like, you know, how are the kids doing, right? You know what I mean? It just becomes mundane. Of course, the car's going to take – I mean, and, you know, we've now created the statistical and technical basis that the car is at least an order of magnitude better than the human drivers on that road.

And we're able to statistically and regularly prove that to be the case. It is, you know, fabulous at that level. It's learning the behaviors of those roads, right? It's learning from the other cars around it. It doesn't get distracted by texting. You know, it doesn't lose sight of how many drinks you've had the night – it does the right thing on a[n] order of magnitude better basis. And we're doing this in high volatile areas. I've driven them in Tel Aviv. You know, have you ever driven in Tel Aviv? You know, nobody there drives by the rules, right? You know, it's a crazy environment. In Munich, Paris. You know, I mean, it is really a fabulous experience.

MR. RUBENSTEIN: Yesterday you announced an acquisition of another company in Israel. You've made six acquisitions there in the last five years or so. So, what is it about Israel that attracts Intel?

MR. GELSINGER: You know, a number of years ago – and this is very early in the days of Intel – there was a famous engineer for Intel who invented what was the precursor to the flash memory. It was called the EPROM. And he says: I'm moving back to Israel, Andy, and I'd like to start Intel-Israel. And Andy said, no blanking way, right? You know, and he left. And then he kept coming back. About every three months he came back to Andy and he said, I'd still like to start Intel-Israel. And after about nine months, you know, of getting harassed by him, he finally said: OK, we'll give it a try.

Intel was the first multinational technology company to start in Israel. And so, the love affair between Intel and Israel, you know, is now almost 50 years long that this has been underway. And they are extraordinarily innovative, hardworking. You know, and I love it. You know, one time during the Intifada one of the teams there – I was on the phone call with them. And, you know, I was saying, well, maybe we should – you know, given some of the, you know, noise that's going on and the concerns in the market, maybe we should move this project somewhere else.

And I remember Avi Kalani [ph], the guy who was running the manufacturing, he says: We have fought four wars since we've been part of Intel and we've never missed a commitment. [Laughs.] Right? It's just that dogged determination that the people have, the confidence, the innovative. You know, and it's one degree of separation. Everybody knows each other, and they are going to make themselves successful. It's just been a tremendous environment. And today people have written books around the startup nation. You know, so we love it. You know, we've had great success there. We're the largest employer in the country. So, you know, we really are, you know, quite fond of that relationship.

MR. RUBENSTEIN: But you're a committed Christian and Jesus was born there, so that doesn't –

MR. GELSINGER: That doesn't hurt either. I don't mind going to the Holy Land.

MR. RUBENSTEIN: OK. So, let me ask you today, is it true that, as I've read, that the computing power on the missions to the moon in the '60s were less than the computing power you have in your iPhone?

MR. GELSINGER: Yeah, it's about 100X greater what you carry in your pocket today than what took you to the moon and back.

MR. RUBENSTEIN: Wow. OK, so what are – five years from today, what technology device am I going to have that's going to mesmerize me and make my life better?

MR. GELSINGER: Yeah. You know, we think – you know, I've called it the four superpowers, that you have ubiquitous compute. You know, compute will be in everything, right, as you see into the future. That you'll have infrastructure that's scalable and, you know, distributed. Right, so that you'll always have low latency, high bandwidth. So, cloud and edge infrastructure. Everything will be get connected. Everybody and everything will get connected. And AI will be pervasive in everything. You know, and these are the four superpowers that are going to drive every innovation.

So, you know, you're going to walk up to your door, right, and it will recognize you, right? Let's say, a fun little scenario here. You know, tomorrow morning, right – what time do you normally get up, David?

MR. RUBENSTEIN: 5:30

MR. GELSINGER: OK. 5:30. Tomorrow morning your smart device wakes you up and says: David, time to wake up, right? You look and it's 4:30. And your smart device will say, last night you had a heart irregularity. That's the third heart irregularity that you've had over the last 30 days. You know, that has now become a risk factor. So, during the night I upped all of biometrics to the cloud, I've compared it to everybody in your DNA type, right, last night. We've run the full synthesis, right, of that. We've already, you know, prearranged for, right, your doctor's appointment today.

All of the results will be there by the time you get to your doctor's appointment. We've loaded the directions to the doctor's appointment into the Mobileye driven autonomous vehicle. You know, I needed to get you up early because we're predicting a little bit of traffic on the way there today. So that's why I woke you up early. Sorry about that. You know, I've moved your Starbucks order to the Starbucks on the way. And since we are going to the heart doctor, we made it decaf. [Laughter.]

MR. RUBENSTEIN: Geez, I don't know if I want this heart doctor part of it, but OK. [Laughter.] So that's what's going to happen?

MR. GELSINGER: Yeah. I mean, these things – and, again, you think about that. You know, autonomous vehicles, will they be there? Absolutely. Will personalized medicine be there? Absolutely. Will, you know, DNA-driven, you know, N of one medicines be possible? Yes, absolutely. Will you have, you know, right, voice driven activation of technology. All of these things are going to come together over the next decade, drive by those four superpowers.

MR. RUBENSTEIN: You know, you're obviously talented. You know your business. You're well-known. Have you ever thought, if you went out and raised your own private equity fund in the technology area and got 20 or 30 percent of the profits, you might make more money?

MR. GELSINGER: You know, I'm a company guy. I like working and scaling with people. And you know, some people are driven to be entrepreneurs. You know, I've always, you know, enjoyed, you know, big teams, big companies, big resources to effect global – you

know, the Intel mission statement, you know, that we're – you know, we will improve the lives of every person on the planet, right? How many companies can say that? You know, I helped to – you know, not only did I help microprocessor, I helped to create USB. I helped to create Wi-Fi. I helped to create many of the standards. You know, I wrote the first net neutrality bill. You know, I mean, these things. A scale company like Intel allows you to truly touch the lives of every human on the planet. You know, and I'm not interested in financial gain. I'd just give it away, right?

MR. RUBENSTEIN: So, if the president of the United States called you, some president, and said come in and be secretary of something and work on technology, you would say?

MR. GELSINGER: I'd have to get a divorce first. [Laughter.]

MR. RUBENSTEIN: OK. So, in California that would be expensive.

MR. GELSINGER: You know, being in the political domain, you know, there are other people here that are good at that. You know, I like to build things. I like to run companies. I like to innovate technologies and products. You know, I want to be, you know, associated with working on a piece of technology that touches the life of every human on the planet in every – [off mic] – of life. That's what I want to do.

MR. RUBENSTEIN: Did your parents live to see your success?

MR. GELSINGER: You know, my father just passed away September 4.

MR. RUBENSTEIN: So, he must have been very impressed with what you achieved.

MR. GELSINGER: And was just with mom for Thanksgiving. And they would always say they love all of their kids. But I knew I was the oldest boy in a German farming family. I was always special.

MR. RUBENSTEIN: Did they ever call you with advice about how to run Intel?

MR. GELSINGER: You know, of course they would give me advice. You know, Pat, the stock is down today, what'd you do? [Laughter.]

MR. RUBENSTEIN: And what do your grandchildren call you?

MR. GELSINGER: Papa.

MR. RUBENSTEIN: And do you give them technology advice or they don't need it?

MR. GELSINGER: So, my – you know, my little granddaughter Alice, every time she plugs in a USB device, she says: Thanks, papa. [Laughter.]

MR. RUBENSTEIN: Wow, that's pretty good.

MR. GELSINGER: That's pretty good.

MR. RUBENSTEIN: Thank you very much for an interesting conversation.

Patrick Gelsinger
Chief Executive Officer
Intel Corporation

Patrick (Pat) Gelsinger is chief executive officer of Intel Corporation and serves on its board of directors. On Feb. 15, 2021, Gelsinger returned to Intel, the company where he had spent the first 30 years of his career.

Before rejoining Intel, Gelsinger was CEO of VMware. In that role, he transformed VMware into a recognized global leader in cloud infrastructure, enterprise mobility and cyber security – almost tripling the company's annual revenues. Gelsinger was also ranked the best CEO in America in 2019, according to an annual survey by Glassdoor. Prior to joining VMware in 2012, Gelsinger was president and chief operating officer of EMC's Information Infrastructure Products business, overseeing engineering and operations for information storage, data computing, backup and recovery, RSA security and enterprise solutions.

Gelsinger began his career in 1979 at Intel, becoming its first chief technology officer, and also serving as senior vice president and the general manager of the Digital Enterprise Group. He managed the creation of key industry technologies such as USB and Wi-Fi. He was the architect of the original 80486 processor, led 14 microprocessor programs and played key roles in the Intel® Core™ and Intel® Xeon® processor families, leading to Intel becoming the preeminent microprocessor supplier.

Gelsinger earned several degrees in electrical engineering: an associate degree from Lincoln Technical Institute, a bachelor's degree from Santa Clara University and a master's degree from Stanford University. He holds eight patents in the areas of VLSI design, computer architecture and communications, is an IEEE Fellow, and serves as a member of the National Security Telecommunications Advisory Committee.

Gelsinger and his wife have been married for over 30 years; they have four children and eight grandchildren. He is also a published author and speaks frequently on faith, work and philanthropy.