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Patrick Gelsinger
Chief Executive Officer
Intel

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Signature Breakfast

Moderator: John C. Williams
President & Chair
Federal Reserve Bank of New York
Chair, The Economic Club of New York

Introduction

Chair John C. Williams

Good morning and welcome to the 729th meeting of The Economic Club of New York. I'm John Williams, Chair of the Club and President and CEO of the Federal Reserve Bank of New York. The Economic Club of New York is known as the nation's leading nonpartisan forum for discussions on economic, social and political issues. More than 1,000 prominent guest speakers have appeared before the Club over the past century and they've established a strong tradition of excellence.

I'd like to extend a warm welcome to the students from NYU Stern School of Business, Rutgers University, and Mercy University, who are joining us virtually today as well as members of our largest-ever Class of 2023 Fellows – a select group of diverse, rising, next-gen business thought leaders. And for Club members, as a reminder, applications for our 2024 Fellows program are now available on the Club's website.

Today, I am honored to welcome our special guest, Pat Gelsinger. Pat is Chief Executive Officer of Intel Corporation and serves on their board of directors. He has more than four decades of technology leadership and experience driving innovation, with 30 of those years serving in Intel engineering and executive roles. As Pat and I were talking this morning, he was leading the team that developed the chip that allowed

me to write my dissertation 30 years ago. So definitely an important contributor to my own career.

Before joining Intel, Pat was CEO of Vmware and was ranked the Best CEO in America in 2019 according to the annual survey by Glassdoor. Pat began his career in 1979 at Intel, becoming its first Chief Technology Officer and also serving as Senior Vice President and General Manager of the Digital Enterprise Group. He managed the creation of key industry technologies such USB and Wi-Fi. He was the architect of the original 80486 processor, and led 14 microprocessor programs, played key roles in the Intel Core and Intel's Xeon processor families, leading to Intel becoming the preeminent microprocessor supplier.

Pat holds eight patents in the areas of VLSI design, computer architecture and communications. He's an IEEE Fellow, serves as a member of the National Security Telecommunications Advisory Committee, and sits on a number of councils and forums.

So the format today, we'll start with opening remarks from Pat followed by a conversation that I'm honored to be moderating. As a reminder to everyone, this conversation is on the record, and we do have media on the line and in the room. So without further ado, please everyone join in welcoming Pat to the stage.

Opening Remarks by Pat Gelsinger

Thank you so much, John, a pleasure to be here. I'd like to start out with a simple question to you. What aspect of your lives is not becoming more digital? Right? You can think about that. Okay, well, the phone in your pocket, right? The lightbulbs that you have, the thermostats that you have. The autonomous vehicle that you'll be driving...or not driving soon. Every aspect of humanity is becoming more digital, and everything digital runs on semiconductors. Semiconductors, based on God's gift to humanity, this 4x4 crystal structure that we've been able to bend and shape and put every other particle, well, only about a third of the particles of the periodic table, into it now. The magic of Moore's law, and this idea that everything digital runs in semiconductors. Semiconductors have become pervasive in every aspect of humanity.

And then Covid, and all of a sudden you realize how dependent you were. The economy comes to a stop. We have entire manufacturing lines in Detroit coming to a stop. A $30,000 car can't ship. An entire manufacturing line stops because of a $2 semiconductor that's not available. And we realized in that how important semiconductors were, but we also realized over 30 years of industrial policy, that we went from in the West, in U.S. and Europe producing 80% of semiconductors to 20%. What happened? Why did we go from 80% to 20%? Was there a vote in Congress that said get rid of this terrible industry? No, there wasn't.

But there were votes in Korea, China, Taiwan, Japan, to get this industry. A sustained focus on industrial policy over decades and this critical industry that underlies every aspect of humanity went from 80% to 20% and on a continuous decline. And while there never was a vote in the U.S. Congress to get rid of this industry, there were lots of votes to focus on near-term profits, to not make investments in long-term capital-intensive industries, and to be very happy to see manufacturing – because those are low-end jobs, we don't care.

And as a result, these long-term policy decisions have led us to be dramatically dependent on Asia for the most important piece. And I'll argue today that 50 years ago, right, we'd say oil reserves defined the policy for the last five decades, the geopolitics of the world. Today, and the future, where technology supply chains are – manufacturing, R&D, research – is more important for the next five decades. So let's build them where we want them.

In fact, that was part of the U.S. CHIPS Act. And when I came back to be CEO of Intel two and a half years ago, a lot of shoe leather on my part and others got burned to get the CHIPS Act done, the most important piece of industrial policy legislation in the last 75 years. Let's build again. It was one of the proudest days of my career when I got to stand on stage with the President in Ohio and declare, "Today ends the Rust Belt. Today begins the Silicon Heartland." Rebuilding manufacturing this technology on

American soil.

And today, when we think about that, why did this industry emerge in Asia so prominently over 30 decades, and today we have this dramatic gap? Forty percent cheaper if I were building these factories in Asia. We need explicit policy support to reverse a 30-year decline. And as I've said, a moonshot is by the end of the decade, 50% of leading-edge semiconductors back in the U.S. and Europe. Going from 80 to 20 to 50% in a decade, that's a stunning shift and reversal of policy.

And we're seeing this industry, today about a $600 billion industry, that undergirds about 20% of all economic in the U.S. today, and about two-thirds of all productivity improvements as a result of technology. This is an extraordinary industry and expected by 2030 to be a trillion industry. But it's not just our economic, it's not just our middle-class jobs in manufacturing, it's our national security as well. This is vital to our, no, this is the most vital thing for the future of our nation and our national security.

When my wife and I were discussing, and I was offered the job of coming back to Intel, she said, how much are you going to have to work? And how long are you going to have to work? And I said, on the how much, I don't know, honey. And we started to do every 90-day sprints where we'd reflect on the last 90 and we talked about the next 90. So this weekend I do that with my wife, and next weekend I get to do that with the

financial analysts in our Earnings Call. How did the last 90 go? How are the next 90 going to look?

And I said, on how long, it's not less than five years, to turn around the company, rebuild the industry and change the specter of manufacturing in America. Well, here we are, two and a half years into the "not less than five years." We're sort of halfway. I laid out an audacious plan. You know, the five years before I came back to Intel, we invested $50 billion in capital. I laid out a plan that said we're going to more than triple that and invest $150 billion-plus in capital over five years. Some of you here on Wall Street, you know, as I would say the line between bold and crazy on Wall Street is a thin one, and most of you aren't sure which side of the line I sit on.

This is an audacious plan to rebuild this industry. Going from $50 billion to $150 billion, taking our free cash flow negative, saying that we're going to do five nodes in four years. A typical node would have required about two years to get done and we said we're going to get five of them done in four years, a decade of work in four years, double time to go building back. And here we are halfway through the journey and I'm happy to say, on track. We're getting it done.

And as we look to the future, I'd say, hmm, Covid was a big wake-up call for us. But as we think about things like AI and generative AI, they all have one common thread

underneath them. They're all built on silicon, and probably what will be the most dramatic productivity, economic boom for us, will be again driven by silicon. And thus, I've termed, you know, created a new term for this period of economy in front of us. Maybe we'll change the name of the Club. The siliconomy, the silicon-based economy for the future. So I'm a happy member of the siliconomy. And unbeknownst, so are you. So, let's stand at the podium, John. We can make this work.

Conversation with Pat Gelsinger

CHAIR JOHN C. WILLIAMS: Absolutely. We're going to be able to do this. So the first question actually. You talked a lot about the new technology, the siliconomy, so we're going to start with just making sure that everybody understands, and I mean me. When you talk about artificial intelligence, do you think about how, this is a game changer. So talk a little bit, like, well, what does it mean for your business, for Intel, and what does it mean for all the businesses represented in this room and in our virtual audience? What is it really the game changer about?

PAT GELSINGER: Well, you know, the analogy I'd say that I think is most relevant would be when the internet first emerged. And all of sudden there was all sorts of, you know, what does this enable? How does it change business? How does it change economy, etc.? And we didn't even know quite what a web manager was at one point.

Well, now it's, of course, a critical part of your leadership team, everybody, and so on.

And I think AI has that same dramatic transformational impact and it will go across, and I think uniquely with AI, it will wash across the white-collar assignments, whether that's legal, financial, but it truly will transform. All of a sudden, vision, audio, natural language processing, productivity gains will just be extraordinary as a result of AI. And we're seeing very strong evidence that different classes of functions are only 10,000 times more productive when done on AI systems. And anytime there's a 10,000X improvement, there's money to be made, but dislocation will occur as well.

You know, for our business we've said our job now is to put AI everywhere. It's not just these ultra high-end training machines that we're seeing lots of discussion on and AGI, artificial general intelligence kind of systems, but it's how do we permeate it everywhere. So at our recent innovation conference, we described the AI PC, Andy Grove called the PC the ultimate Darwinian device, so how do I make it the AI PC? And one of the things we showed was the PC locally is now able to record everything that you do, every phone call, every Teams or Zoom call that you're on, every web page that you search. And then you say, well, when did I speak last at the Economic Club, and it will give you a full summarization of that event. Put it on your calendar. Schedule the next thing and remind you of all the things that you saw, that you were there.

You know, for me personally, I have a disability. My family is hard of hearing. I'd like you to see my neural network on my AI, it was built into my hearing aid. So it will permeate every aspect of your respective lives, from the smallest things that you do to every web page, every web search will become an AI-powered web search, and we'll be building it into every product that we build.

CHAIR JOHN C. WILLIAMS: As an economist, I guess my question is, is this going to lead to a huge investment boom like we saw in the 90s and 2000s with the internet and internet-driven business? Or is this going to be more of a, kind of a gradual process of developing new technologies and productivity improvement? So is this going to be like this huge wave of change that happens in the next few years? Or is it something that you think is going to last longer?

PAT GELSINGER: You know, I think the AI cycle, much like the internet cycle, will introduce two decades of fundamental disruption. And there's going to be, you know, the Gartner hype cycle will be alive and well. There's going to be booms and busts and valleys and so on. I like to joke that when I was designing the 80486, and that's this chip here I have on my lapel, this was in 1986 when I was architecting the 486, I said, we're going to make the 486 a great AI chip, in 1986. What happened for the next 40 years of AI? Nothing.

And then all of a sudden, the data got big enough, the compute got good enough, the algorithms got refined enough, and now we've had six, eight years of extraordinary momentum where now AI vision systems, AI voice systems, AI inferencing is better than humans can do on those same tasks. And it was an overnight 30-year success. It just took that much time to curate. And I think now we have a solid, at least decade, if not two decades, where there's going to be investment cycles, new companies born, companies that embrace AI and ride its growth dramatically. And I believe this will be the driver of economic growth, dislocation, and investment for at least a decade, more likely two.

CHAIR JOHN C. WILLIAMS: So, one person mentioned to me that a lot of the AI that we've seen up until now has been basically versions of machine learning and developing that in the ways you talked about. But the generative AI, the possibilities of the future are just fundamentally different in terms of how, so can you talk a little bit about, like what is it about, like what's really changing in AI versus where we were maybe ten years ago where people said we've been using AI all along?

PAT GELSINGER: You know, really if you think, the field of AI is now about 50 years old if you go and study it. We've gone through multiple AI winters. Just like my 486, it was not the great AI chip, so you've seen it. But now we're in a period of time where about every two years you're going to see a major algorithmic breakthrough in AI where

there's going to be new classes of problems that now become solved. And obviously, you know, GPT4, generative AI, particularly for text generation was a major breakthrough.

And I do expect that the next phase of AI is going to be much more around a multi-modal AI as it's called today, where you're able to not just infer in text, but you're going to be able to do that in other domains as well, such as animation, video generation, speech generation, all of those, and literally will record every word that you ever said, every speech that you ever said, and will have a generative AI version of you that combines voice, video, and text, to be a better you.

CHAIR JOHN C. WILLIAMS: Not for another five years, I got five more years in this career.

PAT GELSINGER: No worry, no worry. But I think this whole idea of multi-modal AI and, more broadly, I fully expect that there is going to be lots of discussions on what's referred to as AGI, where we're going to be able to have AI systems in the next decade that truly will become indistinguishable from human behavior on broad sets of topics. It's not just going to be that we can beat humans on medical exams, but truly on a broad set of topics, you know, will be better than human behavior on many of those as a result of AI.

CHAIR JOHN C. WILLIAMS: I know that the people, virtually, it's hard to hear. So one thing that comes up a lot, though, is this issue of cybersecurity. And you just mentioned, and we all know, have seen the Tom Hanks story and these others, our identities are going to be easy to mimic. Our voices already, I guess, can be mimicked pretty accurately. So how do we think about AI, and maybe I want to switch a little bit to quantum computing too, and think about how new technologies, is it making it harder to preserve our privacy, preserve our information? Also, let's talk about what Intel's role is in all of this.

PAT GELSINGER: Now, you know, was the printing press good or bad? It was used for all sorts of good things, and it got used for all sorts of bad things. So was it good or bad? And generally, technology is neutral. You know, by themselves they can be bent for bad or bent for good. And our job, as both technologists, scientists, as well as policymakers, is to be constantly bending them for good. And I would say anytime that we can't show that it is a good outcome for humanity, the engineering ain't finished.

We have to be able to demonstrate, you know, if I let the autonomous vehicle go wild on the road and it's breaking laws, putting people at human risk, the engineering is not done. And in that regard, today there's technology available that I can do deep fake detection with high 90s probability. I think regulation should require that that be part of the delivery of video. It's not that hard to also say I can use it for incredible generation of

animated characters and so on, but I believe there should be requirements. It has to be good. And if it's not proven that it's good for society, better than current systems, the engineering isn't yet complete.

And that should be this contract between technology, society, policymakers, regulators, that we're constantly bringing these extraordinary breakthroughs, and saying we're making them good, in every domain. And they have to be regulated appropriately and brought forward. And generally I sort of view that a lot of technologists, a lot of us Bay Area folks, it's sort of like those East Coast and Washington folks, we're like cowboys. We ride in, we make sure they don't do anything bad, and then we go back and want to innovate. That doesn't work, as these become so pervasive to humanity. And I think our social systems, a lot of the social web has shown, un-managed, these things aren't good. And it's our job to shape them for good every day.

CHAIR JOHN C. WILLIAMS: Quantum computing.

PAT GELSINGER: Quantum computing, so how many of you know how a transistor works? A few of you do, right? For the most part, you don't need to know how a transistor works. We just string together millions or billions of them and we're able to do great things like you have in the phone in your pocket. And a quantum computer, the transistor, this little on-off switch that we string them together in magic ways, gets

replaced by a qubit. You know, if you were to write a quantum effect that actually is not representing one state, but it's representing many states simultaneously. And because of that, some problems are solvable in quantum space that aren't easily solved in digital space.

So quantum computers, you know, will be able to solve problems that aren't easily solvable today by digital techniques. And some of those will be things like protein folding and being able to do proteomics. But the biggie, security. And that's the one that all of you should be very thoughtful about is how will quantum computing change security. Because today people are taking and copying your digital information, our nation's digital information, and knowing that when we get quantum supremacy, you know, the day a quantum computer can be big enough and good enough, then I'll be able to solve and go back and look at that data and be able to crack the encryption associated with it.

That's why, you know, NIST just released what are called the Quantum-Resistant Encryption Algorithm. So, to me, you know, we had Y2K, for those of you who remember that, we will have Y2Q. Before the end of this decade, we must systemically be upgrading all of our security algorithms to be quantum-resistant. Because I believe sometime in the early 2030s, we will – and I have a big quantum program, one that's based on silicon qubit, so if I can make them work, if I can make these little qubits work, I can produce a lot of them, because I get to do it in all those big silicon factories that

we're running as well.

And if I can produce a lot of them, we will create a quantum supremacy supercomputer that will complement high-performance computers, AI computers, with quantum computers. And I believe that happens sometime in the early 2030s, we will be able to at that point. And by then, all of us will need to have our security upgraded. And as those things emerge, we're going to be able to solve problems we can't do today. Some of those in the medical domains, some of those in the finance domains, some of those in schedule domains, you know, quantum computer will be a major new breakthrough just like the transistor was 75 years ago.

Oh, and by the way, but it won't replace the transistor because most of you are not going to carry around cryogenic coolers in your pocket. And when you see a big quantum computer, it's really not, you know, it's just a fancy air conditioner with a little quantum thing on the bottom of it. So don't worry about...it's not as cool as it looks.

CHAIR JOHN C. WILLIAMS: You heard it here. You will not be carrying around a...what was it? A cryogenic...

PAT GELSINGER: Cryogenic cooler. Because it needs to operate below 1 Kelvin.

CHAIR JOHN C. WILLIAMS: So what's Intel's role in all of this? And going back to your remarks, how does the U.S. maintain or gain that leadership back in quantum computing and AI?

PAT GELSINGER: You know, first, on a lot of these things, you know, there's a book written, a friend of mine, Kai-Fu Lee, that describes that the U.S. already failed in the AI race. That was published seven, eight years ago. And did we fail in the AI race? No. Every great AI innovation has emerged from U.S. and democratic society. And basically the argument was that they had more data in their society, you know, China and government policy, they were going to be able to harvest that data more effectively. And what we showed in the AI race so far was that an open, innovative research-oriented society won. So we have the data. We have the computing. We have the algorithms. So we've won all of the major steps in AI so far.

And when I think about semiconductors, it's that same innovative research, but a semiconductor you must manufacturer as well. And that's what we lost. Our industrial policies versus those of Asians led for all of manufacturing to move outside of the U.S. These are great jobs. This is so important. And if you want to stay ahead in the race of technology, we must be investing in research, in long term research. I think we have to change our immigration policies. If the world wants to send us their best and brightest, let's say yes to them staying. And then we have to have the capital and manufacturing

policies to build them here. And that's the entire middle class, that's the silicon heartland that we need to rebuild.

And, as I would say, our policy should be maximize our exports to the world, carefully manage our technology leakage to the world, and ally with our allies on every aspect. And post-Ukraine, we have extraordinary alignment with the world on democratic principles that we haven't seen for decades. I truly believe this could be the best cycle of innovation, combining good industrial policy with the numerous areas of innovative leadership. And finally, long-term research investments. The CHIPS and Science Act, as I would argue, the most important piece of industrial policy since World War II, it was the CHIPS and Science Act. And we have yet to fund and get the science piece of that underway. That is building the seaport for decades of leadership to come.

CHAIR JOHN C. WILLIAMS: So the question on this, you mentioned that AI and you mentioned the CHIPS Act are fundamentally changing technology, productivity, and the workforce. So talk a little bit about that. The last wave of innovation we had in our economy and others did see the hollowing out of jobs in the middle class. A lot of jobs like bookkeeper and others don't exist anymore and other jobs have been created. AI sounds like it could be the next big wave of that. You mentioned this in finance and in law, in other areas. But talk a little bit about how you see that playing out over the next decade. What should we be preparing our workforces for? What are the jobs of the

future? And maybe even thinking about the education of our workforce to be really productive and successful in this AI future.

PAT GELSINGER: You know, when we announced Ohio...(Audio Issue)...in the nation, because essentially the tech boom affected the coast, not the center of the nation, not that resilient core that we've been part of. And the thing that excited me most when we did that announcement was that we had ten of the top Midwest universities come together, and this was like Buckeyes and Michigan State actually cooperating. I mean that ain't happened in like 100 years. And they're coming together for one cause – workforce development of the future. And to me, that was such an extraordinary statement. We've committed over $100 million matched by NSF funding to go do that workforce of the future.

And clearly, as you think about things like AI, you know, they're going to be disruptive. I mean there's lots of fields that are going to be disrupted in this process as well. And it's not a question of whether that disruption is good or bad because, as most studies have shown, every time one of those disruptions occur, they destroy one job but create one and a half jobs. But those jobs need to be created, need to be trained for, we need to be leaning forward.

And I do think this idea of workforce development across the spectrum of jobs, and to

me, that's why bringing construction, manufacturing, you know, this is from entry-level union workers. Today, I have 6,000 construction workers in Ohio. I have 5,000 construction workers in Arizona today. They will create on the order of 3,000 jobs for technicians at both of those sites as well as the highest end bachelors, master's and PhD research work that goes on. We must be bringing back, not just the super high-end disruptive, you know, technologies, but across the workforce spectrum, and that requires explicit policy on long-term workforce development across the spectrum. You know, from high-skilled trade workers all the way through the best research, PhDs on the planet.

CHAIR JOHN C. WILLIAMS: And when you think about how this all kind of fits together with kind of the broader contours of some deglobalization going on and fragmentation in the global economy, and obviously the efforts – the last thing I want to mention here in this question – efforts about the green transition. How does this all fit into the world, kind of the broader geopolitical kind of considerations that are happening around us?

PAT GELSINGER: One of the standard things that I've said is we need globally-balanced resilient supply chains. It's not like we're going to move supply chains out of Asia. But to say that I have a single port that stops the world economy, that's not okay. To say that I have a single island, and just think about how precarious the situation with Taiwan is. They're entirely an oil nation that has less than four weeks of oil reserves on

the island. We've only seen the Taiwan Straits blockaded five times, I think, in the last 17 years. Two-week blockade, the island is browned out. What does that do to your semiconductor supply chains?

We need resilient supply chains. And that doesn't mean they're not inter-dependent with global supply, but we need resilience, balanced supply chains for the future. And those supply chains have to be in Europe, have to be in Asia, and must be in the Americas, the three great economic axes of the world. So building that resilient supply chain of the future is at the heart of what we're doing. You know, in parallel to driving the U.S. CHIPS Act, I also helped to create the EU CHIPS Act. They started a year later than us. We might see the first funds dispensed from the EU before the U.S. CHIPS Act funds. Just saying...

But the agenda is globally-balanced resilient supply chains for the world, for those critical minerals, the critical technology supply and, of course, fabrications. And if you move a fab, you know, I had this fabulous day when we announced the Gordon Moore Research Park, and for those of you in the industry, Moore's law, Gordon Moore, we named our key research location in Oregon after him, the Gordon Moore Park.

And they gave me, the governor and the two senators from Oregon gave me a picture when we were inaugurating that, that showed the site 50 years ago before Intel, and the

site today. It was a little farmhouse and today it's a technological metropolis of not just greater than $60 billion of Intel's capital at our Oregon location, but over 120 companies that now surround us in that area – chemical companies, Cloud companies, you know, technology innovators all around us. This is building those hubs that become the spawning places of innovation, job creation for the future, resilient supply chains that are interconnected, but able to meet the core of economic and national security requirements of each, of U.S., Europe, and Asia respectively.

CHAIR JOHN C. WILLIAMS: Okay, I think I've got this mike working, but your mike I'm not sure. The show must go on, but I got a mike here, so this might be a little easier, at least for me. So we've talked a lot about technology. We've talked about AI. We've talked about quantum computing. We've talked about the global landscape around technology and productivity. So maybe we turn it back to you and your leadership journey and talk a bit about, describe your leadership journey and your style. You said, I think you said, or I said four decades of experience, and now in this role for the past two and half years. So talk to us about that.

PAT GELSINGER: Yes, you know, I'm an embodiment of the American dream. Both of my parents were first through eighth grade, no high school education farm kids as I was growing up in Pennsylvania. We lived in the one-room schoolhouse that my dad went to school in. And that's today where my mom lives in that house. When I was growing up,

you know, they said go to school, get your PhD. I don't think mom or dad even knew what a PhD really was. But it was go to school, get an education, don't be a farm kid like we were. And that began the journey.

I became a technician at Intel at 18 years old. And skipped my last year of high school, moved to California as an 18-year-old kid to work at Intel in microprocessors at the lowest rung that you possibly could in the company. And then I wrote my own personal mission statement in my 20s, and I said I want to become CEO of Intel, an audaciously ridiculous thing to say, It was just something crazy to write down. And then in my mid-30s, it became maybe this could be true. And as I met with Grove, Moore and Noyce, you know the trinity of Silicon Valley, as I called it, the people that put silicon into Silicon Valley, maybe I can do it.

And I became what I call the armchair quarterback, every day saying, hmm, could I have said what Gordon said? What if said what Andy said? What if I'd done what Robert did? And that drove me. And then when I was pushed out of Intel 13 years ago, it was most devastating day of my career. And then I went to EMC and then to VMware, and I was outside of Intel almost to the day of how long Steve Jobs was out of Apple – growing, maturing, learning new leadership skills.

And now two and a half years back as the CEO, I came back to restore the iconic Intel

in honor of Gordon, Andy, and Robert. Secondly, it was to rebuild its position with the technology industry. When my granddaughter plugs in a USB stick, she says, thank you, Pop. Wi-Fi, connecting, you know, the role of technology in humanity, from magical to mundane in just a few years. That's what the power of technology, improving the lives of every human on the planet. But finally, to rebuild western manufacturing at scale. It is that important for our economic and national security into the future.

And as a leader, you know, rebuilding a great iconic company that was mismanaged for a decade and a half, that is hard. Rebuilding its credibility in the technology industry, that is hard. Rebuilding an entire industry of manufacturing and supply chains, that's noble. That is a calling that I feel every day, and as a Christian man and believer, you know, I love the Roosevelt Man in the Arena speech. We're going to get bloody, we're going to get knocked down, we're going to get dusty, but we're going to get up and we are going to make that happen. And that's the vision I tell. I say, you know, if you're part of my team at Intel, you are here for one purpose, to make that mission true each day.

And I think the role of a leader is to be clear-minded about the heart, but also consistently, purposely, relentlessly describing the mission, vision of the organization and how truly humanity depends on what we do every single day.

CHAIR JOHN C. WILLIAMS: So I'm meeting, I know we have a lot of the Fellows

listening in to this, and I'm meeting with them later today. So I'm guessing that every one of them who are at that point in their career, when you wrote the note that I'm going to be the CEO, they're all writing that note and planning to be the CEO of whatever organization they're in. So I'm looking forward to hearing that from them firsthand.

But thinking about aspiring leaders, think about aspiring leaders, we have this largest class of fellows we've ever have. We have people from all different companies and organizations here, so what is your one piece of advice you give to an aspiring leader today?

PAT GELSINGER: So the simple phrase I've used is you need a career MAP, M-A-P. M, mentors. You need people that are here to make you better. And that's why sessions like this are so useful for some of us old codgers to engage with some of you, you know, young potential. Andy Grove became a mentor of mine in my 20s. And as I described, mentoring with Andy Grove was like going to the dentist without Novocain. He was hard. He was demanding. I worked with him for 35 years. I mentored with him. And over that 35 years, he complimented me four times. I have them all written down, notarized, in my files. But that's the kind of people that you need, people to make you better. Everything that God meant you to be.

Second, audacious goals, you know, things that are truly way bigger than you could

accomplish yourself, but that are going to drive you. And then finally, as I say, P, you know, live in your passions. What are you passionate about? Find it. Do it every day. The days are short and the career is fulfilling if you live in your passion. So every one of you needs a career MAP.

CHAIR JOHN C. WILLIAMS: And so one thing that, you know, I also hear from people starting out is this sense that I have to figure it all out at the very beginning. And it sounds like you kind of, you started when you were 18, at the very entry level job. But what's your advice to people like me, where when I was in my 20s, I didn't know what I wanted to do. I knew I had some passion around public service. I had some of these things. But, you know, you talked about mentors, but what other advice about helping people figure out kind of what's the path forward?

PAT GELSINGER: Well, you know, in a technology-driven world, the idea that you're going to work, you're going to go to school for ten years, you're going to work in a field for 30 years and you're going to retire, that is gone. And instead, what you will experience is a shortening career span and a lengthening career duration where you may be in assignments in five, seven, eight years and then you're moving on to the next dramatic thing.

As I look at my leaders, as I'm trying to develop them, I want them to have a team, right,

I want them to have depth, substance, leadership, you know, distinguished in their field, and then a curiosity for every other domain that they interact with and learning skills in adjacent other areas as well. So I would say each one of you, whatever role that you may be in today, distinguish yourself in that capability, but then be also preparing for the next thing you want to do.

My career journey at Intel, I only had one objective when I started as a technician. I wanted to be the engineer on that side of the table telling the technician what to do. And then I want to be the engineering manager telling the engineer what to do. And then I wanted to be the director telling the engineering manager what to do. Careers are not these linear things.

I spent more time as a social leader in the last two years. I had to go back to school on how the House and the Senate worked. And then I learned how they didn't work when I was trying to get the CHIPS Act done. Whole new domains of leadership. But what extraordinary opportunities to build careers from wherever you are, and it's a journey. Enjoy the journey. Be fulfilled every day. And when you're not being fulfilled and challenged, time for the next thing.

CHAIR JOHN C. WILLIAMS: So speaking of being challenged, you mentioned the past two and a half years, you've been CEO of Intel. You just described how you had

audacious plans. You had a transformative approach, basically reversing course is how I would summarize what you said, for an organization that's been around for a very long time. So talk a little bit about how have those, from your point of view, this was the job of your dreams. This is an organization you care deeply about. But how do you feel about these last two and a half years? And how are you going to get your next two and a half years to be successful?

PAT GELSINGER: Well, we think about what we've done, we basically lay it out, a five-year journey to create what would be the most capital-intensive buildout, you know, potentially in any industry, in any time ever, in that period of time. And when I stood in front of Wall Street and said we're going to take the company free cash flow negative, we're going to lose money. We're going to put a debt on the balance sheet. And if you didn't get the message of the new strategy, we're going to do that for several years in a row. And what was Wall Street's reaction to that? Not particularly positive, right, associated with it.

Well, here we are halfway into the journey, starting to show life, starting to show some momentum associated with it. The engineering is back. We're getting the best transistors to be built. And Intel has invented every transistor breakthrough for the last 30 years. We're doing that again. Getting back to leadership. We've opened major manufacturing. Our engineering execution is getting back to what it was before. So here

we are, I'd say halfway through the journey. I'd give us a passing grade. Not an A, but we're no longer an F. And against that, we'd say it was a five-year journey. And if you're going to grade us on the 90-day shot clock, okay, we're going to be a failure, because it's a five-year journey.

It's that hard to rebuild and shift industries, and I do think we've made tremendous progress in that period of time. Every product that we've had on the roadmap is on or ahead of schedule. Every process technology that we described is on or ahead of schedule. Others are stumbling to build manufacturing. We're accelerating those manufacturing buildouts. We are a passing grade. But we weren't here to be passing, we're here to be exceptional. And that's going to be a couple more years.

CHAIR JOHN C. WILLIAMS: One of the things you mentioned is a lot of the companies who are doing the research and development in AI and some of these other innovative spaces, they tend to be in the startup world, very small, very nimble, agile companies. Intel is a huge, big company. You're focused on enormous investments, enormous kind of building out the company's capacity. So how do you stay nimble and competitive with this Silicon Valley kind of mentality?

PAT GELSINGER: Yes, and it's interesting because right now every one of those startup, nimble, tiny AI companies is needing to partner with a big company because

building these big training environments is billions of dollars to create the biggest supercomputers that have ever been built on earth. We are going to see the explosion in compute capacity. And if you think about that, today about 4% of the earth's power is used in IT. That's probably 5Xs over the next decade, you know, 20%, literally a 5X increase. And these are going to be extraordinary compute centers that get built for leading edge AI.

So, it is how do you partner then to say we have the capital to go build the fabs and these massive data centers with these innovative, you know, creative, new algorithmic domains and the new industry disruptions that will occur. So, you know, being developer-centered, and having the Intel capital investment arm has always been a critical aspect of it. But also a lot of this falls onto me and the senior leadership. AI and Emad, you know, of Stability.ai, and Anthropic, and so on, because, you know, the CEO has to be on the front end.

And I like to say for every technology company, you almost always see that it's led by a technologist because as they get big, they still have to stay very small, very nimble, and very on the front end of technology. And then you need to build an organization that's passionate about technology. We are a technology company, period. Right? Oh, yes, we need to do good financial return. We need to do all these other things. We're a technology company, and we love engineers that want to be a little bit raw, you know,

dress lousy, and do incredibly innovative things. And that's who I want on my team.

CHAIR JOHN C. WILLIAMS: We're almost out of time, so the least question I guess, we've talked a lot about innovative technology. We've talked a lot about what the future holds. I mean, what are some of the things, besides AI, besides quantum computing, besides all the things you've talked about, that are also on your radar, or should be maybe, more importantly, on the radar for the people in this room about what changes are ahead in the industry?

PAT GELSINGER: Well, you know, when you think about, I've called it the five superpowers. Everything computes, everything and everyone is connected. Infrastructure, we've had Cloud, edge computing, and edge, I think will be the next wave of major applications because we'll be pushing AI to the edge. So infrastructure, sensing, and my computing devices will become sensory devices. I showed you my hearing aid. You know, every one of our human sensory deficiencies will become digitally enhanced superpowers as well. And finally, the AI, this ability to take that data and compute to do it at scale. I've called these the five superpowers.

And against those superpowers, I think they change everything. The next time I see you these will be my digitally-enhanced glasses that will say I last saw you at the Economic Club meeting in New York and remember this about your child and going to college.

Okay, got it. And I'm going to get that through my neurally-enhanced hearing aid when I see you, and you won't know it. You think I'm looking at you, but I'm actually getting an audio transcription of my wife's text message right now. And you thought I was smiling at you. I was thinking of my lovely bride. All of our senses are going to become digitally and AI-enhanced. What time to you wake up in the morning?

CHAIR JOHN C. WILLIAMS: About 6:00.

PAT GELSINGER: About 6:00. Tomorrow morning your digital device wakes you up at 5:00 am instead.

CHAIR JOHN C. WILLIAMS: God forbid.

PAT GELSINGER: And it says to you that yesterday you had your third heart irregularity this month. And so, as a result of that, you've triggered now a risk factor. I've now uploaded all of your biometric information. I've taken that and run it against your DNA class. I've scheduled you to the heart doctor this morning. I had to get you up early because it was on the other side of town. I've rearranged, your AI bot has rearranged all of your morning calendar. I have loaded the directions into your self-driving car. I've moved your Starbucks order to one that's on the way. And, of course, since you are going to the heart doctor, I made it decaf.

CHAIR JOHN C. WILLIAMS: Now, being a Bay Area person, you should have said Pete's, not Starbucks, okay. We are out of time. But one thing, though, I don't know if many people in this room know this, but I play video games. And so you promised me, you're promising me that I will be a superpower video game player in the future, because my sons have pointed out that as I've gotten older I have lost my fine motor control, and I really should put the controller down. But you're telling me that my future is bright.

PAT GELSINGER: We're giving you the biggest AI supercomputer behind you. It'll make up for all of your ___.

CHAIR JOHN C. WILLIAMS: On that note, thanks so much for sharing your time with us. It's been a fascinating conversation.

So my job in the last one minute is just to remind everybody here and who is watching virtually that we've got a lot of speakers coming up this fall. We encourage everyone to invite guests to our various events. This Thursday, October 19th, we have The Honorable Jay Powell speaking at a luncheon, obviously Chair of the Federal Reserve. On October 25th, we've got a webinar with the President and CEO of Northwell Health, Michael Dowling.

And now let's go to November. We have great events in November. We have Erika James, Dean of the Wharton School of Business at the University of Pennsylvania, and I'm looking forward to moderating that discussion with Erika. We'll be hosting a webinar with Paula DiPerna and Abby Joseph Cohen, a webinar discussion honoring Harry Markowitz, as well as a luncheon with General David Petraeus. So some great events coming up. And then a very special event in early December. On December 7th, we will host our end of year dinner honoring Bill Gates as a Peter G. Peterson Leadership Excellence Award recipient.

And finally, I'd like to thank and recognize all of the 366 members of our Centennial Society who are joining us today as their contributions continue to be the financial backbone of support for the Club. And thank you to everyone who has attended virtually and in the room. We look to see you at future events.