

THE FUTURE OF WARFARE: A CONVERSATION WITH ERIC SCHMIDT

Announcer 00:00

Please welcome Executive Chairman and CEO of Relativity Space Eric Schmidt, in conversation with Rick Newman, senior columnist at Yahoo Finance.

Rick Newman 00:15

I know you're not applauding me. You're not applauding the press. You're applauding Eric, as you should. Most of you know Eric Schmidt as the former CEO of Google during its formative years, but he has done a lot since then. Recently wrote a book with Henry Kissinger. He has formed an artificial intelligence think tank in Washington, DC, very involved with artificial intelligence. He advises the Pentagon, consults with the Pentagon on military intelligence, and he has spent a lot of time in Ukraine—which, as everybody in here undoubtedly knows—is the site of the largest land war in Europe since World War II. So Eric, tell us what is going on in Ukraine that we need to know.

Eric Schmidt 00:15

Hi. Well, the war is the most frightening thing you've ever seen. The death and destruction, the number of people killed on both sides, will just destroy your heart. And the first phase, of course, you know, Ukraine was not prepared for the war, which, for the record, was Russia invading it by force. The second phase was, for a period of—essentially, Ukraine getting stronger on the drone side and Russia getting its act together with respect to its tactics. The third phase was Russia actually pushing Ukraine back. Ukraine has recently—until recently—been on a defense side and Russia on the offensive side. As of this week, they're much more balanced. There's an assault that is just beginning now. It's a new one from Russia. It's called the spring offensive. It's around Pokrovsk, I've been there many times, and we'll see. Good weather favors the drones, because the drones operate best when you have higher ceilings, and the Ukraine numbers in drones—their goal for the year is to build 10 million drones. Let's just

think about that number, the vast majority of which are what are called FPV drones. They're not very sophisticated, but they're also using—

Rick Newman 02:13

FPV is first person—?

Eric Schmidt 02:14

First person view. It's an old racing term for drones. But the most interesting thing that they're doing is they're building much more sophisticated, integrated systems. So, one way to understand the war in Ukraine started with no air force and no navy. They've managed to destroy the Russian Navy in the Black Sea through these drone boats that you and I have talked about before, and they've essentially replaced the lack of an Air Force by drones. And they have a concept called—that they call the concept of a drone line, which I think is sort of where we'll end up this year, architecturally, where there's high-level ISR drones. So those are called—

Rick Newman 02:51

ISR is intelligence surveillance reconnaissance.

Eric Schmidt 02:53

And they basically are big birds with lots of endurance. They spend 12 hours floating around. They have very, very good cameras, and they're very well connected to bomber drones that then do whatever is needed. The automation of that is the next phase of the war, and I think that all of that will occur this year. Some of the lessons, and I'll just summarize, because we don't have very much time. I did not understand how important radio stuff was—it turns out that for many, many reasons, you have to communicate with these devices, and you have to have visual confirmation. I figured that if you build drones— and this is my advice—just build drones that can seek the target using AI and hit them, that would be good enough. It isn't. Partly because humans want to see what they're doing, for obvious reasons. More importantly, because the distances are involved, the targets move. And so a human wants to move, move to where the target is. The targeting is not perfect. But the most interesting thing is that Ukraine has a point system around reward systems for start-ups and so forth, and they compete on a point system where they have to show proof of kill. So for all of those reasons, the radio systems are the most important when you start the war. Remember, there's no GPS, and the Russians have the best electronic warfare in the world. They block everything. So a number of companies have figured out a way to use spread spectrum techniques and something called LoRa to build networks that allow you to see even through the Russian EW. Most American weapons don't make it through the GPS-denied EW, and that's a shame. The successful companies in the war are on a 24/7 basis. They are doing something during the day and evening. They're reprogramming all the software. It's like a software company—but just unfortunately, war is terrible, in an actual war—but they work on a daily release cycle. As you know, the Pentagon procurement is a 10-year release cycle. So the gap is enormous.

What I want to say is that—for those of you who think that Ukraine is losing—it's not true. A fair statement right now is that Russia is not winning and Ukraine is not losing. Now, this can change very, very quickly, and they are critically dependent on the Patriot missile systems for missile defense. One of the things that Ukraine doesn't have is very good anti-missile defense. I'm talking about ballistic missiles. So last week, for example, 49 ballistic missiles—of which four came out of, assuming 49 cruise missiles and 11 ballistic missiles, four of which came from North Korea manufacturer—were landed on Kyiv, and there were roughly 20 or 30 people killed, a whole bunch of apartment complex blown up. Now, just imagine, just put yourself in the mindset of this occurring in LA. I mean, it's very hard to understand what that would do to your own psyche. But this is normal for them, and it's horrific.

Rick Newman 05:46

At the same time, Russia is in the same arms race, or drones race, if you can put it that way. I mean, they are there—these two countries are, like, going head to head. Who can build the most drones? At the moment, since this change—I know this changes constantly—but at the moment, how do you get an edge in the drone war?

Eric Schmidt 06:04

Well, so it's interesting that I had, like most people, I had underestimated the Russian's ability to get their act together, because they start off quite incompetent, but they have actually built what you would imagine a military would build. They have taken the design called the Shahed-136 out of Iran, and they've now built it.

Rick Newman 06:22

That's like a big dumb drone—

Eric Schmidt 06:24

It's a very big dumb drone, but dumb drones kill you, too. And many of the deaths—the majority of the deaths—are occurring on the front line with essentially FPV and Mavic 3s. They have pioneered something called a glide bomb, which is particularly bad. It's a 1,000 to 3,000 kilogram bomb that is launched from an Su-34. In their airspace system in Ukraine, you can see the Su-34 launch the KAB, and your heart sinks because you know that we can see it, but there's no defense against it. And the reason you can't—there's no defense of it—is no thermal signature. You can't seek it. They're controlled by a set of drones called Orlan-30s, and people are now learning how to hit them. So, part of the solution with dumb bombs is you need to attack the control systems that control them. And Ukrainians have begun to figure that out. They started off—literally—by using 50 caliber machine guns to shoot them down. They're getting much better now at using FPVs to intercept those drones. And this brings in the next stage of the war, which is drone, anti-drone. So fast forward to a year from now, and my own view is that the war is going to continue for a long time. Unfortunately, it's horrific. Last time I was there, I arrived at the same time the ICU train arrived, because you have to go around by trains—visit the ICU train, and you'll understand war. So the

next thing—so let's imagine that you and I are opponents, which we're not, and let's assume that we're actually fighting, which we're not, and that—

Rick Newman 07:50

You would win. [laughter]

Eric Schmidt 07:51

No, no. You're smart and I'm smart. You have a million drones and I have a million drones. You're on your side. I'm on my side. Your drones vary in capability, and mine do too. No human can plan a battle to either attack or defend against your attack without AI—in particular, reinforcement learning. So when I look at it as a computer scientist, I see this as the end state is RL—reinforcement learning, planning, simultaneous defense and attacks on both sides—which optimize for outcomes. My own view—which may be naive—is that the average human, when they're faced that—when you and I were in such a situation, we would be so scared of what would happen, because the outcomes are so unpredictable that it would serve as a deterrent for you and I to fight each other.

Rick Newman 08:44

So you're getting to something. I covered the Pentagon in the 1990s and I learned about the OODA Loop. For, if anybody knows that, observe, orient, decide, act. That is what we're talking about here. Is trying to shrink the the so called OODA Loop, right? So you can see it and then react faster than the other guy using AI?

Eric Schmidt 09:02

Yeah, so that the US military is organized around the OODA Loop, which is conveniently organized around human decision time. And most of the OODA Loop work is three to five minutes. You know, you have time to think about it. You see it coming. You can sort of have a conversation. You can ask your commander, and then you can press the button. What is called the sensor-to-shooter time is being reduced to a small number of seconds. The current rule in Ukraine is, if you see a drone above you, you are dead in three minutes. I used to go to the front. I was bombed twice, which is never pleasant. Today, I can't go anywhere near it, because the moment the drones see me, they will do it. Furthermore, the Russians have now moved their drones to well over Ukraine territory, and the Ukrainians have moved their drones well over Russian territory. So the FLOT, as it's called, is actually is the front line, which is the line—

Rick Newman 09:09

Yep. Forward line of troops.

Eric Schmidt 09:58

That's right, the actual DMZ, if you will, is roughly 10 kilometers. But the space is now behind them. The so-called "safe" parts are now much wider. So what happens in the war is that distance becomes important. Your drone has to go farther. You have to have better sensors and so forth. Here's the eventual state: For thousands of years, we had the notion of, stereotypically, a man and a gun fighting another man and a gun, or with a horse or what have you. We're now breaking that connection forever, because the war will be prosecuted over the internet in one form or another, and in the equivalent of Moscow and Kyiv, people will be drinking coffee while these wars are prosecuted, and the actual fight will occur above these things, which are essentially robotic. This means, for example, that having a fighter jet with a human in it makes absolutely no sense. So all of a sudden, the logic of everything that we in our military do just doesn't make any sense, right? You should be building attritable automate, automated robotic systems for defense and offense. So would you describe Ukraine as, like, the most advanced laboratory for modern warfare in the world? Yeah, and one of the things that I've learned about war—so I spent lots of time at the Pentagon, as I mentioned, you did as well. I was there for, what, nine years? Top secret clearance, all that. We would do all these war games. They're very civil—like, oh, you know, let's think about this—that's not how real war works. Real war—the innovation cycle, is three to six weeks. So the general rule in Ukraine is that if there's a Ukrainian innovation, it's adopted by the Russians within six weeks. Good example is the Russians had the old model, the old Stalinist model of attack waves, and Ukraine was doing a very good job of attacking them. Russia would put these horrible situations where they'd have convicts and the Wagner Group. They had a group called the "bio-waste group," who were people who were infected with HIV or Hep A, and they would put them on the front lines with no protection because they were expected to die. I mean, the level of cruelty is mind-boggling. So that model didn't work, and so Russia recently switched to rifle teams, which are much harder to detect, and the people building drones in Ukraine is very interesting. I had always assumed that wars were tanks, right? Nobody uses tanks anymore. They're completely unsafe. A \$5,000 drone can destroy a \$5 million tank. By the way, the US tanks cost \$30 million—we'll ignore that. So the kill ratio, as they'd describe it, is a thousand to one or higher. So it makes perfect sense, if you think about it, that you wouldn't—In fact, they don't use tanks or armed personnel carriers at all, except for one time every 12 hours, which is there's a very short window of 10 minutes between basically sunshine and darkness, where the thermal cameras aren't good enough and the visual cameras aren't good enough. So what they—I'm serious—they rush during that very short window to shuttle somebody inside or outside of the tunnels. The people in the tunnel spend four days. That's the normal assignment. They have to be fed, of course, and they're terrified because the enemy—in this case, the Russians—know, know where they are, and so they're destroying them with FAB bombs. So you sit there in your tunnel—boom! boom!—waiting for yourself to die. So it's just miserable. So the future, in terms of conflict, is essentially the people are not going to be there, but the weapons will be very, very successful. I was speaking to one senior Pentagon person who said that one of the things they figured out is that the mass problem is going to get big. I said, "What is the mass problem?" And he said, "The mass problem is there's going to be so much weaponry above you. Right? Literally, kilograms of bad things that it's sort of destabilizing in terms of deterrence.

Rick Newman 14:04

That's amazing about the tanks and the armored personnel carriers, because it was, like, less than two years ago that it was such a big deal. It was so difficult just to get them Abrams tanks and Bradley APCs.

Eric Schmidt 14:17

We have 5,000 Abrams tanks, I believe, in Germany, sitting in warehouses? Give them to someone else.

Rick Newman 14:24

[Laughs.] Okay—

Eric Schmidt 14:24

I'm serious that we just don't need them. And if you look at the current budget proposal, the president and the Pentagon are buying more of all the things that they don't need. What they should do—just being very blunt—is study this war. And then America needs to dominate this future, right? This, you know—as you and I have talked about—I've written a lot about the innovation agenda. America is good at innovation. Why are we not innovating into this space?

Rick Newman 14:50

Okay so in last October, in Foreign Affairs, you wrote an article with Mark Milley, former chairman of the Joint Chiefs, "America Isn't Ready for the Wars of the Future—and They're Already Here." That would be the war in Ukraine, among others, I'm sure. Well, we've got five minutes, Eric, you can tell us how to fix the US military. [laughs]

Eric Schmidt 15:11

I was talking to one president of the United States, and I said, "I don't understand why you can't fix this."

Rick Newman 15:16

Can you say which one?

Eric Schmidt 15:17

No. And he said, "No one can." We've organized our military into a—first, the humans are great, but it's run like a bad 1980s corporation. It doesn't have a coherent goal. It has 435 board members with specialist interest. It's not

possible to cancel anything, so forth and so on. From my perspective, the Pentagon does not think the way software people think, because they don't know how to hire them. They get rid of them. Whenever they hire software people, the accounting people can't figure out what they do because software people can't figure out what they're doing, and so they eliminate them. So it's just a bad culture with respect to how they do procurement. The typical new weapon cycle is about 16 years, and that's from start to finish. Now, do you think that we can accurately predict the weapons that we're going to need in 16 years from today, given the level of innovation that I'm describing? Of course we can. So there are technology approaches within the Pentagon. One are called using OTAs, and there's special authority—

Rick Newman 16:20

What's OTA?

Eric Schmidt 16:21

It's essentially a different kind of authorization to buy outside the procurement process. But the procurement process is now dominated in the following: there's a two-year process of studying, then there's a two-year process of writing an award. Then there's a two-year process of developing the award, selecting to one vendor. That one vendor then develops for three to four years. After that, they deliver the product, during which time they're held up for a year or two by challenges between the different primes who sue each other all the time. This is not a good recipe for innovation, right? There's—the good news is, in America, you've now seen an enormous number of start-ups, and they are innovating in the space that I'm describing. They're incredibly good. We have one right here. You'll hear him in, actually, a whole bunch— But I certainly know about one of them. I've worked with them a bit, and their problem is that the customer is not ready. Because the customer says, that's great, but the start-up is moving at start-up speed, and the government is moving at start-up speed. Now, thank God we're not at a war. I was talking to one of my favorite general friends, and he said, "Don't worry, Eric. If it's a real war, all the rules go away and you can get anything you want."

Rick Newman 17:06

Great. That's who's coming next. Do you see any area within the Pentagon? I mean, it's not literally monolithic. The Marines, for example, the Marine Corps is, you could argue, somewhat more innovative—less tied to big weapons platforms. Are there any small hubs of innovation that are happening faster?

Eric Schmidt 17:53

Relative to the innovation that is needed and the kind that you see in Silicon Valley, there's no one in the hunt. There are very small teams in the various militaries that try really hard. There have been special—something called AFWERX, and so forth. Each of the services has them, but they're not spending very much of their time or emphasis on it, because the incentives do not reward this kind of innovation. And you know, to me, it looks like

business as usual, and I'll give you a simple rule. Do you really think that we're going to defend Taiwan with all of our aircraft carriers? Let me remind you that we have no particularly good defenses against hypersonic missiles. Nobody has. It's a very hard problem. And those aircraft carriers used to be hard to find, but now they're easy to find because everybody has these LEO constellations for surveillance. Do you really think that China is not going to take a land-to-sea approach and get rid of your missiles? So, imagine the aircraft carrier, that it basically says, well, in 30 seconds, you're going to be dead. Press the button. So the person says—talks to the boss, and says—I'm pressing the button, they press the button, but there's no effective defense against these kind of weapons. A simple solution—which, again, I don't know that we're pursuing—is, instead of doing that, build basically things, as you see with the Maduro boats in Ukraine, where they're on the water, but they can sink even a few feet below the water, and then serve as the equivalent of torpedoes. Now, what I would do—right?—is build those things and think about—I mean, I don't run a company in this space, but I would build those boats, get the military to purchase them, and then stage them such that it would not allow for a land invasion by China of Taiwan. Take away one of their options. It's easy, because, you know, they are called RORO boats. And the way you—sorry, RORO: roll on, roll off—and you basically go from China to about 100... China, Taiwan is about 100 miles, right? You stop that interdiction. You stop the alleged or future embargo of the fuel and energy sources of Taiwan. So the point is, when you start thinking my way, you just come up with completely different platforms. And we as a nation are not doing that. And I'm a strong advocate—again, working with Silicon Valley, working with the companies you're going to hear about next, right? To see that future. It's how we're going to stay safe. There's plenty of money for national security in America, which is great, right? It needs to go there.

Rick Newman 20:27

I wish we could listen to Ukraine stories and more of this. We're out of time. But thank you. That was fascinating, and you can look that article up at Foreign Affairs last October. Eric Schmidt, Mark Milley.

Eric Schmidt 20:37

Thank you. Thank you so much, Rick. Okay. Thank you all.

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