

In the fight: Scaling AI/ML in defense with Colin Carroll

[00:00:36] **Eric Lofgren:** I'm speaking with Colin Carroll. He is the Director of Government Relations at Applied Intuition, which enables autonomous vehicles through simulation development and validation. Before that, Colin had a number of positions including Chief Operating Officer at the Joint Artificial Intelligence Center, mission Integration Lead for Project Maven, and 10 years of operational experience in the Marine Corps.

[00:00:58] Colin, thanks for joining me on Acquisition Talk.

[00:01:00] **Colin Carroll:** Yeah, Eric, thanks for having me here.

[00:01:02] **Eric Lofgren:** It's good to be with you here in beautiful Rosalind. So can you introduce us to how your military career started to intersect with the world of artificial intelligence?

[00:01:11] **Colin Carroll:** easy. So a couple things to know about me first I'm an engineer by background, so I studied aerospace engineering at the Naval Academy, and then I was a autonomous systems engineer at Johns Hopkins Appli Physics Lab.

[00:01:24] Second, I'm a war fighter, so spent a lot of time active duty in the Marine Corps, still in the Marine Corps Reserve. In the Marine innovation Unit. And then third I'm an eternal optimist who tries to build capability and deliver it to the war fighter. My story about how I joined Project Maven back in 2017 by the

[00:01:43] **Eric Lofgren:** way, when did Project Maven, officially get kicked off?

[00:01:46] **Colin Carroll:** Yeah, Bob Work approved project may have been the algorithmic warfare cross-functional team in May, 2017. So you were one of the initial I joined in June. Yeah. When I joined the team, it was an active duty Marine Colonel Drew Cukor, a few marine reservists, and then myself. So it was a team of marine reservists.

[00:02:06] Let's see, but why Marines Was there a reason? I think Drew Cukor was just mostly familiar with and comfortable with Marines and he brought a team of people he'd worked with in the past. To try and get going quickly. So hand selected team,

[00:02:18] **Eric Lofgren:** you don't, it's that's like the RCO kind of model, huh?

[00:02:21] **Colin Carroll:** I think he knew.

[00:02:22] I think, yeah, it's very similar. I think he knew who in his past life he had abused and who could put up with it for 20 hour days for seven days a week, and he brought those people on the team. So for me in particular, I'm an intelligence officer. I did five years active duty in the Marine Corps and then I did five years doing some other work for the joint force.

[00:02:40] I'd worked with Drew Cukor previously, and he called me in May, 2017, right after Bob work had approved the a, the AW C F T or what became Project Maven. Then he said, Hey Colin, can you come be my counterintelligence officer? I'd done a little bit of time in the Pacific working deception against China and he's Hey, we need a deception plan here for our AI program.

[00:03:03] And I got there on day one and what I realized was he had a. Like a one page sheet of paper signed by Bob work and 10 PowerPoint slides. And that was Project Maven. And I, what I really quickly realized was what he needed was a systems engineer to run the development process.

[00:03:17] So I'd signed up for six month orders and wound up being there for two and a half years doing something completely different.

[00:03:22] **Eric Lofgren:** One of the things that, I found out about you that was pretty cool is that you made it to a senior executive service in the government at the ripe young age of 31

[00:03:31] So can you just talk about, what'd you learn in that experience at such a

[00:03:34] **Colin Carroll:** young age? Yeah. I was a government civilian and a federal civilian for a while prior to coming to Project Maven. So that's something people don't really know about me. I was in the Department of the Navy.

[00:03:46] When I joined Maven, I actually joined as a reservist, but I was still a, technically a federal civilian. I didn't actually become an SES. I became what's called an HQ e a high quality expert. So it's very similar to an SES. It's the same rank, but it's a non-com competed hire. And there's a whole set of rules that go with it, and there's HQs allocated to different parts of the department.

[00:04:06] I personally think that HQ should be allocated to more parts of the department down at the service level example for a peo, which they're not right now. Right now the HQ builds are all held up at OSD or at the service headquarters. So an HQ e basically means you've got some kind of technical background, typically technical in industry or somewhere else, and you're bringing something to the department that that they typically can't find, when they just hire out on USA jobs.

[00:04:32] So my kind of view on life is I'm out here in industry now at applied tuition, and that wasn't that wasn't my choice. I was actually fired from the Department of Defense about a year ago. Let's take a pause real quick. Okay. So this past weekend I went for a run here in Rosalind, and you mentioned that you run, so we ran down the trail outta Rosalind and we went down to the Teddy Roosevelt Island.

[00:04:57] I lived here my whole life and I've run around that island, I don't even know, 500 times in my life. I've never actually stopped at the memorial. And so my wife, Kaia she was born and raised in Ukraine, so she's never been to the island. She's Hey, let's go check out Memorial. So we ran over to the memorial and there's a great quote there.

[00:05:13] It's something that we memorize freshman year at the Naval Academy called The Man in the Arena. It's a Teddy Roosevelt quote, and. Basically it says, the credit goes to the person who's actually in the fight, day on trying to get stuff done. I've kinda lived my whole life like that. And you can define the arena differently in this case.

[00:05:32] I, I typically define the arena as like in the Pentagon, actively trying to make a difference. I'm not there now. I'm in industry now trying to make a difference from the outside. And everybody defines their arena differently depending on the ecosystem that you're in. So my words of advice to anybody who's trying to join the government is it's daunting.

[00:05:50] There's a lot broken. It's very hard to fix some of the things that are broken. However, there are opportunities, things like Project Maven where we can use new and interesting authorities use top cover from some senior DOD

officials and leaders to actually move really quickly and build something and deliver to the war fighter.

[00:06:08] So that's my goal in life. And someday I'll be back in the dod.

[00:06:12] **Eric Lofgren:** maybe let me just poke on that a little bit. What's your definition of being in the fight then? Because I spent a number of years in the Pentagon, but I wouldn't have necessarily felt myself like I was in the fight. I was, collecting data reports from contractors and you feel pretty separated from the mission cuz your mission feels like the process when you're in the building sometimes.

[00:06:33] And maybe that's just, my perspective coming from where I came from, but how would you think about like who's in the fight and who's not in the fight? .

[00:06:41] **Colin Carroll:** Yeah. I think that everybody in that building is in the fight.

[00:06:44] To be quite honest, I work at Applied Intuition.

[00:06:47] I think about applied intuition day on stay on every day and how to grow the business here. And, the fight that we're in is slightly different from the flight of being in the Pentagon. But at the end of the day, I think my heart and passion are still back in the building. Because at the end of the day, no matter how hard we try here at Applied Intuition, no matter how many great ideas we have and the great capability that we build, if on the other end of that is a program manager that has no idea how to build a program or deliver capability or is in that process even if they want to do a good job, they're just stuck in the POM cycle and PPBE process, it doesn't really matter.

[00:07:22] I do think that the fight at the end of the day is in the building and it's how do we. How do we, the royal we ensure that the right people are in the right positions there to break through some of the log jams that pop up. My advice to, younger people trying to get into government is definitely go for it.

[00:07:39] It can't be disheartening, it can't be frustrating. We were talking about it when you first came in, right? You were super frustrated there in, I guess I've been lucky in my career in the sense that I've gone to organizations where the people really cared and the people were okay with going to their sugar daddies, if you will, at the senior levels and ensuring that they had the top

cover to, I don't wanna say bend the rules, but be flexible with the rules and authorities in order to move really quickly.

[00:08:09] And that's even prior to Maven. I was in a different organization that, that was super flexible prior to Maven. Cukor, when he started Maven, he brought some of those same people in because he knew that they had that mindset. And it's the mindset of, hey the left and right lateral limits say this.

[00:08:25] However, the war fighter needs something now, so how can we get to Yes, in order to build something and deliver it to them? I think a lot of the cases where, I'm on the outside now looking in, we primarily do with the Department of the Army. There are some great PMs and PDMs in the Army.

[00:08:42] Product managers in the Army, I consider them unicorns there are super enlightened. They wanna move quickly. They've had different backgrounds than the kind of I've worked in Detroit Arsenal my entire life. Some of 'em came from darpa, some came from sco, and they're. Okay with industry suggesting them alternative pathways to acquire commercial technology.

[00:09:03] And then we look at the rest of the PDMs and PS, which is, Hey, I'm gonna do my, major program over a seven year timeline. I'm gonna put RFIs out the industry over three years and then do an award and then I'll get block upgrades for next 30 years, every five years. And all the war fighters hate what I deliver to them.

[00:09:23] And that's the dichotomy there is how do we educate more of the PMs to be like some of the unicorn enlightened PMs? And what we've seen is it takes one win from one person to then motivate or incentivize some of the other PMs and PDMs to say, Hey, I want to be like that guy.

[00:09:43] That guy got a lot of publicity and press. He did something unique and different. And I want my star too, or I wanna be an oh six two. And so they'll latch onto that pathway. So we'll see how this plays out over the next year or two.

[00:09:56] **Eric Lofgren:** So you think one of the complaints has always been no one gets rewarded for taking any risk, but just getting like an article and breaking defense or something like that, you think that's actually helping push the needle?

[00:10:06] Or have you seen people get rewarded in their career for making these moves? We just had a little conference last week and Bill the plant, the acquisition executive was there and he was like, look, none of no one was taking anything seriously until 2009. . Like the Pentagon and the acquisition folks weren't at war until someone lit a fire under the s with the m a and the rest of it. Do you see that kind of starting to come around today with the great power competition in the rest, I.

[00:10:34] **Colin Carroll:** I think that in order for people to recognize that we are at war on the whole, like the larger than, the 3% of people in the building that do get it will it need to be actually in conflict.

[00:10:45] So I don't think that we're in the 2009 moment yet where you have a sec depth that's basically breathing fire down on a service in the OSD staff to deliver something quickly against their entire, soul and being, which is how they always operate. I don't think we're at that point. From a incentivizing, PM's perspective when it comes to taking risks.

[00:11:05] I think it's at a personality and individual level at this point. So it depends on the organization, but when you're at the services at the ps 90% of the PMs and PDMs and PS just grew up in that system, right? If you're lucky, you got one that was out at a joint.

[00:11:19] r and d organization potentially learned something out of outside the normal acquisition's effort. Those people we tend to see take risks, and I'm not even talking like really big risks, but at the end of the day they're judged and promoted based on their ability to work within the system that they're in.

[00:11:36] So yeah, I don't see a lot of change coming anytime soon there.

[00:11:40] **Eric Lofgren:** Let's talk a little bit about acquisition approaches. So you were at Project Maven which you know, is a project with a defined kind of like output mission output, and then you're also at the joint Artificial Intelligence Center, which does a whole bunch of things.

[00:11:53] But can you talk a little bit about how was the acquisition approach to artificial intelligence and machine learning different at each of those organizations, if at all?

[00:12:02] **Colin Carroll:** . You have to go back to the charter for both of those organizations. So Maven, the algorithm, the warfare, cross-functional team. It

was literally designed to accelerate purely AI capability development for geospatial intelligence to war fighters.

[00:12:19] It didn't inherit a lot of the, I'll call it baggage, but a lot of the other task, something like the Jake inherited, which was how to train and educate a workforce AI policy to include international policy acquisitions policy. So Maven was able to stay very lean. It was mostly reservists with some details and then some contractors in the office.

[00:12:42] And the way that they operated was they gave all their money to industry to develop and field AI capability, and AI capability ranges from the data management, data acquisition all the way through, a platform in a war fighter's hands. That's more of a common operating picture on the Intel side.

[00:13:00] Jake. It took its money and hired 300 people. I think when I left the Jake, there were 300 people. I couldn't tell you what 200 of those people did. I didn't know them. They all worked under me somewhere, but I didn't know what they did. Now that's, some of that's probably c and just the nature of onboarding 150 people during covid.

[00:13:16] A lot of it's nature of what Congress and the department tasked the Jake to do. The Jake was not a capability development program. It did some capability development, and because the Jake was, it was such a wide spectrum of what it was supposed to deliver. When I joined the Jake, I think there was something like 30 capability moment projects, and it was all, a lot of it was what a detail E brought up from their service.

[00:13:40] I viewed the Jake as an organization with the giant Jay in front of it, which meant that we should be doing things that impacted the joint force and IPLs from the command commands and joint requirements. However, the people in the Jake mostly came from services were detailed there, and they brought like a hobby project with them from a service.

[00:13:57] So we spent a lot of time trying to undo some of that shrink from 30, 35 projects down to, less than 15, I think we got down to 13. The Jake for everyone out there, the Jake doesn't exist anymore. It's now the Chief Digital AI office. It's part of that organization. I believe that c d AO went even further and hacked down some of the projects.

[00:14:16] I would've loved to hack it down to five, but people got upset with me getting it down to 13. When you take someone's money away, they tend not to be happy about it. So yeah, I mean that, that's, those are the two major

differences, right? It's just two different responsibilities and what they're supposed to do.

[00:14:30] **Eric Lofgren:** And one of the things that we often heard from the Jake was their joint common foundations and laying the kind of like infrastructure, so to speak, for, the rest of the department. And they would actually, their projects, the ones that they did have, were really designed to be , pushed down back to the services and in coordination with the services.

[00:14:49] Can you just talk a little bit about at least that data aspect part. What were they doing there and where is the department today in terms of data?

[00:14:58] **Colin Carroll:** Yeah. How about this? Without even going into applications, which are relatively cheap and easy to develop, we have programs in the department. That are autonomy programs. I e the program office has a requirement to deliver some kind of unmanned capability, autonomous, semi-autonomous, this decade to a war fighter where they have zero data, zero data.

[00:15:22] They've not collected any data from any of the current, enduring or legacy systems that are out driving, flying, or sailing. No one spent money to do that. Where there are sensors on those vehicles. Either the data is dying on the vehicle, it's never actually coming off, or it's dying at some local training center somewhere.

[00:15:39] However, we're about to invest billions of dollars in procuring systems that are supposed to be autonomous. One of the things I always, I joke John Mark loves this I wanna put. PM or PDM who's responsible for an autonomy program on a school bus and drive them to Tesla and drop them off there for two months and have them observe how commercial industry sets up an autonomy development platform.

[00:16:04] Data is critical. Most of these programs spent years strapping sensors on Ford fusions and driving around collecting data before they even started development, or at least in parallel with the development. So that's one of the key things that I think I observe every single day. And in applied intuition, we're trying to enable some of these PMs to understand that this is really critical.

[00:16:26] They're not gonna get what they want by just pumping money out the industry. They need to actually design their program properly. When it comes to something like the C AO or Jake or Maven where it's more of like a software application, there's not a platform involved. I'm a fan of. Doing

iterative software development and getting it to a war fighter for feedback from the war fighter in parallel with your like development platform.

[00:16:49] , where I saw a lot of problems was the development platform just never happened, right? It was the shiny object. Get something to a war fighter without that other foundational piece being built in parallel. that's a bad thing. That's a fail when it comes to something like Maven.

[00:17:03] Maven is 257 million a year, R D T and E. A lot of that went to industry. Probably a hundred million of that was on the DevSecOps platform side. So data acquisition, data curation, data labeling. Maven had a team of 400 data labelers annually, eight hour shifts, just labeling geo and data from all different platforms, all different sensors, unclassified, classified There's no other program in the department that's even remotely looking like that, and it's because they either don't know, or they've got a limited budget and they're on the hook to deliver 12 prototype tanks or 12 prototype airplanes.

[00:17:41] And so that's where the money's going. We know how to do that really well. The program officers that are supposed to deliver those things know how to do that really well. What they don't understand is how to build software, sustain software for the life cycle of a program. They don't understand, Hey, I need to be able to build this enterprise foundational platform that's continually iterating on and delivering software to my weapon system.

[00:18:01] To me, looking at it now, , a lot of these individual programs are trying to build. There's not an enterprise. Look at like the army level or even at a P level to say, Hey, we're gonna take money from some programs and invest in an enterprise system here that's going to, that's gonna deliver this software capability for 30 years.

[00:18:22] It's just not, it's like the tragedy of the commons. Nobody wants to take their money and invest in something that might benefit the guy next to them or the guy next to them, or God forbid, another p that's for, hallways down in the same building. It's just the nature of the beast that we're in,

[00:18:39] **Eric Lofgren:** well potentially, that type of data collection wasn't built into the, program requirements and program funding.

[00:18:46] And they'll just be like, I'm not funded, I'm not funded to do that. It sounds great, but, go find me another a hundred million dollars and then I'll be happy to go do it. Is that kind of what you hear or I, the Jake was supposed to, or the CDA AO now have their joint common foundations.

[00:19:01] Yeah. Is that too high of a level or why is that

[00:19:03] **Colin Carroll:** not solving it? Let's chat enterprise enterprise development. And then the current say of things. So yes, the Jake was supposed to deliver the jf. I have my personal opinions about the jf and all I'll say is the JCF [joint common foundations] is no more. I heard it this weekend.

[00:19:17] It is no more. There you go. Broke news. Oh, you heard it here First. broke news for you. JF is no more. They have a thing called the jcn, the joint cloud neutral. And we can talk about that separately. But the jf, the Deloitte prime contract is no longer refunded. The CDAs consolidated to a couple different development environments that the DOD spent a lot of money and resources on already.

[00:19:40] And so that absolutely makes sense to me. So there is. ai, enterprise capability Development. At this point, Maven spent a lot of money on professionalizing a network called sunnet, secure and Classified Network that's owned by asd, solic, what I mean, a lot of money. They put a lot of GPUs in. This is a hybrid cloud, OnPrem and Ashburn plus, gcp, aws, Azure, probably 150 million.

[00:20:04] Went into that network to professionalize it for imagery, computer vision, neural net processing. Mavens biggest failure was creating a massive labeled data set. I think the numbers of labeled frames are cui, but it's in the a hundred million plus. But not providing that to the rest of the department as a, as an enterprise resource or even enabling the department to onboard to it so that they could use the data.

[00:20:31] And there's a whole host of personality reasons why that happened and why it went like that. Where we, where I see the future is R e U s D R E. They've, they were approved from Cape actually to start what they're calling AI hubs, which are basically enterprise AI development environments by technology areas.

[00:20:49] So one for computer vision, one for natural engine processing, one for robotics process automation. And their charter is to, I dunno if they're gonna bring data to a centralized data location if they're just going to enable data access across a number of different data environments.

[00:21:05] And then enable research engineering to come in, so your AC academic urs, the service labs to access large quantities of, compiled. Starting in 2023, we'll see how this goes going forward. It's a bit of money. It's not a lot of

money, so we'll see. But right now these don't exist. And honestly, if I was a pm I would say there's a lot of risk in relying on these things that may or may not exist.

[00:21:31] My service is telling me I can't use something like Adva, which is a joint network or summit, which is a joint network. I need to use Platform one of from the Air Force or COEs or Sea Army. If I'm in the Army or Black Pearl, I'm the Navy. All of these environments are years behind and hundreds of millions of dollars behind in some cases what the department's already invested in.

[00:21:50] So they're kind of stuck. We're doing a kickoff this week with the Army. It's out of d IU and then the robotics combat vehicle. They've been told, Hey, you must use an Army network for development. We've talked to the Army networks and. I will spend my time and effort and money to enable these army networks to grow in the next six months to 12 months.

[00:22:11] But the reality is the right answer for the department is me making a phone call and introducing them to Platform one or to Sunnet where the money's already been invested. We could start doing work in, in, four weeks. But there's service politics involved, and I'm over here in industry just saying, you point me in the right direction.

[00:22:27] We're gonna, you're gonna pay me, I'm gonna do what you want me to do, whether it's the right thing for the department or not.

[00:22:32] **Eric Lofgren:** So it sounds like you have Matrix of approaches here. You have the data potentially starting to be centralized according to these verticals by the rne.

[00:22:41] Then you have like the development platforms and processes, which are dispersed through the services themselves. And then you also have the other applications and mission outcomes that will ride on top of those. Does that sound about right? That's like the,

[00:22:54] **Colin Carroll:** the ecosystem.

[00:22:55] I think that's the theory. I think it'll be interesting to see, r e by its nature defaults back to research. And if you look at who's in rna, it's researchers. And so there's nothing against researchers, but they're not, Hey, I'm gonna build production software. So I think at the end of the day if we assume that there, there will be a conflict this decade or even, relatively sooner this decade.

[00:23:17] then basically we're fighting with systems that we have today. They're not really gonna change. There might be some changes, but on the whole, it's gonna be hardware that we have today. So how can we then enable rapid software updates to that hardware? And that's gonna be a PM thing. They're the people that are closest to the fight.

[00:23:34] They have the requirements from the war fighter to procure and deliver. Right now, everything else, I think is ethereal and maybe we'll deliver something. Maybe we won't deliver something, but I wouldn't be relying on it if I was a pm.

[00:23:45] **Eric Lofgren:** You talked a lot about the data that needs to be labeled and then actually is it owned by the government?

[00:23:51] And this is one of my questions here, because we've been hearing a lot about, government moving towards these government controlled baselines for autonomy in all the services. You mentioned the robotic combat vehicle and the. They have their own autonomy core system, sky board in the Air Force, the unmanned efforts in the Navy.

[00:24:07] They have their autonomy baseline manager. are they also controlling all the data inside government own data as well? That feeds all that stuff? Or what's going on with that government controlling of this baseline for the autonomy and what's your view there?

[00:24:22] **Colin Carroll:** I have views on the three efforts and how they're setting up.

[00:24:27] But I'll start by this, which is you just asked me about is the government controlling data. And my question to you, Eric, is what data? You're making a huge assumption that those programs are acquiring and labeling data and even recognize that's a problem From my observation, both in the government a year ago and then the last year here in industry is that nobody is thinking that.

[00:24:49] **Eric Lofgren:** Does the industry have any data

[00:24:51] **Colin Carroll:** on this? So most of the DODs data is out in industry and it's owned by, whoever's the current kind of incumbents are on some of these contracts. I think the interesting thing is if you're doing a bake off between, let's say take Sky board, you've got four different vendors making air platforms.

[00:25:06] I think they've narrowed it down to one or two Skyborg is dead, but there's follow on of Skyborg out of afri on the whole, when those companies flew their prototype vehicle, one, they're collecting very little limited data. That thing might fly once a month for a couple days. And then two, any data that was collected is at each disparate vendor.

[00:25:25] And that's just how the contracts were written and their proprietary data. Yeah, if the vendor collected it, they own it. Yep. There are some instances probably where something's flying at a red flag or something like that. And maybe the data's being collected. I look at like, where is the aerial data now?

[00:25:39] Maven has a lot of it. Coming off of, combat weapon systems that were deployed in Afghanistan, Syria, Iraq, Somalia, places like that. And

[00:25:47] **Eric Lofgren:** that, that's government owned. Like they just paid contractors to help label and manage it, but they, that's their data.

[00:25:52] **Colin Carroll:** Yeah. I'll putting my government hat on, Maven did it right.

[00:25:57] So there's a couple reasons to acquire and manage government data on a government network. The biggest reason is so that industry can't take it and sell it back to the next guy down the hall, which is what industry loves to do. I have numerous examples of one company that will go unnamed selling basically selling the exact same AI computer vision models to pack fleet office of Naval Research seventh Fleet.

[00:26:24] And everyone's paying a lot of money for a commercial model. That the government's basically handing data to this company and that are selling the result back. That's insane to me. What Maven did was they set up a government environment. They set up government labelers, and then they enabled commercial industry to come into that environment and train models.

[00:26:40] I don't really see that happening anywhere else. And to be quite frank, like when we talk to some of the programs, they don't even understand that at all. They're just like, I wanna give money to industry. They're gonna give me back a plane with a model on it. They don't care how it, how the model got built or developed and what the end result from that.

[00:26:58] Another program that will go unnamed is that industry will deliver a model based on requirements from the government. So an AI model where the

government doesn't really understand test evaluation, so how do I ensure that this model works or not? And so they get back a model that's. Performs in a very limited environment because of how the government issued its test and evaluation metrics.

[00:27:23] Now, if you took that thing out of its very limited environment at Edwards Air Force Base, for example, and had it fly anywhere else on the planet against, any environment where you have trucks and school buses and people walking around in rocks and trees, it would never perform. But because it was X range Edwards Air Force base where you have only ground order battle Soviet systems out there, hey, it works 80% of the time, which is what we needed to have it do.

[00:27:47] And there's no way for the government to then say, okay, now we're out in this new operational design domain. I need to work with rocks and school buses for that vendor to then say, oh, I have the whole platform. You can, I start feeding data in labeling it development model. Like they didn't do any of that work either.

[00:28:03] That doesn't exist at their end. So there's no, you know, bae or Raytheon or General Dynamics that's set up a software development foundry like, like Elon did at Tesla. It doesn't exist.

[00:28:13] **Eric Lofgren:** Since you both have the government and the kind of industry view here, we often hear from industry, right?

[00:28:19] That intellectual property is their lifeblood, but if the government, let's just say they adopt the Maven model they have the autonomy core system, they're supposed to be like, Hey, I can swap in and out vendors. And that keeps competition alive, obviously. So how do you see that working?

[00:28:34] Does that business model work for industry as well? If they are just like, you give me the data, I'm just doing my, this part of the value stream here in terms of creating the model and delivering it back to you. They're not gonna be able to capture more of the value stream and be able to, have that kind of mote.

[00:28:52] Potentially against others who might be all running from the same kind of kernel if you will. What's your view on like this dichotomy of who owns the IP rights and the data rights and where that sits?

[00:29:05] **Colin Carroll:** All right. My view on data rights here in industry. When, we talk to staffers or we talk to senior acquisitions executives in the department here and everybody says what about competition? How's the competition? I joke that our biggest competition for the last year has been the Department of the Army.

[00:29:24] My commercial software competing against GOTS software that's built by, GS 12 s in Detroit, or their kind of c a contractor contract equivalents. And it's different. It depends what you want as a program office. If you want something that's had hundreds of millions of dollars of investment on the commercial side, plus thousands of reps and exists now then you'll accept the risk and say, Hey, I'm willing to do a commercial license and bring this into my program.

[00:29:48] On the r and d. So we see, honestly, a year ago I used to joke and say it's gonna be really difficult to sell into the Department of the Army cuz of things like robotics technology kernel. What we've seen in the last year though is a drastic shift from the program offices that are required to deliver real capability.

[00:30:04] So production software on 3000 vehicles by 2028 to be very open to commercial software and commercial licenses. Then it's this isn't, it'll probably trend in the news here as we go over the next six months because the program offices aren't coming right out and saying this is what we're doing.

[00:30:22] But what you're seeing is a twofold kind of response. One is, I'm not sure I trust the r and d capability that my service or, the joint forces has been doing for the last five years. It's very non-production, very researchy. And also, I'm not sure I trust the big hardware OEMs to deliver software.

[00:30:40] the Army in particular has a couple programs with requirements for autonomy or AI that are doing a separate hardware acquisition pathway and a separate software acquisition pathway. And so I'm super interested to see how this plays out. I think that there's a lot of value in bringing commercial companies who've invested a lot of venture capital in getting to the point that they are at where the army maybe has not done that.

[00:31:07] I think that the big risk is going to be a couple years from now you've got a big hardware OEM that's on the hook to make air vehicle or a ground vehicle. And then you've got traditional or non-traditional software companies, some kind of mix there, maybe a systems integrator. And now you have to merge those things together.

[00:31:25] And on the whole. Most of these hardware platform providers are not super accustomed to, or probably willing to willingly integrate someone else's software into their vehicle. And the government then becomes the systems integrator and the people that have designed these programs will all be, have moved on two years from now.

[00:31:46] So you'll have somebody else in the seat as the PBM or P or pm. So I'm not sure how that's gonna play out. It's gonna be an interesting experiment. I'm cautiously optimistic though.

[00:31:55] **Eric Lofgren:** I guess in your philosophical view of acquisition, , does it make sense breaking some of these pieces out and having government, whether it's with Asita or otherwise, help put those pieces back together, or, because we've heard calve from the Space Force, he just recently said, Government should never be doing that, at least in his view, in his service.

[00:32:16] So that lends it more itself more to I'm just gonna, outsource this whole thing to Lockheed Martin and hope that the non-traditionals can work through that prime somehow. And, so how do you see

[00:32:25] **Colin Carroll:** that? Yeah, it depends how you see risk. The ability for the government to act as a SI comes down to having the right person.

[00:32:34] And on the whole, most of the people are probably not the right people. There are some organizations where that's not the case. A place like Strategic Capabilities office, however, the selection process to become a PM there is very different from a service where it's just I'm an acquisitions officer, I got trained, I, do communications for a living, but now I'm running a major ground vehicle program.

[00:32:56] Why? Because that's the pipeline. That was the open spot I got sent there. I'm here for a couple years and then I leave. So I do think it comes down to the ability of the person. I think from an acquisition's perspective I've got my whiteboard here, but no one can see it, but I could drop on the whiteboard.

[00:33:12] My, my kind of view of acquisitions as a spectrum. One end of the spectrum is just hand the problem to Lockheed or Boeing or General Dynamics. And the other end of the spectrum is a software company primes NextGen Tank. I don't think either of those are the right answer.

[00:33:28] I think a really interesting example of a software company primes a hardware program is like Microsoft with IVAs. And I think on the whole, I

don't, I'm not fully read into that, I've never seen the IVAs, but like on the whole, I think most people would say probably not the biggest success in the middle you have.

[00:33:45] This software pathway, hardware pathway split where software companies make software and hardware companies make hardware and then someone's gonna integrate that at the end. And I don't know what that looks like. Maybe it's a subbing the software to the hardware, maybe it's the government acts as an si, maybe it's a software systems center comes in and both sub to that.

[00:34:02] I'm not sure how they're gonna do that over the years. I think the interesting thing is like the spectrum between a software company primes a major program and the split, which is, are there certain companies that exist now that are probably nontraditional, that make hardware and software, but do their development in a very agile manner.

[00:34:26] So even the hardware that they're making and the kind of mindset that they bring to the problem is very rapid and iterative. And I think, the SHARPE companies or Hill called that, like they tend to fit in this mold here. So I think it would be super interesting to see, one of those companies potentially priming a major hardware program.

[00:34:45] I think we'll probably see that in the next five years and that'll be another experiment is can they do it ? It takes a long time to be able to make a manned aircraft or a manned ground vehicle. I think on the unmanned side, maybe some of the safety requirements are a little bit less and there's things that you could get away with there that you couldn't get away with on the Mann's side.

[00:35:02] So I don't know. Have to see.

[00:35:04] **Eric Lofgren:** Yeah, the hardware software integration is an issue. I. From your perspective, does like the army with the robotic combat vehicle, for example, is that easier to split apart because, there's like more standard drive trains and a lot of like ground vehicle data in the commercial sector.

[00:35:22] Versus if you do it for, sky Board or Navy where there's potentially less of that going on already because like the commercial market's not all in on, on a combat UAV that can go close to mock one. So that data doesn't exist. So does one, does it, does the state of commercial sector and those kind of interfaces, have a,

[00:35:42] **Colin Carroll:** yeah, I think on the ground vehicle side you'll see more traditional commercial software companies in that space.

[00:35:50] And that's because a lot of venture capital and then obviously the on-road data collection, everything that goes there. Over the last decade has created some software companies that are very good at this and are interested in doing this. Similar problem in the d o d

[00:36:06] so there's not a lot of off-road ground vehicle data that exists on the ground side. On the air side, there actually is a lot of data. The government owns a lot of data. Why? Because MQ nine s MQ one s been flying for 25 years and their Intel assets, their ISR assets. So the Intel community has saved this data.

[00:36:22] This is what Maven spent a lot of time labeling. This is why Maven has so much labeled data. And honestly then the department has a lot of labeled data, and it's for camera, it's for radar, it's for eant payloads. There may not be as many commercial companies. That will be in that space. However, there are a lot of software companies, traditional defense software companies that are in that space.

[00:36:46] And so I think the split will still be there or still could be there between a software company and a air vehicle manufacturer. It just might not be some commercial automotive, software company that that had 400 million in VC investment. It might be something else.

[00:37:02] **Eric Lofgren:** I wanna talk about just like the size and scope of some of these AIML types of programs.

[00:37:08] I saw in a govin report that the DODs total ai, ml and autonomy programs were roughly 2 billion overall, and I believe Mavin, as you said, might be the largest of those efforts, over 200 million. Does that, first of all does that amount sound about right to you or where's

[00:37:25] **Colin Carroll:** the, a bar on that? Yeah, I remember this COVIN study.

[00:37:27] The Jake did a similar study with a MIR tool where the department volunteered what was an ai. Honestly, my guess is that the 2 billion is probably overestimating how much money is truly going into AI in the department. Really? Yeah, because AI's a buzzword. People put AI in their, Cape Slide or

their J Doc budget request, their J doc request because it, they think it's gonna get them money, then probably they're right.

[00:37:54] But like, is it it truly ai? I don't know. The department is, it's traditionally three to four years behind commercial anyway, and then the use cases for AI and autonomy in the department are potentially more narrow than a lot of what's going on out in commercial. So I don't expect it to be the exact same.

[00:38:13] I look at it and say, From industry perspective, when we look at like the army of the Air Force, there's actually quite a bit of money going into autonomy and then the perception aspect of ai, that's really the applied AI that goes into a autonomy stack. I don't think it's an issue of the funding coming in.

[00:38:31] I think it's an issue of the PMs don't really understand how to design a program properly so that they can actually build software and then sustain like iterative development and delivery of that software to a program. I also think that there are, end number of projects, a lot of 'em are r and d projects across the joint force and the services that repeat the exact same thing.

[00:38:56] One of the things that always kills me, killed me at Maven and I didn't know much about ai when I started Project Maven. I didn't know much about the state of the service labs and their projects. But what I really quickly learned is that the department was investing a lot in what they were considering to be basic research, applied research.

[00:39:14] So TRL one through four, when commercial was well past that already, and I still see that today. We will go to the kind of mid TRL organizations in the army, the Navy, the Air Force and we'll see the work that they're doing. And it's guys, you're three years behind where we are right now. Like you would actually save money counterintuitively by getting rid of a hundred people that sit in this building and all the money that's coming in there and just buying an enterprise license.

[00:39:41] You, you would advance your capability development by three years. You'd give the program off something that they need right now, and you'd actually save 85% of your resources. But it's just not, people don't think that way, right? They think I've got my bodies of a hundred people and. They're all, it's my baby project that I'm working on.

[00:39:58] Why would I stop this and go buy something that's already commercially available? So it does, it kinda makes me sad from a taxpayer perspective.

[00:40:06] **Eric Lofgren:** That's just the way government is, right? The budgets are an entitlement budget. You're entitled to it. You got the fit up unless someone's gonna cancel you, right?

[00:40:15] Because it was so clear cuz commercial industries already here, you could just buy the license. It's hard to make that case and they'll say you're not meeting A, B, C, D, E requirements. One of the things I've seen a lot and seems to be concerning is these tight specifications from D o D for non-traditional solutions.

[00:40:32] So they'll be. Okay. The non-traditional, they can give you 80% of the capability of the requirement, but like at 20% of the cost or something like that, and maybe it actually does a bunch of other requirements that the government didn't think about. But because you missed that 20%, they could fend you off.

[00:40:48] The staff officers and the joint staff said, I needed this and this is the requirement. It is required. It's not a, it's nice to have mint. So what's your view on how DOD better collaborate with industry or non-traditionals to, get those, if you can do 80% for 20% of the cost, like that's a major, trade off, but it's also a major benefit potentially.

[00:41:08] You can just feel a lot more.

[00:41:10] **Colin Carroll:** Yeah. Oh man, I could go for hours on this one. Kath Hicks, maybe four or five months ago, she did an industry round table out in Silicon Valley. And there's 16 companies and they're all as non-traditionals like us, and everyone's complaining it's hard to get money from the government.

[00:41:26] It's really hard, blah, blah. And she basically said, I hear you, but it's not really my problem. And that created a little bit of uproar. There was like some articles was people like, oh, but she also said,

[00:41:37] **Eric Lofgren:** people have been thinking about this forever and I just landed here.

[00:41:40] I'm not gonna be able to solve

[00:41:41] **Colin Carroll:** this. So you're not gonna be able to solve your problem overnight. And there was some consternation out there, and I actually got a good laugh outta that and I was like, right on. Because the bottom line is working in the Department of Defense and with Department of Defense is hard, even with these acquisition reforms and et cetera.

[00:41:55] Okay, that gets published in 2024 and we'll see results from that in 2027. And by that point we've already, we're in the conflict, so it's like irrelevant. My advice to companies like mine is hire people like us here in this DC office who understand how to. Take a commercial software and work within the current constructs of the Palm and p PB and everything else how the government acquires capability because that is the way to actually bring your capability into the department.

[00:42:22] Complaining and like hoping for things like Ciber and, all these other, yes, I got it, but that's not gonna, it's not gonna say the end of the day. The other thing I think I'm gonna say that's probably controversial coming from a small business who's nontraditional, is at the end of the day, we win in conflict, not by companies like mine and not by SBIR, and not by reforming SBIR, which is, I don't know, half a percent of the duties budget.

[00:42:51] We win by the big primes. Being able to produce hardware with a software mindset and iterate on the software within that hardware, it is gonna be a production problem. And it is gonna come from the companies like Raytheon and Boeing and Lockheed. And if I were looking at how to reform acquisition and incentivize innovation, I would be looking at things like independent research and development and how to incentivize these companies to invest their own dollars a lot more than they already are to transition their mindset of how they currently view the world, which is incentivized by the Palm and how programs are run now to something else.

[00:43:34] That's how we win. Otherwise we'll be four years from now and they'll still be doing it the way they do it and everybody else will be out here complaining about how not they can't break in. And maybe we'll make a couple reforms and we'll make some different pathways for companies like mine to enter the d o d, but it won't actually make a difference.

[00:43:50] Honestly, the other option is it's 2028 and we go to war, everything dies in the first 48 hours and then we're stuck having to procure differently because we've lost 50% of everything that we had. And I don't really think that we wanna be in that situation.

[00:44:03] **Eric Lofgren:** So let me just poke on that a little bit cuz you said, these nontraditionals, these new companies, they need to kind of work through the system and understand how to get into the palm and do all that contracting stuff.

[00:44:14] So going back to my question, instead of expecting the government to do something differently, you're saying the nontraditionals just need to get at the front end of that system and say, no, that require was wrong. Let's just do the 80% requirement and then kick off that, that process.

[00:44:28] Cuz that could take another couple of years before like money is actually available through that. Hey, just go through the regular process.

[00:44:35] **Colin Carroll:** Yeah, I mean if you're, if you wanna start it all the way back at the requirement, then you're right. Where I think applied, I tuitions done a great job is finding those programs that have the requirement already and are in some phase of procurement.

[00:44:50] And honestly, if you're in industry right now and you're, you've got a mature solution that you're selling commercially, most likely there's a requirement for you somewhere in the department already. It's not like you're, Hey, we need this quantum computer in 2035 or whatever. And that's where we just, that does happen in some cases, but like on the whole, the requirements there, it's just finding the right way in.

[00:45:10] That's my recommendation. That's what we've seen work quickly

[00:45:13] **Eric Lofgren:** on the the industry side for the traditionals and their irad. One of the things that we've seen there was that GAO report recently that was like, of the 12 emerging tech priority areas. The the primes are basically not doing much of that, right?

[00:45:28] Like they're all in this kind of traditional stuff. And again, You can't really blame them, right? I want to put my irad to something that's gonna give me an roi. And that's probably gonna be, Army, Navy Air Force, what are you gonna build a requirement for? Because I want an irad to what your requirement's gonna be.

[00:45:43] And so when the money's there now, like I have the thing to, to fill that in so they're not incentivized to take that kind of risk, to build in the way that the iterative and, blending of hardware and software. just tell me what you

want because I know that when you say you want something, I'll build it for you and that's how this works.

[00:46:02] **Colin Carroll:** Yeah. So I completely agree that the incentives aren't there. I think if you recall a couple months ago there was the big FL about Siber reauthorization, right? And everybody got involved and there were like former SEC deaths. Their biggest priority was reauthorizing Siber. And I just laughed at that because it is basically irrelevant.

[00:46:21] E even with the ciber changes and reforms that they made, if you look at the POM and how the department budgets, builds capability, and then transitions to sustainment, SBIR is designed to fail every single time. You would have to be a PM That is perfectly aligned with the President's budget delivery, awarding your sipr.

[00:46:47] 18 months later, you're getting funding and you've built all the requirements 18 months later. It's like never gonna happen. The biggest reformative server they could do is extending it from 18 months, like three years. I'm dead serious. Yeah. Meet the cycle time that Jack the price up deliver in three years.

[00:47:01] Because if you're gonna fit in the current acquisitions process that we have, that's the way to do it. The other option is perform the acquisitions process, which that's a really difficult problem that people have been talking about forever. And honestly, it won't happen between now and the time we fight.

[00:47:14] So if we had spent 50% of the effort and energy of the SBIR Reauthorization uff looking at Irad, you, we actually could probably make some changes there. And I'm not an irad expert by any means. I've never worked at a large traditional company. We at Applied intuition work with these companies will take their irad and we'll build software for them and work with them.

[00:47:35] But I do think there's changes that you could do. In law to incentivize some of these companies to change their mindset with Irad, spend more look at the requirements differently. If r e was looking at that instead of SBIR, I think we'd get more bang for our buck outta that. I really do. And that I say this and people are like but you're a small business.

[00:47:54] Yes, I am. I also wanna win and not speak Chinese .

[00:47:56] **Eric Lofgren:** Yeah. Maybe I would like to get your view here on something else. Bill Le Plant said that I think might, cause a little bit of a, an uproar in the Twitter space

[00:48:05] **Colin Carroll:** And I saw the tweet links. What

[00:48:07] **Eric Lofgren:** did you say? Yeah. From, yeah, so just briefly for our audience, he basically says, you know what matters is production and I need to get munitions into production at scale.

[00:48:17] Now I don't care about your tech pro AIML or quantum thing . Where is that working at scale right now? If it's not, I don't care about it. I need things at scale. What's your reaction?

[00:48:28] **Colin Carroll:** I think that he is right when it comes to. break glass and now we're in the fight. I think between now and then my kind of meta larger point of we need munitions now is recognizing that we are gonna fight with the things that we have today, and that is a hard thing for people to understand.

[00:48:49] If it's flying, driving, or sailing, we're gonna fight with that. On the whole, we are not gonna have 3000 of some sixth gen thing or some new ground vehicle or some unmanned platform. We're not gonna have those things. What can the department do now? What can Congress do now to ensure that the things that are in development can be rapidly procured in production in 20 26, 20 27?

[00:49:14] It's things like I'm in an r and d phase, but I can award a break glass in case of production contract and ensure that money is POMed for. or can be reprogrammed, like massive reprogramming to buy 1000 of something or 10,000 of something in 2026. So I'm in my r and d cycle, I'm meeting my milestones.

[00:49:36] I don't have to go through massive DT/OT, I accept the risk there and buy a thousand and just have the contract ready to break. I don't think that exists anywhere. And there's probably way to do it with like defense production act like ways you could do that right now and modify some of the law to be able to award those contracts.

[00:49:52] But then it's, if the contract's good for 10 years, you don't have to worry about, interest and inflation and stuff like that. But that to me is an interesting way to do it. I think. I didn't see Bill's comments on production, but I

he's right. If you look at Ukraine, they don't care. They want things in their hands, they're gonna figure it out.

[00:50:11] **Eric Lofgren:** Some of this issue. To me as a non-technical person, if you have an AIML model that works in production, you can rapidly just get that out to, software is pretty much infinitely scalable. If I have this many vehicles, I can just duplicate that pretty quickly.

[00:50:25] But potentially, as you said, the department doesn't have, these platforms, they just haven't been investing in the platforms at scale in order to get those models, into production environments and quickly iterate through them. I was looking at some of the, just like the total investment, right?

[00:50:41] So we talked about the d o d, maybe \$2 billion is too high per year, right? Like maybe they're not really investing all that much money in these types of areas. But for a lot of the commercial companies they will be spending like Waymo, Cruise, emotional, Tesla, Uber. They spend billions of dollars up to \$10 billion or more on their platform.

[00:51:01] Does dod just not really understand the kind of scale or value that these platforms can potentially drive?

[00:51:07] **Colin Carroll:** I think that the department is used to purchasing hardware and the hardware PMs grew up in a system and PS are in a, they grew up in and are currently part of a system that builds and procures hardware.

[00:51:23] And so there is a complete lack of understanding in like how a Tesla or a cruise builds an autonomous vehicle. They just, they wanna be able to hand a bunch of money to a big OEM and then they get something back. Those OEMs have also been a part of this system so they don't fully understand, Hey, how do I build a software development lab basically in order to let's say I win the long term production contract, I can then push my software up into the vehicle.

[00:51:48] So generally speaking the commercial space is full of a bunch of competing OEMs. They're trying to get to market faster and with the best product, the cheapest product. So you'll see like it's okay to double triple 70 times respend on the same platform.

[00:52:05] Cause everyone has their own, they're not sharing across multiple OEMs, in my opinion, that is not actually okay for the department to do that. However, that's exactly what's happening. And it's not because they're

competing, it's because they don't know what the guy right next to them or down the hall from them or in the next building over is doing in that same space.

[00:52:23] So you're taking 2 billion and you're spreading it out across a, hundreds of different projects that are all doing the same thing poorly. If the department understood. Hey, I wanna, I want autonomous drought vehicles. that is a similar technical problem that requires similar data, a similar software technology.

[00:52:42] I'm going to then create an enterprise program to do that. Not tied to the actual hardware of a tank or an Omfi or an Rcv or a Striker Bradley or whatever they have. The Marine Corps, for example. They would save quite a bit of effort there, quite a bit of money. So that's why I say I think the amount of money that department spending is actually not the issue.

[00:53:01] It's how they're allocating it and like how the programs are designed.

[00:53:04] I as a leader, I'm a very. Top down strategy person. I trust I build teams of people that I trust.

[00:53:11] I let them do what they need to do to get the job done. But at the end of the day I'm not like a grassroots, let's grassroots the strategy at the Jake is a great example. We had one end of the organization that had the, I call it the funnel. It was a slide, it was the funnel, right?

[00:53:26] Basically the assumption of the funnel was the JAIC doesn't know what to do because we don't understand how the joint force fights and when it needs to win. So we'll just hang a shingle out that says the JAIC is open for business and then the services will provide us a thousand requirements and then we'll go through some weird process and down select the 10 that we need to do. The funnel. Or, We say, Hey, we're the joint force.

[00:53:48] We do a little bit of operational design about what we're supposed to do and where the gaps are and what the services aren't filling, and we invest our money to fill those gaps. When it comes to either enterprise capability and like development environment or when it comes to enterprise capability itself, I'm much more of the latter.

[00:54:04] So when it comes to problems within the department, I don't expect that the PMs and PDMs are gonna fix these problems, right? These are top down. I recognize this as a problem. I'm going to take some money. People will

be unhappy, but I'm gonna build an enterprise capability that at the end of the day, everybody will be better for.

[00:54:23] And like we are, we're not seeing that. And what I just said to you is so foreign from how it's done now. Everybody's super hands off.

[00:54:30] **Eric Lofgren:** Yeah. It's interesting you say that. I remember I heard someone say something to the effect how many China analysts do you need? Ultimately, if you have the right China analyst, you just need one.

[00:54:40] You don't need all these people coming in, cycling in for one or two years and then like they learn something and then they leave and they're , they're not the China analyst. And then for these programs, it feels similar, right? You have this funnel.

[00:54:53] And it always feels like they don't know what they want and it's like someone should know what they want. Someone with tenure and experience who has built a vision should know what they're trying to do here, rather than say, no, I've built all these skills, but there's a requirement coming down that's what I'm gonna go do.

[00:55:07] So it feels yeah, that,

[00:55:10] **Colin Carroll:** that, that funnel many, how many three stars or Schedule C political appointees are you aware of that spent the last 25 years of their lives thinking, when I'm in charge of the AI or autonomy, or X or Y or Z technical capability, when I'm in charge of delivering that to the department, this is what I'm gonna do.

[00:55:33] I've been thinking about this for 20 years, now I'm in charge. I got it.

[00:55:37] **Eric Lofgren:** They don't know what to do with the authority that they've been getting

[00:55:39] **Colin Carroll:** They don't even they're just, they're the most qualified person at the time that the job came open and they filled in well,

[00:55:46] **Eric Lofgren:** b put it in this way, who was like, they are legitimate people.

[00:55:50] They're selected for their legitimacy, not because they are founders or have built the thing in the past and they've grown that way.

[00:55:57] **Colin Carroll:** I also, yeah, I also think just the way that the Manpower system works in the Department of Defense, it's Collins time is up after two years, he's out.

[00:56:04] Okay. Who's a free agent out there in the pipeline? Up to that spot. Okay. Who It might not even be, who's the most qualified? It's who's the. the lottery, right? So someone just shows up who's the most available? . I will say this, if you compare what I just said about how many people have spent the last 25 years thinking about how I'm gonna deliver this new capability to the war fighter and like at a joint level, think about it the other way.

[00:56:24] How many, military officers have spent 25 years. It's like when I'm in charge of the division or when I'm in charge of the squadron, that's what they're trained to do. They're, that's what their experiences let them to do. They've all their mentors and everything is that is the pipeline to success.

[00:56:38] So we plug people in there and it works just great. 95% of the time. We plug people in over in like this kind of new technology area. At the, in the acquisitions parts of the services most people grew up in, that's what they know. So a hardware person does hardware. If you're lucky, maybe you got a software person that's now in the hardware acquisitions component.

[00:56:58] I don't know how you solve that problem. I do think that, we talked about HQ earlier. I think that there are ways to ensure that there are people that come in the Department of Defense for short periods of time, potentially for long periods of time that are super, that are passionate, that are knowledgeable about the capability, have some more fighter experience background, or can bring those people in to advise them and can move really quickly.

[00:57:20] We talked about workforce management earlier. I always joke there's the Eric Schmidt view of life. You had said something earlier about the government should never be a systems integrator. You know what I always say? The government should never build software. Ever. And joke about this because Eric Schmidt is out there, explaining how the, basically the department's a software company cuz it's what he knows, it's how he approaches life.

[00:57:42] We need software academy and stuff like this. It just, it's always weird to me like, dude, you ran Google. Google builds world class software. Why would you ever have a bunch of like lieutenants and E four s and GS 12 s building software for you? It doesn't make sense. You're just competing with industry that does this really well.

[00:57:59] So I look at what does a department need from a workforce management perspective, and from my perspective, it's probably with my bias. What we need are our technical program managers or project managers, if you're in the r and d space, that have a background in the functional area that they're trying to deliver capability to logistics, targeting intelligence, have a background in systems engineering, have a background in acquisition.

[00:58:28] That's who you're really looking for. And have background industry, like those four things. Hire those people, bring them into the department and then have them write requirements or work with the people that are writing requirements and write , their RFPs out to industry. And then have industry build the actuals actual capability.

[00:58:46] , I always see people as Hey, we need HQs to bring in more PhD computer scientists. If you're a PhD computer scientist, what would, why do you wanna be in the department, go work at Google, or go work at a company that's working with the department? That's the right answer.

[00:58:58] **Eric Lofgren:** Yeah. It's interesting. It was Eric Schmitt's visit, that actually kicked off some of the consternation that led to Kessel Runner, right? So then they got the in-house software. I want to, you know, ask you, okay, so we have these leaders, they're potentially not like technical leaders in terms of.

[00:59:15] Delivering the specific capability, but they tend to use a lot of buzzwords and we hear all these buzzwords. What are some of the buzzwords going a around today? And what's your view on those?

[00:59:24] **Colin Carroll:** Oh, man. What's, what are the latest buzzwords? I spin a year since I've been outta the department.

[00:59:29] I, the big one's still in the news now is Jad c2. So remember how we talked about, hey, 2 billion ai, we did a study, everyone just tags AI to their J Doc. Ja. C two is the next, it's been like this for a couple years, so it's not super new. But how do I tag what I'm doing to join all domain, command and control?

[00:59:46] I feel very strongly about Jas C too, having been at the Jake and having worked really closely with one of the combatant commands in a previous life. , I made a slide once, it was about a year ago, actually, maybe a year and a half ago where I was at the Jake. We were going to Cape and the DM A trying to get money for a Jad C2 capability development project.

[01:00:05] And the slide was bad c2, sad C2 Jad, C two , and it really upsets some people at the services and the joint staff. J six. I got a nasty note from a general the bottom line though is I think where we've evolved to in the last year is you're starting to see service acquisition executives and some others saying, Hey, maybe the services aren't a hundred percent incentivized to deliver joint capability.

[01:00:30] They incentivizes to do Title 10 Mandarin equip for their service. And that's like a huge change to me. I don't know if it's a grassroots thing services are recognizing or if there's more reading, the kind of handwriting on the wall from O S D, which is, Hey, you guys have done the best job at this and we're gonna be taking this away from you.

[01:00:47] We're not really sure what this looks like at the joint level yet. I think Congress is gonna weigh in here, but they do have

[01:00:52] **Eric Lofgren:** a program office that they're setting up some kind of like special program office

[01:00:55] **Colin Carroll:** for it. There's two things ongoing at the joint level. One is at A and s and that's probably the program office that you're referring to.

[01:01:03] The other is at cda AO in the the algorithmic warfare part of c D ao. And then I think Congress is looking at like maybe a joint program office. I think the Senate's looking at the joint program office. The house is looking at maybe keeping something in C ao well, to see how it plays out. But Jet Twos a really is just a broad problem.

[01:01:20] Everything and every anything is jazzy too. So solving some of those distinct, lines of effort and allocating them. We were at the SCS P event a couple months ago and Brandy Vincent from Defense Fed Scoop, something like that, she asked Kath Hicks question and she said, Hey, who's supposed to be doing Ja C two Ja two's been around now for three years, who's got the lead?

[01:01:44] Ka got very mad at her and said, the question isn't who the question is what we need to talk about, what JADC two is. I got a good laugh outta that one because I think we all know what JADC2 is. We've been talking about that now forever. I think the big question is who's got the, thumb on their forehead saying, go do this at the joint level, deliver capability to the combat commands where they need it.

[01:02:02] I think that they, the department has an idea of who it is. They just might not wanna say out loud yet, get in front of Congress. There's probably some competing agendas Yeah,

[01:02:10] **Eric Lofgren:** the government tends to live in abstraction and not want to say here's an individual with this mission and you're

[01:02:15] **Colin Carroll:** gonna go deliver.

[01:02:16] It's a fireman problem. Yeah. It's the fireman problem. I tell this to my team all the time, I've been telling this. So the fireman problem is the boss walks in to the conference room with all the staff and says, Hey, there's a fire in the hallway, guys gonna put the fire out. And everybody looks at each other and they're like, I'm not a fireman.

[01:02:33] I don't have a hose. Then a week goes by, two weeks to go by. Another meeting boss comes back in, Hey here's fire's bigger out there probably needs to get put out. Everyone's I don't have an ax. It's not me, I'm not the fire chief. Then finally, like the whole building's on fire, everybody's dying and it's okay, now we need to put this crisis fire out.

[01:02:52] You're right. The department doesn't do task purpose end- state very well because to be quite frank, it will mean upsetting somebody somewhere and typically at that level It's more of a kind of team consensus type thing, especially in like today's environment. I think if you go back 10, 15 years, if you go back to Gates, he didn't care who was upset.

[01:03:12] He wanted an M rap, he got his M rap, he probably pissed off a lot of people. I don't see us in that place with the current kind of structure that we've got.

[01:03:21] **Eric Lofgren:** The m a is super popular again because as we're getting into great power competition, everyone like reflects back on the m a and my colleague Jim Hasek has a book out on it and all that stuff.

[01:03:31] But for me at least, it's just look, the Secretary of Defense was basically, like the program manager for that thing and his attention is not gonna be unlimited. . How do we think about this in terms of scale so that you can move fast at purpose across a whole range of programs.

[01:03:46] And of course, there's this new industry commission from the Atlantic Council, chaired by Mark Eser and Deborah Lee James, you are an

industry commissioner on that, what are your thoughts here on what you think needs to happen? Because you're saying all this acquisition reform will get recommendations in a couple years and then implementation will be way too late.

[01:04:04] What do we need to do on that front?

[01:04:06] **Colin Carroll:** Yeah. I feel very strongly about any kind of discussion on reform or the kind of think tanky stuff that's going on right now is tie it to a date where we assess that there could be a conflict and then back plan everything from there. And if anything you're talking about is a reform that is, Not going to have an impact by that date, then it's probably it's worth talking about and there's a worthy end state for that, but it's not the thing that I personally care about.

[01:04:40] And what I see is on the whole, there's a lot of people talking about things that matter in 2035, and God forbid that we're wrong then who's talking about innovation between now and 2027? And yeah, that to me is a niche spot in the kind of think tanky space that people aren't really focused on.

[01:05:00] Everybody wants to talk about emerging tech priorities and r and d acquisitions reform that, in my opinion, doesn't deliver what we need when we need it. If someone said, Hey, Colin, you're gonna run a think tank project for the next. It would all be focused on what can be done between now and 2025.

[01:05:16] So in order to deliver something by 2027 and to be quite frank, it involves some crazy things. Hey, I understand that Title 10 is services man, train and equip. However, that's failed. And if you talk to the combat commands, they'll tell you that's failed. So let's get crazy and give combat commands a lot of r and d money to build and people, right?

[01:05:37] Cuz they can't do it with the people they have now. They're in the, there's a fire at the door right now. We gotta put it out every single week. How can we experiment with some authorities like that with Congress? How can we experiment with HQ at lower parts of the department with longer terms?

[01:05:52] How do I get a rick over in place for the next five years somewhere, for a capability that really matters? . And I don't know, I have personal opinions on what some of those capabilities are. A lot of them, my opinion, are not emerging technologies anymore. They've emerged, they're out in the commercial space.

[01:06:04] It's how do I get it in the hands of a war fighter? How do I ensure that the contracts are in place, that when we need them, we can rapidly crap out a thousand or 1500 of these things, or 10,000 of them. You remember they

[01:06:15] **Eric Lofgren:** were talking about Doug Small, the Admiral in the Navy as being the rick over for Ja C two and Overmatch.

[01:06:21] I often think about this too. It's just like we used to have like founder led programs, like a rick over, like an Admiral Red Rayborn, like a, a McLean from from China Lakes. We just don't seem to have them. It's not like the personality and the leadership drives the program.

[01:06:34] It's like the program drives, like the organizations and the people, what's your thought

[01:06:38] **Colin Carroll:** on that? Right now they rotate every two years. To another, leader, just the cycle of manpower and like how things are. So they're not incentivized to take risks.

[01:06:48] Everybody is, I just need to do my thing for two years, sustain this and be out. Where there have been PMs that are super aggressive, guys like Drew Cukor, Colonel Cukor, and they wind up not getting a star. And so that people look at that and go okay, I don't really wanna be like that. So it's a, to me it's a balance between the individual wanting what the individual wants and the individual needing to do what's right for the country when it comes to it might kind collins's opinion on what the department needs or what the US government needs.

[01:07:17] I think Rick over and the nuclear navy is a really good example at the service level. I personally think that something like project, the Manhattan Project, I'm reading the American Prometheus right now. It's a great book. That is probably something that we could use for certain technology areas outside the normal construct of Title 10 where you keep somebody in place for seven years there and there's a defined end state.

[01:07:39] The interesting thing about the Manhattan project is that service, or, the Department of War and service development, unlike bombs, did not stop during World War ii, right? Everybody made was making a better bomb site, better fins, larger payloads throughout the time that there was this other part of the department that was working on a revolutionary capability that basically changed the strategy of how we fight wars.

[01:08:04] I think that something like that could probably be a really good example at the conceptual level for what the department needs now, which is not a zero sum. Hey, the Army or the Navy or the Air Force is gonna do it so nobody else can do it. But it is a yes, let them continue to do their thing. How do we find some money to build something on the side that can jump everybody ahead 10 years?

[01:08:23] And right now that's I think Congress is probably okay with looking at something like that because they're looking back and saying, Hey, we're just not seeing the results. And the combat commands would also be super supportive of something like that. Services, I'm not a hundred percent sure about.

[01:08:35] It's taking away something that's rightfully, inherently theirs, but I think if you actually had them take a step back and say, assess, are we, have we done the right thing? Have we delivered what's needed over the last 10 years or 15 years? They're honest with themselves. They'd probably say no, that we're not, it might work for the infantry battalion or the, F 16 squadron, but it's not right for the joint force.

[01:08:58] **Eric Lofgren:** You know, One of the things that, at least in this acquisition world, it's No one has the authority to say yes and actually do something unless it gets all the way up to the vice or chief of staff level or the secretary level. And so the whole system is basically if those people want to pivot the service and Congress is on board, then they can.

[01:09:15] And we've seen that, with the Marine Corps. Commandant Burger is trying to push towards this force design 2030. And Congress actually seems to be on board for the most part. And they're like divesting from their own things. And they're not asking for new money, they're just doing it within their own funding.

[01:09:30] Do the rest of the services need to do something similar or is there, a challenge area, does this actually help us get to, the transformation within the timeframe you need or does it

[01:09:39] **Colin Carroll:** not? Yeah, the interesting, so I'm a Marine And so I'll speak from personal CO and not Marine Core column here.

[01:09:47] Future Force 2030. So the timeframe there, in my opinion is probably not right. My biggest fear about Force Design 20 30 or Future Force 2030 is , the dip in capability will happen at the worst possible time this decade.

Do I think that the concept of divesting from certain certain platforms to create a more expeditionary and mobile force is the right answer?

[01:10:11] Yeah, I think I do. The one thing about the Marine Corps is, and I think this just in general, when it comes to people telling me, okay, if you're gonna do something crazy and build unmanned autonomous systems what's the dot M L P F and what's the, DT OT associated with that?

[01:10:25] I think. Looking at Ukraine is a really great example. So what do you, what do we need in 2027? We need a military comprised of individual people who are flexible and smart. That means that they were trained to do some job and now they're able to do some completely different job. Why? Because the technology in their hands at that point is very different from what they had when they were trained or educated, even prior to training.

[01:10:50] And I think when we look at a, it's a very rigid, flexible service, right? I'm an intelligence officer, I can't go do artillery. But if you handed me a name, a company's Laing Munition in a iPhone, could I steer that around? Yeah, I could cuz I played Xbox as a kid. So that's the type of person I think that we need in the force.

[01:11:07] I think the Marine Corps has traditionally been pretty good about being flexible and adaptive when it comes to that. I'm probably more concerned with some of the other services. Gut feeling on Future Force 2030. I think that the Commandant is driving it. I think that on the whole members of the Marine Corps are bought into it. However, I still see things like, Hey, we just awarded a contract to a large OEM for the amphibious combat vehicle and we're gonna get 300 of those things to replace the aav.

[01:11:40] If you look at that contract the components for that are gonna be super proprietary. And when you're in the first island chain, you're never, if that thing breaks down, you're never gonna get those parts. So the kind of like innovative thought process on the acquisition side, which by the way was seven years ago cuz went through multiple RFIs and prototyping and in lowered production and now we're like, yay, we're gonna buy 300 of these things.

[01:12:01] Nobody said, Hey, I need to be able to have a Marine go to Advanced Auto Parts Philippines and get parts for that thing, right? But that's what we're in. We are committed to this and we're gonna buy these parts. So I don't know, it just makes me, it makes me a little nervous about the words Marine Corps saying with the capability that they're buying and how those things add up.

[01:12:19] Well,

[01:12:19] **Eric Lofgren:** relative I definitely would agree with that. In terms of like the Air Force, for example, with Agile combat employment, we, I don't think we've seen any investments that make sure like you can actually be distributed, right? And actually sustain these things. The Marine Corps, maybe it is like a 20, 30 thing, but they have been investing in 3D printing at the point of need and like contested logistics things in a way that the rest of the services just don't seem to care about.

[01:12:45] And I think I agree with you though, that maybe those capabilities and the ability to do that, in a denied place, Won't be there in 2025, but it seems like they're thinking about it.

[01:12:55] **Colin Carroll:** Yeah. So the Marine Corps, warfighting Lab McWell is definitely looking at so it's the r and d arm of the Marine Corps.

[01:13:01] It's definitely looking at how and on r on how to acquire and deliver some nontraditional capabilities outside of the Marine Corps program offices that are buying hundreds of, name a large platform. I still think though, that on the whole, there is a cadre of Marines that have spent a lot of time in Afghanistan and Iraq and view problems that way. So here's a great example. I was at the Pentagon a couple months ago in my Marine Corps capacity. We had a big. Discussion with the maths and pp and o hosted it.

[01:13:41] There was a guy sitting next to me, he was a left witch winner, which means he was the best Marine Corps company commander of his year. It's a big deal in the Marine Corps infantry officer. And I asked him, Hey, he is gone out to three MEFs. He's gonna go to Okinawa. Hey, if you're in the fight in a couple years, what vehicle are you driving around the Philippines or name a name an island.

[01:14:01] And he's I'll be in a, I'll be in a humer m a. And I looked at him like, dude, your to weapon when you get there is not a M four. It's not a MRAP, it's not a mark 19 grenade launch on your m a. It's a GSA credit card and you're gonna go rent a car, a truck, and you're gonna drive around that thing. That's how it's going to.

[01:14:21] Why? Because a DF 21 from China isn't gonna be stopped by an m a anyway, and you're not shooting your M four at a, at, a bunch of bad guys shooting at AK 47 back at you. You're guarding airfields and rapidly moving

around the island trying to get logistics in trying to survive, manage your signature.

[01:14:39] That's what you're doing. I don't think that concept is there at a lot of levels in the Marine Corps yet. So how do you train to that? Right now? He's gonna go to Okinawa and he's gonna go to the field and he's gonna have his Humvee, this whole he'll have 27 Humvees for his infantry company. So the right answer is how do you get a flexible person who can adapt really quickly to something that they're not familiar with, and then gain that knowledge and ensure.

[01:15:06] Goes to the rest of the force rapidly. So it might not be that company commander, it might be his boss, it might be his boss's boss. But how can we say, Hey, we're gonna be, we're gonna think about problems differently. I don't know.

[01:15:16] Sorry. On the Marine Corps thing, the divestment piece, probably not the best answer the way they did it, in my opinion, probably not the best way to do it.

[01:15:24] You never want to just give things up without getting funding back. And so I think that one will probably haunt the Marine Corps. And when it, when you look at some of these goss and the people writing the letters there's probably two reasons. One is, How we did the divestment from a funding perspective.

[01:15:40] Then the other is that they weren't consulted. So it's a little bit of individual pride there.

[01:15:44] **Eric Lofgren:** Yeah. And the Navy itself has a major force structure problem in the 2020s. , we don't know whether that's gonna be resolved or not. Elaine, Lori is pretty pissed off at it. Some congress people are, it seems like either you just fund those ships or not.

[01:15:59] Grow the top line or not. Is there, cuz it seems like what you're saying here is, I agree with where they're trying to move, but the timing of this is incredibly dangerous. So is there any other way around it besides just like saying, Hey, I know the US has spent a bunch of money, on all these other areas and we're in an inflationary environment and the debt, blah, blah, blah, but this has to happen.

[01:16:24] **Colin Carroll:** When you say this, you talk, you talking about, I'm talking about all the different changes that they're trying to do. I'm just,

[01:16:29] **Eric Lofgren:** the changes they're trying to do, but also, plussing up the top line to a trillion dollars or whatever it is that you're gonna sustain what you have now, but then you're also moving to the new paradigm at the same time as opposed to , like everyone just says, oh, divest to invest.

[01:16:43] It's a broken strategy. Is that true or not?

[01:16:45] **Colin Carroll:** Yeah, the top line's gonna be a trillion dollars sway and sea. It's going to happen. If it'll be close this year and then with inflation it's gonna 20, 24. It'll be a trillion. Elaine is the new billion, huh? ? Yeah. When it comes to the gray hole ships, I like if you look at the Marine Corps problem, it is a legit, it is, it's very similar to what Bill Plant said, right?

[01:17:07] Which is I've, production weapon systems, weapons systems, munitions, primarily the Marine Corps problem is how do I sustain a joint force and myself in an area that is very difficult to get things into and then things will die. Having more Gray Hill ships in that scenario is probably not super useful anyway.

[01:17:25] It's gonna be, how do I get things probably slowly, looking at how the cartels move stuff around. But with a little bit better tech from Guam into the island chains and just having a rotation, 10,000 of those things. That's how we need to approach the problem. So much more distributed, is that who owns those?

[01:17:44] The Navy no, probably not. Those are Marine Corps ships. So it's just a different way of approaching the problem. So the Marine

[01:17:50] **Eric Lofgren:** Corps and the Army will have more ships than the Navy . .

[01:17:53] **Colin Carroll:** Yeah. From a different mission though. Yeah. And maybe not a ship. I don't know the technical definition of a ship. probably, I probably should as a Naval Academy grad, but I don't.

[01:18:00] The other thing I think is interesting is moving. So the initial kind of wave to move in, there's probably some non-traditional ways that we would look at that, which is take h Chia for example, and the evacuation out of

Afghanistan. A lot of people look at that debate, right or wrong, doing it strategically debate right or wrong, we saw this coming or not.

[01:18:22] One of the kind of not as well credited takeaways that I took away from that. . We are the only country on the planet that can move 75,000 people across the world in 96 hours. And we do it not by good planning, not by good command and control, it's just by pure logistics and spending money.

[01:18:45] And so if we had to do the same thing in the Pacific Theater, we could do that as well. it's going to involve commercial shipping, commercial airlines, moving people and stuff really rapidly before, the theater is set. And then those things can't enter the theater.

[01:19:01] They enter at their own risk. And then it's gonna involve adaptive, flexible people on the ground they might not have their Humvee, they might have whatever they trained with, but they can I don't even, what's the word? Scrimmage for it or whatever. And get what they need.

[01:19:12] And that's like a different force. So I don't know. how we fights can be very different from, I think, how we're programmed to think about the fight right now. So as we

[01:19:22] **Eric Lofgren:** wrap up here, I wanna bring it back to the acquisition space and what you guys are working on at Applied Intuition.

[01:19:28] Where are you guys going? And from a business perspective, what keeps you up at night?

[01:19:32] **Colin Carroll:** Ooh, let's see. Applied makes commercial autonomy software for trucking and automotive primarily. So generally speaking, in the commercial space, we started out looking at startups like us. So companies that did not have a lot of cars or trucks driving around.

[01:19:48] But required simulation software to drive those miles in simulation. Over the years, we've added a lot of the larger OEMs to our customer portfolio. So these people have thousands, millions of vehicles driving around. We've extended beyond just simulation for autonomy, software to data management, and then some on vehicle software work as well.

[01:20:08] Cause one of the things that we've realized is on the whole on vehicle software is not that great. My CEO asked me to come in and build a government team. So we do defense and we do transportation primarily. Most

of what I focus on is defense. Most of my team here is defense. And so we're taking our commercially developed software with a lot of investment dollars and a lot of users using it already.

[01:20:29] And I spent the last year looking primarily at the army. And peo, ground combat systems. So where in the Army did they have requirements already at a program office. I joke with my team, I have one rule. The rule is only talk to oh six s and oh five s with money, which basically means talk to programs of record and everybody else I just tend to ignore.

[01:20:48] And that's worked out relatively well for us in last year. Where we're headed is in the maritime and aerial spaces, very similar. Very similar kind of use case and very similar approach that we're gonna take. What keeps me up at night? Yeah. From a business perspective, I joked earlier that our biggest competitor was the Army over the last year, and that's in like the mid tl r and d space. I think if there weren't enough money to go around then that would keep me up at night for sure. But what we've seen is the program officers are funded to, to Take what's coming out of the mid TL, high tl and then, take it that last mile and then field it.

[01:21:27] And so they've got the funding required to do that, and they're willing to go to commercial and do it. . What keeps me up at night from a business perspective? , so just my company's not a national security company.

[01:21:37] We are a commercial company. I have hundreds of engineers back in Mountain View that wake up every day and they're. , their kind of sole thought in life is, how do I keep a car on the road not hit a pedestrian stop at a stop sign? They don't wake up and think, Hey, China in four years, or China in five years.

[01:21:56] So we're not a sharp company. Our investors did not invest in this company as a national security company. But what I've seen is actually super encouraging, which is engineers learning duty problems and becoming very interested and passionate in wanting to deliver this capability.

[01:22:14] And it's probably more on a technical passion perspective, which is, hey, these are hard, challenging problems and therefore I wanna dedicate my time and resources to solve them. Which is actually interesting to me. When I was on Maven we had the Google fiasco, which is one of the more public instances of Maven and.

[01:22:31] I do think when I joined the team a year ago, I was a little nervous about going to Silicon Valley and thinking, Hey, we're gonna get six months

into this and then the company's gonna get cold feet or there'll be some kind of protest. We haven't seen anything like that at all. And honestly, what I've seen is some of our commercial customers also jumping into this space, having seen what we're doing on the simulation side.

[01:22:54] So bringing their autonomy software into like the Army, for example, or the Air Force. That's super encouraging to me. I think that's where we need to go this country.

[01:23:02] **Eric Lofgren:** Great. Any last thoughts for our audience?

[01:23:04] **Colin Carroll:** Yeah, I think I'll go back to where I started at the beginning, which is, working with the Department of Defense from industry can seem like overwhelmingly frustrating at times and. I facetiously joke when we were talking about Catholics earlier that you need to invest in a government team.

[01:23:22] Having been in the government and given many contracts and work closely with small, non-traditional software companies like my own. The thing that we would always recommend to them is like bring, start a government team. If you're serious about doing this work with the government and start a government team.

[01:23:37] The government team consists of some BD people. It consists of cyber security consists of, so for, dod risk management framework and all the information insurance requirements, it consists of a legislative policy teams or government relations. And it might consist of a marketing team and then all your customer facing engineers.

[01:23:55] So how do I understand the government's the duties requirements and then relay that back to my engineering managers and product managers so they can build this. If you're in this space and kind of dabbling in it, then you'll probably continue to dabble in it forever because it's just too hard.

[01:24:10] The government's not gonna reform itself and bend over backwards to help you out. It's just not designed that way. Lockheed Martin's lobbyists are never gonna permit that. So take the leap, make the investment. There are lots of great people coming out of the dod that are willing to help as well and have the knowledge.

[01:24:27] So it's my advice.

[01:24:29] **Eric Lofgren:** Colin Carol, thanks for joining me on acquisition Talk.

[01:24:31] **Colin Carroll:** Yeah, Eric has been great. Thanks man.

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