



Lt. Gen. David Deptula, USAF (Ret.):

Well, good afternoon ladies and gentlemen, and welcome to our Mitchell Institute panel on the future of command and control. As just a bit of a stage setter, effective, resilient command and control, as all of you know, is going to be absolutely critical in tomorrow's battle space. A matter of fact, it's what's going to give us an edge over our adversaries because they all are very cognizant of our reliance on connectivity, particularly after 20 years of operations in a permissive spectrum environment.

Now the next war is going to see US forces going up against an enemy with extensive spectrum warfare capabilities and a doctrine that they intentionally built on disrupting our kill chain. And in response, the Department of Defense has been emphasizing combined joint all domain command and control. However, the lines of effort among each service have had varying degrees of transparency, clarity, and feasibility. It's absolutely vital that we do this right the first time because we simply don't have the luxury of time.

So to address this critical issue, we have with us today Brigadier General Luke Cropsey of the Air Force. Wow, that's awesome. So you know who he is, he's the Integration Program Executive Officer for Command and Control Communications and Battle Management, for those of you who didn't. We have with us Brigadier General Dan Clayton, Director of the Advanced Battle Management System, ABMS Cross-Functional Team, and Mr. Doug Beck. Hey, Doug, you won.

Doug Beck:

I brought some teammates.

Lt. Gen. David Deptula, USAF (Ret.):

He's the new Director of the Defense Innovation Unit. So before we dive into discussion, I'm going to offer each of our Air Force officers a chance to give some opening thoughts, and then I'll ask Doug a question to get kicked off. So let's start with General Clayton.

Brig. Gen. Daniel C. Clayton:

General Deptula, thank you very much for the opportunity. AFA, thanks for this opportunity. For everyone here today, thanks for taking some time to join us for this discussion. So I'm new to this position, the Director of the Advanced Battle Management System Cross-Functional Team as of about two months ago. And what I will say is that in those two months, I've learned that in addition to religion and politics, you probably shouldn't talk about Command and Control outside the family because as soon as you do, you start getting emotional visceral responses for why you're wrong and they're right.

With that stated, I can say that the Department of the Air Force is actively modernizing Command and Control for decision advantage and I'm really grateful that General Cropsey is here with me. As part of operational imperative number two, he and I are now almost best friends in the work domain. We go just about everywhere together as the operator and as the acquisition person, we're trying to do everything that we can to ensure that we get this right. And also with Mr. Beck here, the partnership that we have across the broader ecosystem of industry and universities that are helping with this process is phenomenal. So, thank you and happy to be here.

Brig. Gen. Luke C. G. Cropsey:

Yeah. So I would just echo those words, in addition to what Flag just said, I would say not only are we professionally tied it ahead, but we also actually like each other, so that's helpful.



The other thing I would do is I would add one more word, C2 tomorrow, but I'd say now. We are getting after this problem space in the context of right here and right now. We are deploying capability as early as next month and there's a whole train of things that are in process right now that are going to really revolutionize the fundamental way that we think about and do Command and Control.

I'm especially honored to have Mr. Beck here as well because so much of what we're going to do is tied directly to our commercial capabilities and capacities across the globe really, and our ability to rapidly integrate what's going on in those spaces into the architecture and into the weapons systems that we're designing for tomorrow is going to be pivotal to this. So I think we're going to have a really healthy conversation and looking forward to it. Thank you.

Lt. Gen. David Deptula, USAF (Ret.):

Doug. You recently left a job working directly for Tim Cook at Apple for a job working directly for the Secretary of Defense, helping with problems like this. So why now and how is helping with things like JADC2 a part of that decision?

Doug Beck:

So first, thanks General Deptula and thanks to everybody at the AFA for giving me the opportunity to be up here. And it's actually an honor to be between these two gentlemen, which is exactly perfect, because where we need to sit is right in partnership with both them and between the operator and the acquisition side in order to get after this problem.

So I kind of look at this from three lenses. You mentioned I've been at Apple for the last 13 years or for Tim that whole time, but I've been a naval officer and I know I'm kind of in the wrong room for that, but a naval officer for 26, much of that time in INDOPACOM as well as some time in Iraq and Afghanistan and some at the origin of DIU, which I'll kind of come back to. And then a fair amount of time in between those two worlds in sort of an advisory capacity for the department. So bringing those three lenses together is kind of how I first got involved with the birth at the beginning of DIU, versus as an advisor and then as the joint reserve component commander.

And really back then, Secretary Carter was absolutely prescient about the need that we are all engaged in dealing with right now to take full advantage of the incredible power represented by our commercial technology sector in getting after our most critical strategic crisis. And he was very focused on the People's Republic of China, even back then. This is in 2015. And the irony back then was that the Silicon Valley that I kind of grew up in, which was literally built at the intersection of government, the private sector, and academia in support of national security first during the Second World War and then really through the Cold War, we lost our way on that and we had to regain that because one of the largest strengths of our nation was completely untapped.

Now we have to capitalize on that because, as you said, we don't have the luxury of time. And so much of what we're doing as a department and as a nation will deliver results sometime in the 2030s, we don't have to the 2030s, we have now and we have the next few years. And commercial technology in many cases has the benefit both of speed, because in some cases it's ready right there, and in some cases it's just there are capabilities in at least 11 of the 14 technology areas we care about most that are just going to move faster in places that are driven by the relentless needs of billions of consumers and the enterprises that serve them. And we've got to tap into that capability for our most critical problems.

And so we've got to do that alongside the kind of more highly classified bespoke things that we've got to be doing simultaneously. That's basically what it's all about. And for me, the opportunity to be a part of helping to meet that imperative at this critical moment, if there's a way to make even a small difference



to our ability to deter that major conflict from happening or win, if we are forced to fight it, there's no way I'm not going to come sign up to do that.

Lt. Gen. David Deptula, USAF (Ret.):

Very good. Thanks for that. General Clayton, let's kick right off with you. Now we're increasingly hearing leaders use the term combined JADC2, emphasize the importance of our allies with respect to the future of Command and Control. So what role do you see them playing and what's the priority for getting them integrated into our Command and Control architectures?

Brig. Gen. Daniel C. Clayton:

Yeah, I think that's a really important question to answer here. So from the Advanced Battle Management System Cross-Functional Team perspective, we've taken a look at the operational environment of the future and we recognize early on that, just the United States Air Force, just the United States Space Force wouldn't be able to do everything on our own. And so, through the functional decomposition that we've done with our transformational model, we've actually been able to share that with the Five Eyes, with the JASDF, with the ROCAF, and initial conversations with the French. And the reason why we're doing this is that we're trying to get after the integrated by design part, which is in order for us to be a bit more interoperable in the future, it starts with the architecture and the design today.

And so, I think all of us are familiar with a lot of the systems that we have today were designed many, many years ago and sometimes decades. And then at some point in the future, we decided that hey, we need to try to connect them together as opposed to designing the architecture on the front end so that they could actually be interoperable and connect at the beginning. And so from that, to answer the second part of the question, it's a high priority that we make sure that the allies and partners are in the work that we're doing from the very beginning.

Lt. Gen. David Deptula, USAF (Ret.):

For both you and General Cropsey, the crux of CJADC2 is connecting appropriate sensors to shooters across all domains in the appropriate time, including all service components. So how do you conceptualize the process to deliver the most appropriate information across this extraordinarily complex battle space?

Brig. Gen. Luke C. G. Cropsey:

So it starts with the operational problem that you're trying to solve, right? And part of the reason we don't go anywhere without each other is because at the end of the day, it's a conversation that has to happen, right? Requirements are verbs, acquisition systems are nouns, you need both to make a whole sentence. And I think in this context, what I would tell you is that everything that I'm doing is getting driven off of the operational outcome that General Clayton's team on the CFT end of this business is defining with regards to what it looks like to actually go through decision advantage in a particular context for a particular scenario with a given mission thread at a particular kill chain level.

So one of the things that we're very emphatic about, inside of the PEO and then in obvious cooperation with the CFT, is that we're not going to do this problem, quite frankly, in the abstract. If we do it in the abstract, we fall into the ditch of trying to boil the ocean. And I mean the secretary said more than once that he's got a long list of failed CT programs that have never gotten off the ground because they've collapsed under their own weight. The reason they collapsed under their own weight in a lot of cases is because they're trying to do all of it all at once everywhere.



So we're very, very focused and we're very, very committed to making sure that the operational priorities that the CFT sets for us on the acquisition side are front and center in everything that we do. And then the next piece to that is really, do we understand from a mission engineering standpoint how the things that have to happen in the operational environment get translated down and into the architecture? And we're very specific about that. So, Dr. Tipton, my chief architect, he's running the team of unicorns that are doing that architecture lift for the department to make sure that there is a direct correlation between the operational outcome that we need and the architecture that we're actually going out and employing.

And people keep saying, "Hey, what is it like to have the secretary give you have the hardest job in the Air Force?" Well, if you're me, you go find the smartest team of engineers and you give them the problem. So to be honest with you, I'm not solving the hardest problem on the Air Force, Dr. Tipton and the engineering team is solving that for us. But I think it's important that we don't look at this problem as, "Hey, I'm going to get my input from the CFT and then I'm going to go over to my corner and I'm going to do my thing and I'm going to come back later." It's a constant iterative dialogue and discussion that we're having every single day and we're not kicking it down the path and then throwing it back over. It's an us conversation, and it's not just General Clayton and myself, this gets back to the industry component to this as well and the ongoing dialogue that we're having with them.

Brig. Gen. Daniel C. Clayton:

Yeah. And I'll just pile onto that one. I'll try to combine the mission threads with the engineering and then also with industry. And so I think the most important word in that question was the process. And so from the process standpoint, our team has been very deliberate and methodical about going out to the geographic combatant commands and assessing what operational problems are they trying to solve, making sure that we're smart on what it is that they think they're trying to do, and then we read that back to them and validate, yes, this is what you're trying to do. That's the joint mission threads that we've come up with. There's six of those for a specific AOR.

And then we run those specific mission threads through the transformational model that I already described to identify, again, it's hopefully domain agnostic, so getting away from some of the service-specific C2 systems that we've had in the past to figure out exactly where, what decision needs to be made at what time. And then from the engineering side, because we're doing this in a digital engineering environment with a model-based systems engineering approach, hopefully in the perfect world, the outputs from our process become the inputs into General Cropsey's architecture and system engineering team to run with.

Lt. Gen. David Deptula, USAF (Ret.):

Well Dan, that's a good segue into a follow-up I've got for either or both of you, and that's how are you looking to prevent stove piping of systems like ABMS and the Department of the Air Force Battle Network with what the other service components are doing?

Brig. Gen. Daniel C. Clayton:

Yeah, that's a good follow up. I think luckily for us, we see ourselves as the Department of the Air Force initiative, so we have Space Force operators on our team and so does General Cropsey on his team as well. And so we're integrated by design in the sense that initially we're Air Force and Space Force working together.

I'll go a step further with the transformational model to say that one of the decision domains that we've looked at, besides Battle Management, is planning and we spent the last nine months with the



Department of the Navy working through that. So that is one step to break down some of those stovepipes. Again, getting back to the concept of trying to build it from the bottom up together, but also with the CJADC2 cross-functional team on the joint staff, we're also tied in with them almost on a daily basis to ensure that what we're working on is getting after the strategic vision that they have set forth as well. So that's one way to get rid of those stove pipes.

Lt. Gen. David Deptula, USAF (Ret.):

Luke?

Brig. Gen. Luke C. G. Cropsey:

Yeah, I think on the acquisition side, I mean we have a lot of touchpoints. So kind of back to the Navy point, we're working very directly with Project Overmatch and Admiral Small on that front. We're working directly with a number of Navy programs in regards to different potential waveforms and aerial networks. We have a lot of combined interest on that front. The Navy's done some great work there.

Look, I'm an engineer, right? The best compliment I can give you is to rip off your good work and use it, and we're killing not invented here on contact. So it doesn't matter where the brilliance happens, I'm all ears. And if there's a way for us to pull it in and drive it and then have that commonality as a virtue of that, we're all in. And to that point, we're talking to several different, not only match comms and field comms, but also different co comms and how we help integrate that backplane between all of those different organizational entities and capability requirements. So, there's a lot of connective tissue here that we're trying to be very deliberate and specific about how we bring together.

Lt. Gen. David Deptula, USAF (Ret.):

Okay. Doug, you were there, as you mentioned in your opening remarks, at the birth of DIU eight years ago. Could you give us a sense of where DIU started, where you're planning to take it, and then how actualizing things like CJADC2 fits into your grand scheme?

Doug Beck:

Absolutely. Thank you. I guess if you go back to the beginning, that first phase of DIU, which was stepping into that world where we really didn't have that connection, really it was just about building a bridge kind of at all between the department and the commercial tech sector. This is the immediate post-Snowden world and you can remember what that was like. And back then the metric, and we actually tracked this, was if you had a meeting who would even show up from either side and did either side see any value at all to that conversation?

And the answer frequently at the beginning was no. And we're obviously, we are light years past that now and all the work that both of these gentlemen are doing combined with almost every conversation that you have anywhere in the department right now includes, how are we going to leverage the very best of technology after the problem? Whether we're talking about CJADC2 or barracks. And at the same time on the other side, the commercial tech sector has woken up to the fact that the world that I was living in at the time, too many people that I worked with thought that you kind just turned on your tap and the free and open international system kind of just flowed out of it. And the pipe, I don't know where that came from, but... So we're obviously light years past that.

So if that was phase one of DIU, phase two of DIU was really about proving that you could take a real military problem that was something that the war fighter actually cared about and a commercial technology or commercially derived technology, you could tailor that quickly to come up with a solution to that problem, you could leverage other transaction authorities that we already had but hadn't figured



out how to use, and you could rapidly, in weeks or months, not years, have something that was in the hands of the war fighter and could be fielded and scaled.

And we've now done that many, many times, maybe 60 times or something depending on how you count it at DIU. We've spawned all kinds of other innovation engines around the department, AFWERX is one of the very, very best of those. And so we've done that a lot and that's great, but it's not good enough to get after the imperative that you talked about at the beginning, because what we have to do now is take that capability that we have built together and apply it for strategic effect, which means focusing on a smaller number of things that are driven by the National Defense Strategy, by the JWC, by the operational imperatives that Secretary Kendall has helped put in place, focus on those critical needs and go problem back, not nifty technology out to help to solve those things.

And then to work in partnership from the operator back through the services, both uniform and secretary with the PEOs and with partners across the joint staff and the rest of the office of Secretary of Defense to be able to scale those things so they can actually have that impact and do all of it on the speed that you were just talking about that we've got to do. That's what DIU 3.0 is all about. That's why the secretary elevated the role to be a direct report and that's why I messed up my perfectly good life to-

Lt. Gen. David Deptula, USAF (Ret.):

Oh, great. Thanks for the insight. You get a bit of a follow up too. You recently said, "What we've got to do is we've got to be disruptors on the team and that's about disruption at scale." Can you tell us a little bit about what that means and how you plan to operationalize it?

Doug Beck:

Absolutely. And obviously from the very beginning, the team at DIU has worked really hard to be great teammates and we haven't really been set up in a lot of ways to do that. I kind of think of it that DIU historically was kind of a fiddler crab. We had this one really big claw that was about intersecting with the commercial tech sector and really being at the absolute cutting edge and bringing talent that was dual fluency, spoke both military ease and tech sector ease and could bridge that gap. We had a really strong claw to do that. And then we had this itty bitty little claw that was all about partnering with our partners in the rest of the department. And that's something that we're actively changing right now, and that's about embedding. It's not about old school LNOs, it's about embedding deeply with the operators and with the services in the ways that we need to in order to be fully part of that team all the way out at the problem definition stage, and then all the way back to systemic change stage.

And I'm only on maybe my second or third bounce off the turnip truck here after four months, but with the secretary and the deputy's help and the help of the combatant commanders and the service leadership, we're starting to make some progress against that. So a couple of concrete examples of what I'm talking about. A couple of weeks ago out here at the NDIA conference, Admiral Aquilino announced the new Joint Mission Accelerator, the purpose of which is that directorate's purpose is to help to accelerate the joint fires network, the mission partner environment, store breaker, and also the Pim Tech initiative, as well as others. So it's really to help accelerate the ability to get after those most critical, particularly joint requirements that he's got and that'll be led by somebody, you're reporting directly to him.

The deputy director and CTO of that is an embed from DIU who's out there helping with that. Now it doesn't mean DIU is going to do all that, that means that DIU is going to be at the table helping to see where commercial technology can help us to leapfrog and then teammates to help drive after it.



Recently the deputy secretary announced the new Deputies Innovation Steering Group and Defense Innovation Working Group, without getting into all the details of that, those systemic structures which are designed to help us as a department get after knocking down those systemic challenges to innovation, we at DIU have gone from not being at the table to now helping set the table at the heart of that. And that's the kind of change that I'm talking about when I say we've got to go from disruptors of the team, which is entirely appropriate when you're just trying to be the sand in the oyster at the beginning to wake everybody up, to disruptors on the team, which is about disruption at scale. That's the kind of world that I'm used to from Apple, which is all about disruption at scale, and that's what we've got to do to get after our problem here in the department.

Lt. Gen. David Deptula, USAF (Ret.):

Thanks for that. General Clayton, it's readily apparent that the world today is truly digitally connected. We've heard that throughout this entire conference in a variety of different perspectives. So what best practices or lessons learned from industry do you think can be applied in architecting the CJADC2 mission?

Brig. Gen. Daniel C. Clayton:

Yeah, no, thanks for that question. And this gets back to previous comment about the transformational model. And so some of the baselines that we use in that are straight from industry. So we took best practices from industry on model-based systems engineering using a rules-based approach to performance delivery. And the beauty of this is that, as an operator, I don't speak in ones and zeros, but in the digital engineering environment, you can do that and you can do that easily and transparently across services, across industries, between allies and partners, et cetera. And so specifically it's the SysML or the system modeling language that you're able to use in that environment, it allows us to more easily and more transparently communicate what it is we're trying to do with industry and then also, as previously stated, with some of the other services and some of our other allies and partners. So that is one specific case where we're using that today.

Lt. Gen. David Deptula, USAF (Ret.):

Are there any off-the-shelf technologies that you are finding might be applicable?

Brig. Gen. Daniel C. Clayton:

So I think the one that comes to mind is the SysML immediately that I just described because that has international standards and so it's more applicable. So that's probably the quickest one.

Lt. Gen. David Deptula, USAF (Ret.):

Doug, you want to weigh in on this?

Doug Beck:

Yeah, sure. I'm going to go way back in time and give an example from the 90s and 2000s where there's a lesson I think could be valuable. If you turn on your smartphone and you open up your app for your bank right now, you can access everything about yourself through there and manage all your accounts in one place. And that was sort of the holy grail back in the 90s and 2000s in the financial services world because back then they were operating all of what they did off of completely separate systems. So the people who ran deposits, the mortgage company, the credit card, the lending, all of that were completely separate systems with completely separate databases written in completely different

languages, often had come from different companies that were acquired over time. And a lot of it had been written back in the 70s where there's literally, this is a concrete real example of one from a client of mine from back then, where there was one person who was in their 70s who was the only person who could even read or write that language anymore.

And so they were trying to figure out how could they actually bring those things together to get after the problem. And it seemed like a completely intractable problem. And I think there's some pretty good lessons there because some of it might sound a little bit familiar about the stove pipes that we're talking about, both within services and also especially across services. The first was that, in order to solve that problem, they had to get very, very, very, very clear about the experience that they were trying to create. What was the experience they were trying to create? What's that effectively single pane of glass for a banking customer to be able to look across all of that and be able to do it instantaneously and for them to be able to use that data and understanding to be able to bring the customer whatever they needed to?

The second was they didn't allow one of those systems, the best of them, some of them did and they didn't do very well, the best of them didn't allow one of those systems to eat the others. Joint actually means joint and done in a way that's designed after what you need to do. Now that sometimes might mean the best of each, but it's around a common experience that you're trying to create.

Third, in some cases, they had to actually do what they called good bank/bad bank, which was they would put the right answer on top and have it reach into the databases to do the way they were trying to get after it while they were still having to run that kind of archaic stuff until they really got it right. And that was a process that they had to go through and ultimately led to a gut call about cutting over.

So for us, I think some of the biggest lessons around that are they had challenged the entire basis of what they were thinking of in order to get there, and they were relentless about what they were trying to get to. And so I think we need to be relentless about what we're trying to achieve and not accept all of the layers of why not in getting there.

And the other part of your question about where some of the maybe direct examples might be, one we've already talked about, there's just so much in commercial space that is happening right now very, very quickly that is driven by the relentless demands of going fast, cheap, and in some cases very resilient just through proliferation in commercial space that a lot of that is stuff that we can leverage very, very quickly.

And the other piece that I throw out there is large language models, I hope we get a chance to talk a little bit about AI today, but large language models where some of the things that were intractable back in that 90s and 2000 time I was talking about, they're actually not intractable now because the translation across those different systems is actually a lot easier than translation that your phone can do from English to Swahili and back again.

Lt. Gen. David Deptula, USAF (Ret.):

Very good. Now Dan, another crucial question is just how JADC2 fits into the existing organizational constructs of command authorities. Even if every aircraft, ship, and tank have a common operational picture, there has to be an authority in place to connect that sensor cue to the shooter and actually give the order to engage. So extraordinarily complex issue, I know, but could you give us a little insight on current thinking inside of DOD on this subject?

Brig. Gen. Daniel C. Clayton:



Yes, general. I'm probably not going to bite off of all DOD, but I will say that hypothetically speaking, and this gets back to Secretary Kendall and the operational imperatives, to your point earlier, he challenged us to think differently about how we do things in the future. And the incrementalism, I'll call it, or the status quo or the complacency that we've had in the past may not be good enough. And so we need to think differently about how we do things. And so I'll pose an example, a theoretical example, which is, if a maritime asset can see a track, can an air component asset target it? Or vice versa? And most people in the room will automatically go to, well, yes, of course, we've already done the ones and zeros, we know how to do that. But my point is that we have some doctrinal and maybe some parochial service cultures that need to be broken down in order to solve that.

So if I'm being generous, I'll say that we could probably do that today and we could probably do it in about four hours from one component over to the other. But in actuality, the time required to make that engagement successful would only be about 90 seconds. And so, you're absolutely right, there are some doctrinal and some authority changes that probably do need to occur going forward because, as we talked about at the beginning, the pacing challenges, putting us in a highly contested environment where it's going to take the work of all the components working together very rapidly to make some of these decisions. And right before we walked out, General Cropsey and I got a friendly reminder from a combatant commander that he or she may be one of our harshest critics with respect to not delivering fast enough.

And I'll say, not just at the component level, but at the combatant command level, it's another one where maybe a geographic combatant commander thinks that a functional combatant commander is going to provide him or her something at the drop of a hat, but that may not actually be true because that functional combatant commander also has their plans that they're working on. And so I think at both the component level and at the combatant command level, some of those authorities still haven't been sorted out because up until now, we've kind of been doing things the way we've always done them.

Lt. Gen. David Deptula, USAF (Ret.):

I'd also suggest that that's one of the advantages of a true joint force air and space component commander that we've worked, and it's not just at the functional combatant command level, but it is at the functional domain level that has proved so valuable in the past. So that's something else to add into the equation.

Now Doug, there's been a lot of talk about the role that commercial technology's been playing in Ukraine. Can you talk a little bit about those lessons from a DIU perspective and then what we might be learning that's applicable in the Indo-Pacific?

Doug Beck:

Yeah, so first of all, there are a lot of people here who could probably go a lot longer and better than I could about this, but a couple of lessons from a DIU perspective that I bring forward. I think of it as three big yeses and a not yet, so big yes number one is there have been so many ways that the value of commercial technology is incredibly clearly demonstrated, everything from the leverage of commercial space, from collections to analysis to the ability to crowdsource targeting information leveraging an app from individual soldiers in the field and civilians bring that together and combine it, in many cases with other, including classified forms of information and push it out to help with targeting to all kinds of things that have been learned.

Obviously all kinds of things around unmanned systems, all kinds of stuff that's been demonstrated clearly that we can learn from this and we can find asymmetric capability from those requirements that



can make a difference against a large competitor, alongside all the more traditional forms of force, which are really what's going to move the ball. And that's most of what's happening in Ukraine right now is 155. So that's point one.

Point two is that we can often move a lot more quickly with commercial technology with a partner than we can with something that we may have ourselves. So sometimes it's easier for us to say, "Hey, it might take us a while to take this capability that we have that may be classified," or maybe it's not even classified, but it's restricted in other ways, "and get it to you. But hey, you might want to talk to these guys and buy that thing and think about how you might do it," or, "You might want to talk to this other third-party country and they've got something in one of their commercial technology companies that you may be able to leverage." And so there's a huge opportunity there in using commercial technology to go very, very quickly with partners. And this is something that you can think about that for Ukraine, think about it for partners in the Indo-Pacific as well.

Third piece is that it's not just about the technology itself and getting it in the right hands, it's also about the people. So one of the things that we've learned a lot about is just the value. And this is something, whether it's from DIU or others across the innovation ecosystem, Air Force and others, where we've had our people out there working with the team in Ucomm with the team at SAGU to help ensure that the problem's getting solved.

And sometimes that's about new technology, but sometimes it's just about using the technology that's there and thinking creatively about how we're going to solve the problem together to go get after it. And the value of that, which comes back to that point about embeds has just really, really come clear. So those are the big yeses.

The big not yet is all of that is awesome and none of it is at the scale of impact that we need in order to meet our challenges, whether that's the challenge of deterring Russia at scale in Europe or the challenges in INDOPACOM. And that matters for us, the scaling matters, so for example, some of those companies I talked about that are delivering all that great value in Ukraine, some of them had to lay people off at the same time because the scale's not there. That matters for us. We don't get the impact we need without the scale. Sometimes scale is lots of things. Sometimes scale is lots of people using a thing. And the companies that are delivering this don't get what they need for the circle to square from a return on investment perspective unless that scale happens too. We got to make both those things happen in order to get to where we're going. That's a big part of what we're focused on now.

Lt. Gen. David Deptula, USAF (Ret.):

Well, thank you. For both you and Luke, artificial intelligence is often described as a very opaque black box, making it difficult for an observer to see how it arrives at a particular conclusion. How can we mitigate this challenge when implementing AI for JADC2 and while we're able to still reap the benefits from AI? There's a trust piece to this also.

Brig. Gen. Luke C. G. Cropsey:

Yeah, so I think we have to be clear about what we want it to do. I think sometimes, again, we talk about AI in the abstract, it's going to be out there and right, we're going to live under Skynet at some point. But I think really when you look at it and the actual AI panel that was earlier in the week was really good on this. I think if we don't understand AI as trusted tools that we use to get useful things accomplished, then what we end up doing is we end up talking about it again in the abstract. And so from my perspective, it's pretty simple, right? I have to be able to connect things, I have to be able to expose the data, and then I have to be able to exploit it.

AI can help me connect things that I may not be able to connect otherwise because there's too many moving pieces to do it with a human operator in the loop. AI can help me expose the data that I need to make the decisions associated with the outcome that I'm looking for, if I understand what that decision is and the data that's required to do it and it's connected. And the third piece is once I have that data available, that AI can help me actually parse through that data, find the pieces that matter to me to make the decision that's at hand. So for it to get trusted in that context, I think we have to actually neck down the use case to the point where a human brain can look at the results that are coming out of it and say, "Yeah, I can actually understand where and how I got to this point." And if we don't get specific around what that looks like, I don't know how we get to the trust factor.

Doug Beck:

Yeah, first of all, I would agree completely with that, with everything General Cropsey said. And I actually would reinforce even further by saying, when I talked about how much things have changed since the origin of DIU, back then there's no way that a general officer would've been sitting up here talking with that level of sophistication about the problem of AI. So that's exactly a reflection of the change that's already been made.

I might just add a couple of thoughts. First of all, AI is one of those words that you can go around sprinkle AI dust magic on everything right now, and that's great. Maybe drilling in on an example of that, large language models, generative AI more broadly. It's a great example of this. I like the way Craig Martell talks about this, CDAO, as kind of a lab leak. There's still a lot of issues out there with hallucination, with toxicity in those models that the private sector's still trying to figure out and academia is still trying to figure out.

And so in the commercial world, there's an incredible amount of excitement, but among the most mature and responsible of those companies, there's also a lot of thought that's going into, where can we use these tools and where not? And there's an analogy to that for us because there's some places where being at 98% or 85% even accuracy on something, but doing it enormously fast across a vast array of data is very helpful to that human operator to be able to make a decision more quickly where the human operator, by themselves, would be too slow or maybe be at only 70% accuracy. But there's lots of other places where you've got machine to machine speed and maybe you just can't use it right or you might be at risk of making the wrong kinds of decision about lethality that you just can't make.

So, this is all about that. It's all about what data you're using to train the model and it's all about what use case you're talking about. So my counsel on this would be that we need to press hard and don't be afraid, but also don't give into the hype. And let's be thoughtful about execution.

Lt. Gen. David Deptula, USAF (Ret.):

Okay. Flexibility is a key to success. Fastball pitch closing. 15 seconds. Final thoughts? Luke.

Brig. Gen. Luke C. G. Cropsey:

We got to deliver capability continuously. The old model about plunking stuff out every five to 10 years isn't going to work here. So we have to get after incremental continuous delivery and we're getting after it.

Lt. Gen. David Deptula, USAF (Ret.):

Doug?



Doug Beck:

You want to go next?

Lt. Gen. David Deptula, USAF (Ret.):

Are you going to go with Dan? Okay, Dan?

Doug Beck:

I'll go last.

Brig. Gen. Daniel C. Clayton:

All right, sounds good, sir.

Doug Beck:

Give me 10 more seconds to think.

Brig. Gen. Daniel C. Clayton:

I'll just say that I encourage everyone in the audience to read the most recent publication of Mission Command. This falls in line with how do we do things differently? How do we think differently? And everyone in the room needs to be empowered to think differently about how do we tackle this pacing challenge? And I'll close with how I started, which is the Department of the Air Force is actively modernizing command and control for decision advantage today.

Doug Beck:

I'd maybe close with one thought, which is I came home from Iraq and Afghanistan about 16, 17, 18 years ago, 16 years ago, and one of the things I realized right off the bat was that what I had learned through my private sector career about risk was wrong. Most of what I thought of as risk was actually uncertainty. And real risk is something different. Real risk is what we all are dealing with, is what you all deal with all the time.

And we have to be very, very, very careful that our very smart, well-meaning actions to manage risk, real risk built up over many, many years of risk mitigation, don't inadvertently have us transfer that kind of risk, risk to process, risk to money, risk to somebody getting mad, risk to all kinds of stuff, don't inadvertently transfer that kind of risk into real risk. Real risk means strategic risk down the road and it means real risk to the Airmen, Guardians, Sailors, Soldiers, Marines, and Coast Guardsmen who are going to be in the threat if we end up in that spot. So that'd be point. And point two is one word, which is teamwork.

Lt. Gen. David Deptula, USAF (Ret.):

Okay. Well thanks very much, gentlemen. Please, audience, join me in thanking our panel.

And from the Mitchell Institute, have a great air and space power kind of day.