Responding At The Need Of Mission Speed

The JAIC — Joint Artificial Intelligence Center — is working to reduce AI barriers so DOD can actually implement AI capabilities with less effort and less cost.

Over the past two years, there has been a change in the mindset at DOD with respect to AI.

The types of arguments made in the past about were about whether or not AI was important; and whether or not now was the right time for DOD to be accelerating the adoption of AI.

That discussion is essentially over. The leadership of the Department by and large "gets it"; and that's true in each of the services, that's true in the combatant commands and that's true in the Office of the Secretary of Defense.

And it's just one illustration of the prioritization that the Department has put on AI.

My own organization — the Joint Artificial

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Intelligence Center (JAIC) — was elevated to be a direct report to the Deputy Secretary of Defense — the number two person for the entire three million plus department.

Accelerating ADA

DOD is moving from one-off types of projects that demonstrate and illustrate the capabilities of AI towards thinking about what are the technical barriers that make adopting AI difficult. Further, how do we make those barriers reduced so that more folks can actually implement AI capabilities with less effort and less cost?

At the JAIC, we are doing two specific things to reduce the technical barriers and accelerate AI.

The first exciting opportunity is the Accelerating Data and AI Initiative or ADA that began in June 2021.

We recognize as we're developing more AI enabled capabilities in our research institutions and our program offices, concurrently we also need to be modifying the infrastructure and approaches at the combatant commands so these capabilities can more quickly and effectively be integrated.

That gives us the capabilities to ensure that different data sets coming off the real diversity of technological systems that exist in the combatant command can effectively share data.

And make that data available for machine learning algorithms that improve their performance as they're exposed to more and better quality and more diverse data sets.

So ADA is a really exciting initiative that the JAIC is leading but is really involving the activities of so many different organizations across the DOD including the CIO, the CDO and the combatant commands themselves.

Joint Common Foundation

Secondly there is the Joint Common Foundation which recognizes that cloud first software systems really need to be born in a cloud-enabled environment that enables what we call the Dev/Sec/Ops approach.

This is a different mindset because cloud first software is delivered as a service unlike traditional software systems in DOD where you might burn the software onto CD-ROM, install once and then forget about for the next five years.

Gregory Allen spoke at the Federal Executive Forum on Federal News Radio

The good news is that mindset is really being erased across DOD.

The Joint Common Foundation is a software development environment that includes, not only all of the best practices and tooling that software developers have come to expect in commercial industry, but also some of the secret sauce capabilities that AI and ML software in particular needs.

We hit initial operating capability at the beginning of 2021 and we've now on-boarded programs from each of the armed services. People are actually finding that developing AI capabilities when you do it in the Joint Common Foundation you have a faster and more effective path to getting the capabilities into the hands of your end users and then iteratively updating those systems.

AI/ML-enabled Cyber Defenses

Working in partnership with US Cyber Command and others we are using AI for cyber intrusion detection and for network analysis and anomaly detection.

The amount of cyber data flowing through a network at any given moment is extraordinary. Most of the activity follows somewhat regular patters, but there is also the occasional blip that looks different from other types of things. In traditional software you would create a rule that says that anytime something comes in looking like this flag it for human review. And that would be a traditional software approach.

But with AI and ML you don't necessarily have to tell the cyber system this is what I'm specifically looking for to execute this rule in order to find those sorts of things. You can just give it examples of anomalies and it will come up with the rules by itself for the best way to detect those; that's in a supervised ML environment.

There's also unsupervised ML where it can just say I have analyzed all of your data and here are the parts of your cyber network data that look the least like traditional traffic patterns or traditional user activities.

That really helps accelerate speed and efficacy of our cyber warfighters and our cyber defenders because they don't have to actually go through and manually review all of this stuff. The AI systems can identify and prioritize what they should be working on in a given day by saying: This is the stuff that looks most interesting so start here.

AI Evolution

We are evolving from an era in which AI is difficult to implement and requires a great level of expertise. We are moving quickly into an era into in which an AI is an expected aspect of your daily life whether that's in the business enterprise of DOD or whether that's actually in warfighting operations.

For example, on the business side, the budget, financial and contracting data of DOD look like phone book thick reports. If you want to understand and analyze that data you have to read hundreds or thousands of pages of documents and in some cases as with contractor, millions of documents.

So we actually partnered with the Navy to create a new capability which uses ML and natural language processing which is a subdomain of ML. Now we are going to be analyzing the budget data and contracting data so you can actually move from a report you have to read to a cloud enabled application that you can query and search from.

> We are moving quickly into an era into in which an AI is an expected aspect of your daily life.

For instance you could reach into the 60 million contracting documents that DOD has executed over the past decade or so and you could say "show me all of the contracts that look like this one?" That is a very different relationship between information that a typical analyst or typical user will have in the future than the one they have today.

Not only will this performance be incredible but it will be continually updated. In working with the Navy's Advana team, when I have said I need the system in development to have this capability or feature, they come back to me the next day, the next week and it's already upgraded to be what we need the system to do.

That is a totally different relationship that DOD organizations used to have with the creation of software enabled technology. This used to be years-long development efforts, but now we are totally revamping our data infrastructure and our software development infrastructure so that it can respond at the speed of mission need. ■