Ep.121 Demystifying AI for Military Commanders

Judith Kelley [00:00:00] In 1801, the inventor Eli Whitney, demonstrated his newest innovation for the top military brass, along with US President John Adams and Vice President Thomas Jefferson, and his invention was interchangeable parts for muskets. And that innovation was extraordinary. It seemed to have huge potential. I'm going to read from an article that my guest wrote. Prior to Whitney's miracle musket, firearms production was a highly skilled endeavor requiring the labor of a trained, experienced craftsman. Each musket was custom built with brittle parts. It was almost like a piece of art. These custom weapons were expensive and unpredictable. Commanders and soldiers had no sense how effective the weapons would fire. Straight, sideways, not at all, or how many would fail during battle. If the weapons broke on the battlefield, there was no easy way to fix it without a skilled craftsman's hands. And if a weapon catastrophically malfunctioned, the soldier was out of the fight until a weapon could be taken from a fallen comrade or vanquished foe. So you can imagine the room on the president- on the presentation day. That was a lot of excitement. There was only one issue Whitney hadn't actually made the so-called miracle musket. Instead, he used secretly premarked pieces to assemble into different muskets to give the illusion that he had. But his audience, and I'm reading again, the audience was none the wiser between Adams, Jefferson and any number of military leaders in the audience. Not a single one of them knew the right questions to ask Mr. Whitney. They fell for the ruse. They were betrayed by a desire for innovation, next generation weaponry and a pressing need for new technology to help a nascent US military prepare for war. Alas, it was all a farce to win a richly priced government contract. And it worked. So let's fast forward a couple of centuries and we've come so far from muskets. Now, artificial intelligence and machine learning provides a similar allure and a similarly steep learning curve as Eli Whitney's innovation. How then do current military commanders avoid the same fate as the Adams administration? And what kinds of questions do we need to be asking? How do we know today how to ask the right questions? My guest today is part of a team that has devised a plan to demystify aspects of A.I. for current military commanders and arm them with the right questions to ask to distinguish A.I. with real enduring capabilities from so-called, quote, drive by A.I., unquote. Marc Losito is an MPP student here at Stanford, where he is a Carlucci Fellow in Security Studies. He's also a warrant officer in the U.S. Army. Welcome to Policy 360.

Marc Losito [00:03:16] Thank you for having me.

Judith Kelley [00:03:18] So in your article, you tell this wonderful story that I've just recounted about Eli Whitney and then you ask a question about how modern day commanders understand the underpinnings of A.I. and do they understand it well enough to spot the A.I. hucksters and charlatans of today. So what's your answer to that?

Marc Losito [00:03:41] Well, I think that with the advent of any new technology, there's a certain amount of mystique surrounding that tech that can be somewhat intimidating. And I think the the point of the question is to get to get at that mystique and propose a set of questions that can prompt a discussion. It's not going to prompt a an expert level of of domain knowledge, but it does put the commander back in the driver's seat for developing these these new technologies.

Judith Kelley [00:04:20] Is is your primary concern, Marc, here, whether the technologies are going to be functional and cost effective, or what is your primary concern, like, what what dimensions are we optimizing on here?

Marc Losito [00:04:34] Well, I think I break it down into three different dimensions in the A.I. smart card or the set of questions that we're getting at here. What the A.I. smart card aims to do is frame three dimensions of of A.I. and really any new technology. And it's how we think about it, how we acquire it and how we develop it. And in the context of A.I., how we think about A.I. and it's hidden in the byline of the title is that A.I. is the commander's business and that even though it's this new technology with a certain amount of mystique and and it is certainly complex and intimidating, it's not so complex that we have to relegate ir to engineers business. Command- commanders need to be driving the use case for these A.I. programs. They need to be driving the requirement and they need to be involved in the development. Which goes to my second point. We need to reframe the way that we acquire A.I. and software for that matter. Like I mentioned, the use case belongs to the commander and A.I. and software are, need, they need to be acquired differently than battleships and aircraft carriers. It needs to be done quickly. It needs to be done in partnership with the commander. It needs to be done iteratively, which is the third thing that we try to reframe is how we develop A.I. It must be an iterative and constantly evolving development process that focuses on the core (unintelligible) of A.I., which we propose is data, algorithm development, compute, testing and evaluation, and then deployment on an AI ecosystem.

Judith Kelley [00:06:25] So give us an example of what we're talking about here, Marc, what is an example of an AI driven invention in the military that would be relevant to this conversation?

Marc Losito [00:06:38] So the most mature would be, in my opinion, would be computer vision or object detection. And in the in the the the the joint operational areas of Afghanistan and Iraq, we are flooded with imagery and full motion video coming from our drones and our manned aerial platforms, and it takes and it takes an inordinate amount of highly skilled and highly trained humans to analyze that data. And so that's that that sort of frames this discussion of Eli Whitney and these highly skilled craftsmen for for these for the for the brittle muskets. And so what the Department of Defense has done is developed a computer vision object detection algorithm that uses A.I. to identify objects on this full motion video at a rate and pace that humans are unable to match. So it enhances our decision making process. And I make that point to say that it enhances our decision making process and to differentiate it from replacing our decision making process.

Judith Kelley [00:08:01] Right, right. And by even differentiating between enhancing and and replacing there, you are getting into ethical questions. Right. And so. Here, this seems like a rather sort of benign use, you've got processing of data that can be much more efficient and is presumably, once decision time comes, enhancing, which means there is some human input before that, before decisions are made. Right.

Marc Losito [00:08:33] Right.

Judith Kelley [00:08:35] So that seems that seems like a straightforward efficiency enhancer. But today, for example, we had the Human Rights Watch call for Congress to completely ban the use of autonomous weapons. So what you were talking about is a vision capability that's not necessarily itself a weapon. Would your smart card also be, do you think, complete if we want to think about things like robots fighting other other forces?

Marc Losito [00:09:16] I think that's certainly a dimension that, you know, is, I'd say missing, but it definitely could be added. So the ethical considerations and I give an example, one of the A.I. enabled enhancing systems that we use that fall into the

autonomous weapons category are the object detection firing systems on Navy ships that identify incoming missiles that could potentially sink that ship.

Judith Kelley [00:09:49] Right.

Marc Losito [00:09:49] They identify it using radar and forensic metadata, and then they they engage that target at a speed that a human just could not engage in, which puts the ship in between life and death. So I think that a dimension that could be added to this smart smartcard are the ethical considerations for the use case and and I circle back to the use case because the use case should be the driving force or the driving component for each development cycle of A.I. and it has to start with the commander. And the commander owns the ethics of that application as well, at least in the military.

Judith Kelley [00:10:40] Explain the term use case.

Marc Losito [00:10:43] So use case is the driving proposition for developing A.I. So I would start with a story from an operations officer in a deployed environment where when when given an example or a proposal for what A.I. could do for this for this person on the modern battlefield, the response the response was you're trying to sell me a flying car and I need you to solve the simple problems, what we commonly refer to as pain points. Our operational forces overseas traditionally have solved hard problems through brute force and ingenuity. But as data becomes more prevalent and we're almost drowning in this trapped data that's inaccessible and we have to mine it ourselves and we have to go through tons of emails and chats and FMV or full motion video and drone footage. These are the pain points that drive the use case that says, you know, wouldn't it be nice if A.I. could achieve object detection of vehicles and people so that we can provide a level of scrutiny to our highly trained humans and make decisions faster or a use case of wouldn't it be nice if we could compile collateral damage reports or civilian casualty reports with a greater accuracy and precision that could enhance our reporting to Congress potentially?

Judith Kelley [00:12:29] Mm hmm. So I think there is an important case to be made, Marc, here for for A.I. in the military. I imagine that that initiatives like the one by Human Rights Watch are largely driven by fears that there is going to be machines making decisions about when to kill people. But so much of what you're talking about is not about that. It's about so many other decisions on processing that would allow our forces to operate more efficiently, perhaps sometimes more safely. And so I think that's that's worth noting.

Marc Losito [00:13:08] No, you're absolutely right, and I point back to the national defense strategy and this phrase that we use throughout the article, which is called the lethality of the joint force.

Judith Kelley [00:13:23] Right.

Marc Losito [00:13:23] And it's it's as we discussed, it's easy to interpret that as our ability to apply violence on a massive scale.

Judith Kelley [00:13:35] Right.

Marc Losito [00:13:36] But the illegality of the joint force, the notion in the national defense strategy is about increasing the lethality of the joint force in a strategic deterrence theory application is that if we can harness this massive amount, this insurmountable

torrent of data, that we would have to leave on the cutting room floor. If we if we can somehow utilize that to make better and faster decisions, faster than our enemy, then we will not we will have the option to we won't have to apply violence. We will we'll have a strategic or a competitive advantage that gives us other offramps or other options.

Judith Kelley [00:14:24] Mm hmm. So so let's presume for a moment that going back now to the the charlatan lede of your article, which really is about accepting the fact that A.I. can be usefully applied in the military and that there are applications we want to invent and acquire you raise this problem, you call, quote unquote, drive by A.I. How is drive by A.I. different from the real thing?

Marc Losito [00:14:57] So drive by A.I. is exactly what Eli Whitney provided to President Adams and Vice President Jefferson. It is this this this single use case, quote unquote, demo, where this, this illusion that is created only for the purposes of demonstration and it doesn't actually go far beyond that, and that is that is the crux of the issue, is that we have to know the questions to ask so that we don't mistake drive by A.I. for real A.I.

Judith Kelley [00:15:36] Mm hmm. Mm hmm. I mean, this is a problem that that arises in other industries as well. You know, most recently and in in the Silicon Valley, we've had in the health care industry cases of invention of products that turned out to be fake. How big of a problem is that in the military?

Marc Losito [00:15:58] Well, I think... I don't know to what extent or scale it's a problem, I do know that it it is. I've witnessed it. And that was really one of the driving factors about why we me and my coauthors, we wrote this article is because we have seen this happening in real time. A.I. is being developed in a bunch of different places within the Department of Defense and I think this also goes to private industry as well as the larger government. But it is being developed in a bunch of little pockets and sometimes those little pockets are iterating with the users on the battlefield. Sometimes they're not. That's that's a big issue. And sometimes these pockets that are developing, A.I. have an overreliance on what we call beltway contractors, you know, vendors, vendors that make a living on delivering quick capability to a set of requirements that sometimes, all in all, doesn't answer the commander's question. But, you know, we're still we're still paying for the product, if you will.

Judith Kelley [00:17:16] So so help me understand a little bit more what the problem is, right? Because if we go back to the musket example, you know, presumably at some point they realized there is no sort musket, such musket and and a contract either was voided or there was some kind of criminal punishment or some kind of follow up. I don't know the historical case, but especially if you're a beltway operator contracting regularly with the U.S. government, it doesn't take a lot of fake products before your credibility is shot. And they may even be a fraud and other charges held against you. So is the problem that? That that is disruptive to the military's planning, or is it that we don't hold people accountable? Or is the problem that we're just developing the wrong things that don't actually solve our problems, which is that the flying car problem? What really is the problem here?

Marc Losito [00:18:20] So I think it's the latter, and I think it's a combination of a couple of different things but the first is that in, in some cases the vendors are in the driver's seat. They're telling commanders what they need rather than commanders or battlefield users, telling the vendors what's required to win this conflict.

Judith Kelley [00:18:43] Right.

Marc Losito [00:18:43] And so it's this it's this reverse requirement cycle where it's have solution. Need problem.

Judith Kelley [00:18:51] Yes.

Marc Losito [00:18:52] And that's that's challenge number one, which is why we say that A.I. is commander's business and we need to put them back in the driver's seat. And there's a there's a second dynamic here, which is the traditional Department of Defense requirements process or the acquisition process.

Judith Kelley [00:19:11] Right.

Marc Losito [00:19:11] And this is this has been talked about ad nauseum by several different academics and professionals. But generally, the Department of Defense adopted a requirements and development process back in the 1950s and 1960s when we were spending hundreds of millions of dollars on aircraft carriers that that took years to build and took, you know, that we needed sort of a scale concept so that we could, you know, acquire several of these aircraft, these large end items, if you will.

Judith Kelley [00:19:47] Right.

Marc Losito [00:19:48] A.I. is not that. And A.I. can't work inside of that requirements and development cycle. A.I. evolves faster than the problems evolve on the battlefield, which which is, which is a, which is a paradigm shift from how we've reacted to our enemies competitive advantage. And there's this sense that there's been a shift in how requirements are communicated, how they are developed and how they're evolved. In the past, in the 1950s and 60s, when this requirements process was was birthed, there was there was no need for a constant feedback loop...

Judith Kelley [00:20:35] Right.

Marc Losito [00:20:35] ...in a five year process. But with A.I., the feedback loop is near constant. And the ability to change based on that feedback loop in A.I. is also near constant.

Judith Kelley [00:20:50] So, Marc, how much of this is is a political problem? How much of this is is inside contracts, lobbying for contracts from from developers who have sexy products that nobody's actually asked for? And how much of it is a problem of the military not actually being able to communicate what they need and have an audience for that? What is the what is the issue then?

Marc Losito [00:21:21] Yeah, I think you've struck a pretty decent chord there that it is it is a it is an issue. I I've talked to some of the leading intellectuals on this this issue with our defense acquisition and requirement system. And there needs to be a change. You know, A.I. portends a capability that can't be developed in three to five year cycles.

Judith Kelley [00:21:51] Mm hmm.

Marc Losito [00:21:52] Like like like like a like a ship or a weapon system of old. And there actually there has been some movement in Congress on this on this issue as well as

in academia. There has been some movement on illuminating this issue and the challenges that it presents for modern technology, particularly A.I. and software.

Judith Kelley [00:22:17] Mm hmm.

Marc Losito [00:22:18] But there's also a challenge within the military itself, you know, in what I believe Eisenhower would have referred to as beware of the militant military industrial complex.

Judith Kelley [00:22:34] Right.

Marc Losito [00:22:36] And the stranglehold that it puts on capabilities. And so there's there's a it's two-sided, if you will.

Judith Kelley [00:22:43] So the problem is not actually unique to the military, right? The problem is across the board, when we start to think about fast developing technologies and the fact that you can you can get paid so much more to work on the technical end of development and product development than you can working for the government or military on the receiving end, understanding what questions to ask. And I think we have a similar problem when it comes to development of medical devices, to social media regulations, in terms of deep fakes and other things like that. There's, technology is is moving at a rapid pace and policymakers, policymakers don't have the the knowledge the know how to know which questions to ask. So that's partly, a you know, an ethical question, but it's also a policy question. And then, you know, you pair that with an actual conversation about what do we need? And those are sometimes at odds with each other.

Marc Losito [00:23:49] Yeah, I think all you have to do is look back at one of Mark Zuckerberg initial testimonies to Congress. And there was a representative that asked him, well, if Facebook doesn't charge for its services, how does it make money?

Judith Kelley [00:24:03] And Zuckerberg answered, We run ads, Senator.

Marc Losito [00:24:07] Correct, correct. And so there is a fundamental fundamental misunderstanding...

Judith Kelley [00:24:12] Yes.

Marc Losito [00:24:13] ...about technology. And I think that this article, while it doesn't say policymaker, while it doesn't say industry leader, I think that the the questions or at least the framework for the questions that we propose transfer to some extent to the three different areas of decision making, whether it be policy, industry or research and development or academia. And I think that the ethical component is is important. I also think we are in a new era of research and development. And what I mean by that is previous, A.I. has gone through these boom and bust cycles, the hype and sleep cycles of development and, you know, a new technology or a new component technology comes out and there's a sugar rush or a fever pitch for what what what this new capability could do. And we pour lots of money into it. And, you know, we we develop it as far as we can go, but then we reach the limit of technology or the component technology and we fall into an A.I. winter and and that cycle continues. And it's continued about once every 10 years since the 1950s or 1960s. And we're at a point now where our limitation is not technology. Our limitation is a human problem now. The limitation is understanding its domain expertise, is it's the Eli Whitney problem. And we've got to be able to get out of our own

way to develop A.I. and software to respond at scale to the challenges of national security, but do it in an ethical manner, as you brought up.

Judith Kelley [00:26:11] Right. And the Eli Whitney problem truly is not that there are charlatans out that the Eli Whitney problem is that we don't notice. We don't know enough to spot them or ask the right questions, and that applies, unfortunately, not only to products that might that might be fake, but also to products that might be real.

Marc Losito [00:26:36] Right. Correct. Yeah, I think that's that that speaks to, you know, real products that solve real problems, but don't answer the right question.

Judith Kelley [00:26:48] What what do we need to do to make sure commanders have a better handle on these things? Do we need to have education programs or what do we need to do? Of course, they could just pick up your smart your smart card rubric there, but might we need to do a bit more?

Marc Losito [00:27:09] Yeah, I think I think you're right, you know, the in the military, ethics, the ethics issue belongs to the commander, so does so does the requirements, the initial requirements process, the requirements process is reliant on battlefield users to relay the realities of the problem. But there's also this this middle ground, which is the development peace and the the short answer is that we need to overhaul our development processes so that commanders and battlefield users are more integrated into this iterative spin cycle of fielding capabilities.

Judith Kelley [00:28:01] Marc, this just sounds like a incredibly complex issues. You know, we have you and I have spoken about, you know, legislation, policy, ethics, the hardware, you know, different commanding roles, et cetera, et cetera, politics. There's just so much going on here. You've been a student now at Sanford working on your master's master's degree. And so how has being able to step back and and and pick up some some skills and tools helped you think about this problem and helped you write an article like this?

Marc Losito [00:28:43] So first, you know, this is an incredible opportunity to attend Sanford School of Public Policy while on active duty. You know, one of the benefits is that while I am in fact, on somewhat of a sabbatical, I'm able to shift my perspective. I'm able to look through a couple of different lenses where as before, I was a user of these technologies. Now I can look at it from several different perspectives, from the Pentagon's perspective, from Congress's perspective, the executive branch. But also I can look at it from the public perspective and consider privacy issues, transparency issues, and all of those get to the complexity that you just mentioned, where, you know, when you are on this constant deployment cycle or rotational cycle to deploy, you're more concerned with how can this A.I. help me do my job better?

Judith Kelley [00:29:50] Right.

Marc Losito [00:29:51] And you're not thinking of the second and third order implications, the ethical, the human rights, the data privacy, the public scrutiny or public controls. And this is really giving me an opportunity, not only just with A.I., but because I'm focused on national security and technology writ large. It's it's helped me zoom out my perspective and take on a couple of different frameworks of thought.

Judith Kelley [00:30:25] That's fascinating. Marc, I'm really glad to hear it, because, as you know, at the Sanford School, we have a pretty steady participation of people on active duty, people in the national security arena, in our educational programs. And so, matter of fact, we're going to launch a new mid career program in national security policy, partly because it's exactly the conversation we're having today, right? It is it is so important that people who are protecting our nation and who do have our our best interests at heart have the skills and the tools to be able to think more broadly about the implications of their actions and activities. And so I'm really glad that it's been helpful to you, Michael Losito is a master of public policy student here at Sanford School of Public Policy at Duke University, where he is a Carlucci Fellow in Security Studies. He's also a warrant officer in the U.S. Army. We'll have a link to his article on our website, Policy 360.org, and we'll be back soon with another conversation. I'm Judith Kelly.