



Applying Agile Principles in the DoD: Fourth Principle

featuring Mary Ann Lapham and Suzanne Miller

Suzanne Miller: Welcome to the SEI Podcast Series, a production of the Carnegie Mellon [University] Software Engineering Institute. The SEI is a federally funded research and development center at Carnegie Mellon University in Pittsburgh, Pennsylvania. A transcript of today's podcast is posted on the SEI website at sei.cmu.edu/podcasts.

My name is Suzanne Miller. I'm a principal researcher here at the SEI. Today I am pleased to introduce to you to myself and to Mary Ann Lapham, a principal engineer here. Welcome to [our ongoing series](#) exploring agile principles and their application across the Department of Defense.

In today's installment we explore the fourth agile principle which is, *business people and developers must work together daily throughout the project*. But first, a little bit about ourselves, the guests for today.

[Mary Ann Lapham's](#) work focuses on supporting and improving the acquisition of software-intensive systems. For Department of Defense systems, this means working with the program office to assist and advise on software issues at the system or segment level. In addition, she performs research into software topics that are germane to acquisition of software-intensive systems. Right now, she's focusing on researching, adoption barriers to agile methods in the DoD and government. She is the lead of the SEI's initiative in that area.

[My research](#) focuses on synthesizing effective technology transition and management practices from research and industry into effective techniques for use of agile and lean methods in regulated settings like the DoD. I work with Mary Ann on the agile adoption in DoD project.

This is our fourth podcast about agile principles in Department of Defense settings. If you like what you hear today, there are already three podcasts in [this series](#), and we will eventually have 12, one for each agile principle behind the agile manifesto. As a reminder, the four values and 12 principles of the Agile Manifesto can be found at www.agilemanifesto.org. Okay, Mary Ann, let's talk about what—*business people and developers must work together daily throughout the project*—means in a DoD context.

Mary Ann Lapham: Well, first off, Suz, who are the business people in the DoD?

Suzanne: Isn't that the crux of this one.

Mary Ann: Well, depending who you talk to. Years ago when I was supporting acquisition, there was the users, the guys out in the operation field. They thought they were the end user and they were the guy we were doing it for. Then there are the guys who acquire things for those people.

Suzanne: And pay for them.

Mary Ann: And pay for them. And, they thought they were the users. So, it was really confusing when you got those two groups together with the contractor to decide who's really [the business people]. There was a lot turf battles.

Suzanne: So, in the context, to take this back, the agile manifesto was written in the context of more commercial businesses.

Mary Ann: Yes, most definitely.

Suzanne: So, from their view point, *business people* are essentially the marketing people that understand what the market is, what market they are trying to penetrate. It's the end users who are actually going to use the product. So, they are looking at business people in a little different way than we do in the DoD. So, they don't necessarily have quite that same difference between *he who pays for it* or *she who pays for it* and *the person that's using it*.

Mary Ann: And, the thing is with the DoD environment, you obviously have to have the acquirers because those are the people that are trained to do the acquisition. And, they have the warrants, if you will: the permissions and the legal authorities to do it. However, they need to be working with the end users. And, typically, in a traditional environment, they do. They go out. They gather all the information from all the different end users, and they can be multiple groups. Of course, they all have different needs. And, so, the acquirers will go out and get all the information. Consolidate it. Let the contract, get the product, and then give the operational thing to the end users.

With agile though, you don't just do it once. Agile is an evolving learning environment. So, you have the top-level requirements. But, then, as you evolve and learn more about it, different requirements will emerge. And, you need to verify those with the actual operational end user.

So, you don't just need the acquirers who have the warrants and all that to do it [create the product]. You still have to have some kind of access to those end users, [who are] operational types.

Suzanne: And, it's not just a—one-time, come-to-a-user workshop and go home—for the end users.

Mary Ann: No, no.

Suzanne: So, in the army for example there's an organization called [TRADOC \[United States Army and Doctrine Training Command\]](#). Training and doctrine is what that stands for. Those folks, that's what they do all day long; go out and interview users and try and find out what's going on. But, they don't often get to have a lot of interaction with the acquirers. You know, *thank you very much TRADOC. Okay, now we're going to build something.*

So, in an agile environment, we would expect some different relationships between organizations like that, or other ways that people get surrogates for the end users, who are the ones that really know what they need the application to do when it comes right down to it.

Mary Ann: Right, and one of the problems with that is—*Okay, we know we have to have the acquirers.* So, those guys are readily available because that's their job.

But with the staffing model you have in—I'll use the Air Force because I'm most familiar with them—they have the operational guys, but the operational guys and the acquisition people are two different basically...

Suzanne: Two different commands.

Mary Ann: Two different commands. Sometimes you'll get somebody who is in operations and gets assigned to that acquisition and sometimes the other way. Usually not, but you do. But you need a little bit of both. If you're doing an acquisition and you want an operational guy, that's almost impossible in today's environment unless you plan way, way ahead to have access to those folks. It presents a dilemma when you're trying to use agile methods.

Suzanne: Well, and especially, this principle is saying business people and developers work daily.

Mary Ann: Yes daily is a problem.

Suzanne: And that's the thing that, you know, that you're talking about. It isn't just one time I'm going to go out to interview this guy. It's *I need to have access to you on a daily basis to answer questions, to look at what I'm doing. Every two weeks at the sprint review, I need you to be there to tell me and give me feedback on the software.* So, this is a really different mode of working.

I know, you and I have seen at least one example of how this works. Do you want to describe that for us?

Mary Ann: Well, actually, I've seen a couple of others, but the one that you're talking about is within Air Force Program called Patriot Excalibur. They have 600 some different deployments around the world. So, they have all these different users, but they all have a similar kind of need. But, they can't get somebody into their office that's a user.

Suzanne: And they don't want 600 of them...

Mary Ann: No, they don't. Well that would be kind of interesting. They would probably have fun. They do invite all 600 to a conference every couple of years, but that's probably gone by the wayside now.

Suzanne: But, that's not daily.

Mary Ann: But that's not daily. So, they had to figure out a way to fix this problem. What they have done is they've hired current retirees; people who had just came out of that field that know exactly what's going on and still have a lot of ties back to the guys that are still on active duty.

And so, they have the communication fast. They understand some of it, and then they can go out and say, *So, Joe, remember when we did that? Do we still do it?* And they'll find out, *No we don't.*

Suzanne: *We don't do it that way anymore.*

Mary Ann: *We don't do it that way anymore. And, boy, would it be nice if I could this, this, and this.* And they're like, *okay.* And they bring that back, and they use that as part of the fodder for the backlog.

Suzanne: So, they actually have these people that are full-time staff.

Mary Ann: Full-time staff.

Suzanne: They have what they call a systems engineering group. And, the developers have access, on a daily basis, to that systems engineering group. [The developers] work with them on the tests and all kinds of other...

Mary Ann: Yes, and they act as part of the test group. They do part of the operational tests. Usually you'd give it to an end user, and they could play with it. Well, they don't have that luxury. So, this cadre they have of folks who were recent in that field. They'll sit down, and they'll do the testing. They'll find things and work with the developers daily as needed. They even are there for help with the helpdesk people for issues trying to understand what's coming in from the field.

So, they have lots of duties, and it works really well for them.

Suzanne: So, one of the things that this brings up—when you talk to people who are acquisition professionals—there's a construct or concept in the acquisition field called [constructive change](#). And, Mary Ann is smiling really big at me now because she knows that I'm, throwing her this hardball.

Mary Ann: Oh no, it's actually a very soft--

Suzanne: What is [constructive change](#) for those—if you don't know what it means—it's basically the idea that the government—when you have let a contract—you give people a statement of work. You give them a set of requirements, typically. And, you're not allowed to substantively or constructively change what you've told them to do without there being a formal process, usually called an engineering change proposal.

And, it's a big deal.

Mary Ann: A contracting officer on the government side—and there's usually only one or two of them. They have what they call warrants. They have the training, the background, and the authority to make those changes. If somebody makes a suggestion to the contractor, and if they're senior enough, the contractor will say, *Okay, I'll go do that*. That's constructive change.

Some of the rules now are—if you do that and the contractor has gone off and does it—you can be held not only legally liable for the silliness and may be prosecuted because you didn't have the authority to do that, but also legally liable for the cost. It could be thousands of dollars, hundreds of thousands of dollars depending what it was.

So, that's a real worry. Interestingly enough, when we did our very first agile paper way back five years ago, I asked about that. At that time, it was *Oh, we didn't have problem with that*. Well, it was a very small sample. Since then, you ask that question, you get people looking at you in...

Suzanne: Panic.

Mary Ann: Panic. Oh my gosh. *Yes, that's such a big issue*. I actually saw it on one of the programs that we were consulting with. We were doing some training with them. We actually saw some of that kind of thing going on. It wasn't to be bad. It was trying to make the system better. Some of it though was interesting. It was trying to push it more towards traditional development. But still, it was constructive change, and it was causing issues.

Suzanne: So, the caution to DoD contracting environment acquisition professionals that want to adopt agile methods and do some of these things, is you need to be aware of this. A key to making this not be an issue is to have the requirements that you're giving to the contractor doing agile at the right level. They're a little bit higher level than is typical in a traditional environment, so that you can allow for there to be change that is not constructive—in terms of changing the

contract requirements—but change that is productive in terms of making the product the way the users really need it.

Mary Ann: Right, and you need to make sure that not only do you, government people, don't fall into that trap, but also make sure that your contractors are following those same rules because sometimes that happens on the other side. It's all well-meaning, but it gets everybody in a lot of trouble. It can be dealt with, but it's something you have to be aware of. You have to make sure the right person has that warrant. If it's a contracting officer...

Suzanne: And, you need to make sure that they understand agile.

Mary Ann: Right.

Suzanne: And make sure they understand that we're not trying to do constructive changes. As a matter of fact, you need to help us understand if what the user is asking the contractor do is constructive change but also help us make the requirements at the right level. So, we can have the evolution that we need in the learning. I mean that's the real lesson for the acquisition professionals.

Mary Ann: My ideal acquisition professional there would be somebody who's been in the field, decided to become an acquisition officer, gets the warrant, and he knows both. Then he knows what's going on.

Suzanne: There's a few of those.

Mary Ann: As a fantasy of mine, but it would be nice.

Suzanne: I know at least one guy that fits that profile but there aren't many are grant you.

Alright, so we talked a little bit about the barriers to getting operational users to work closely with developers in terms of *they are in the different command*, and *they are not given a budget to do that*. But, what are some of the advantages of the operational users and the developers working closely together that might incentivize them to actually go out of their way to do this?

Mary Ann: Well, first off, they get what they want not what somebody thinks they want. If you have your operational user working with you daily—even if it can't daily, it's two, three times a week or upon, *I've got a question*. Or, once a week even if they check in depending on what they're doing. Daily is optimal, and they look at it and go, *Well, that's not what I meant. Well What do you mean?* would be the response from the developer. Then they have this little dialogue and all of a sudden. *Oh.* As a developer—and years ago I used to do this—people described what the system is supposed to look like or even the environment, and you get this mental picture, and then you go see the real thing. *Oh boy. So not like...*

So, if they can talk to each other and actually understand, because our English language is just so precise. Not.

Suzanne: Not.

Mary Ann: It's very rich, but it's not precise. So, when I say something, people can interpret it in multiple ways. A very simple example I use a lot of times is *how do you express a negative number?*

Suzanne: Minus X, whatever X is.

Mary Ann: Or, it's in red. Or, it's in brackets. All three are correct, but it depends on your context and your domain.

Suzanne: If I'm an account in my domain, I like to use it in red.

Mary Ann: So, three different ways of doing something very simple. But if you use the wrong one in the wrong domain, it's wrong.

Suzanne: It's not going to get interpreted correctly.

Mary Ann: It's not going to interpreted correctly. So, you need to have that knowledge and constant interface with the end user. That's one of the beauties of being able to talk to the developer. Because you make sure they're not doing a minus when you really wanted it in brackets.

Suzanne: I can say from the other side, what we've observed in talking to developers is the richness of information that they get from operational users. It doesn't just inform the current conversation. It informs their work from there on, and that's a good thing. So, it's important for the developers as well as the operational users.

I think this is one of those principles that even though there are some challenges in making it work in DoD settings, the advantages of this close working relationship between the people that have the need and that are going to use the product, and the people that are developing it—it's one of my favorite principles if you can enact it, because it makes such a difference in the outcome. I can't emphasize that enough.

Mary Ann: It does, and interestingly enough, years ago, when I was working in traditional methods. If you had access to the end users, your product was so much more robust.

Suzanne: It's always been the case.

Mary Ann: It's going to be. Agile proposes that from the get go. So, if you can use that, and figure out a way to make it happen, everybody's going to be happy. Developers are going to be happy because they're developing something at the beginning that people really want. The end user is going to be happy because it's something they can really use. And, it will help them with their job.

Suzanne: So, I'm aware of another setting that is actually in the army. They've got essentially system-of-systems. They've got lots of different systems. In that setting, they are using organizations like TRADOC, but they're not letting go of them at the beginning of the program. They keep TRADOC involved throughout all the different programs. They are seeing a huge amount of benefit from having that access and having those folks answer questions and go out to the field and get an answer that they usually don't have. So, there's a lot of different ways to implement this. The thing for an acquisition professional building an acquisition strategy who wants to use agile, or somebody who's coming into a program and agile is been suggested—is figure out what are the ways that you can get the operational users involved. You know working together daily, ideally it is in the same building and in the same office, but it could be on a video con [conference] or a Skype connection. You know, it doesn't necessarily have to mean you have to be co-located.

Mary Ann: Right. And, regular times like, *Okay, we're always going to talk at 8 a.m. or whatever, and depending on time zone you set up, you get on the phone and you check in. What have you got? Nothing? Okay, fine, talk to you tomorrow.*

Suzanne: It can be very simple.

Mary Ann: It doesn't have to be sitting there and waiting for something to happen. It just has to be access.

Suzanne: Right, Okay, I think we've beat this one to death. But, it is important, and even though it's a simple principle it's one that I certainly believe is one of the benefits of adopting agile. So Mary Ann, thank you for joining us today.

Mary Ann: You are welcome, Suz.

Suzanne: Mary Ann just came of a coast-to-coast trip last night. So we really thank her for taking time up today.

Mary Ann: We're being time-zone-challenged today.

Suzanne: That's right. The next episode in this series we will explore the fifth agile principle which says: *Build projects around motivated individuals. Give them the environment and support they need and trust them to get the job done.* Trust, that's such interesting English word and that'll be I think really interesting to talk about, won't it Mary Ann?

Mary Ann: Oh, yes, very interesting.

Suzanne: Yes, so we look forward to that. We hope you do too.

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