CP: <mark>Good day to everyone, and welcome to season two of TechNJ - where we delve into the tech topics trending in the Garden State. Today's topic is fitting for our first episode of season two - the great debate of agile versus waterfall. In keeping with the concept of these different methodologies, this season of TechNJ will employ different methods of getting information to you - so stay tuned as we play around with our format, and employ new and exciting ways to inform you in linear and non-linear fashions. Anyway, back to today's topic. Recently, I learned about agile and waterfall project implementations - the sequence of events involved in both methodologies, pros and cons for each workflow, and advice on how to choose between the two. So what, you may ask, are agile and waterfall methodologies?</mark>

KS: Sure, so waterfall and agile methodologies are two different ways to deliver products or manage projects.

CP: <mark>That's Kelly Silverstein, Project Manager for the New Jersey Office of Information Technology.</mark>

KS: In a waterfall situation, you're doing things in a sequential manner. So you're coming up with your idea, you're developing all of your requirements, from there you're starting your design, your building, your testing... so you really do things one step at a time. Where in agile, you take a design, you break it up into small chunks, and within each chunk, you do the same steps but it much shorter periods and you produce a result every 4 to 6 weeks.

RC: Exactly

CP: <mark>That's Rob Cunningham, also a Project Manager for the New Jersey Office of Information Technology.</mark>

RC: Agile is more fluid. It requires or allows for much more flexibility. Typically with agile, you have teams that are basically generalists. They have a specialized area, but they also have a great deal of knowledge across the board, because they may be called upon to do development, they may have to do some testing, they kind of work together collaboratively as a team and, as such, they're able to move forward and with a lot more frequency.

CP: <mark>So, during our conversation, both Kelly and Rob used a series of analogies to deeper explain the processes involved with both agile and waterfall methodologies. Kelly likens agile to the process of building a kitchen...</mark>

KS: You know, you meet with your contractor, you set your budget, but you don't select paint, you don't select cabinetry, you don't select your backsplash all at once - you do things in small chunks. So first you may do your cabinetry, then you pick your tile for the flooring.

RC: in terms of development, waterfall would be more like a car on an assembly line. in the back room there was the concept, and then there was a design. You know, if you've move

further there's the actual development, and in that development you have a product that's now being created. Each step of the way, there's more and more that's done, and in order for the engine to be put in, the body has to be there, and it's not like they can be done in tandem or in parallel. One is sequentially done to the next, so each activity is dependent on the previous activity, and you don't have a complete product until it's released. Once it's released, now you have the ability to test it, to make sure it all works.

CP: So, what advantages do you see in using the waterfall methodology?

RC: If you have a project where you have very clear requirements, and a very clear vision on the end product, the waterfall method is probably going to be the preferred method, because the project manager has the ability to just better manage the execution of that project because they know what that end state is going to look like. So the deliverables are very clear, the time frame for the deliverables become very clear, everything is very clearly defined up front, and it results in a very exact end product and end state.

CP: So then on the flip side, what are the advantages of using an agile methodology?

KS: So when using the agile methodology, one of the biggest advantages is you start to see results much quicker. Because you're doing things in smaller chunks every 4 to 6 weeks, the end user gets to see a product and it can get deployed in a much quicker manner.

CP: What are some disadvantages of using the waterfall methodology?

KS: One of the biggest disadvantage is that you're collecting all of your requirements at the beginning, and you can miss things, and as it goes down the path, the longer it takes to catch those missed requirements, the more expensive and the more time it's going to take to fix them. So unless you have really clear requirements up front, you run a greater risk of running over budget and over time. One of the other big things is because things are done sequentially, you save your testing until the end, and when you need to crunch time, you're going to cut it in the testing so you have a bigger opportunity to miss things and have things go into production where a few things may have been missed.

RC: Imagine you have a house that your building. You get to the point where sheetrock is up, kitchen's installed, bathrooms are installed, and you decide that the bathroom and the kitchen are in the wrong location, and they need to be reversed. Well, clearly the cost for doing that after you're at that stage of the project is going to be much more expensive than if you were at the very early stages and were designing the house, and you made that decision, so that's that's why it gets much more expensive at the end, and one of the drawbacks to the waterfall.

CP: so we talked about disadvantages with waterfall, how about any disadvantages of using agile methodology?

RC: Well, one of the things is that uh… because of the fact that there is this level of flexibility, sometimes people get a little too excited about the idea of flexibility, and you have constantly changing scope. And if that's not properly managed, you reach a point where you're just spinning, you're... you don't get to a delivery as you should. So you have to have a good, tight reins on that. Another drawback to agile is the fact that there's a tendency to slack off on the delivery of requirements and documentation. Agile doesn't mean that there is no documentation, it just means that things are a little bit more fluid. So one of the drawbacks is the fact that when you reach an end product you may not have a full complement of documentation to support that product.

CP: ==Agile, waterfall, fluid, structured, building houses, assembly lines - understanding the process behind these methodologies can be a challenge in and of itself. Determining when to employ these concepts can also become confusing - Kelly Silverstein expands on this…==

KS: there is no one-size-fits-all for what you're going to do, there are certain things to take into consideration.   The skill level of the resources that you have. If you have people that are specialist in just one IT area, that's really going to work much better for a waterfall approach. You don't really have… um... you need much more flexibility and... and the skill sets (inaudible) resources have to do things in an agile way. If your sponsor knows exactly what they're looking for, you're going to want to do things in a waterfall methodology. If they kind of just give you a concept, and they want to see results quickly, and they're willing to wait to see what the final final product looks like, then I would probably do an agile approach. A lot of times, our sponsor and our project manager together drive the type of methodology that's going to be used. So, we... we work a lot with our sponsor, and depending on how clear their vision is, and what it is a they need produced, and what time frame they need it produced, we can accommodate. So, our project managers are usually pretty well-versed in both arenas, and where they're not, our team overall is... we have people well-verse in both arenas, so they work together to help each other out.

RC: The better we, and we being the project managers, are able to communicate with the product owner or the sponsor around the approach of the project, you know, what makes sense for the project, the more likely you're going to see a clearer view on what the trend is.   You know, the trend can be moving toward agile if we're able to clearly communicate the value of doing that and help everyone - the project team and the product owner - understand the rigor that's required for that.

CP: ==There are also instances when a hybrid methodology can be employed, as Rob explains...==

RC: With agile, first of all, having a project team that's not located in at least in a general location makes it very, very difficult because of the fact that you have daily stand-up meetings, and there's typically your... your… your project team is co-located. So that there's easier communication amongst the team. It happens a little bit more organically, instead of sending an email continuously or, you know, flying out to meet people, to have discussions. Everyone's

either in the same room or you know on the same general area, so within a waterfall project there have been times where we needed to have daily stand-up meetings. it's to tighten up communication, to make make sure that we're focusing on the right things at the right time, and that the… the... the things that we expect to be delivered on a daily basis are being delivered and worked on.   Also, we've had co-location of resources within a waterfall project, and again for the same reasons that it's valuable to agile, it's valuable to waterfall as well. So, having these waterfall methods integrated with the agile methods is a real good way of helping a waterfall project move more rapidly, and in fact most projects that I run have been a blend of the two - some agile methods, along with your typical waterfall.

CP: Clearly the decision to use agile or waterfall methodologies, or even a hybrid of the two, is not an arbitrary one. Different projects and/or clients determine the best workflow for success. Roadblocks and bottlenecks still happen no matter what, regardless of agile or waterfall.

KS: The key to getting rid of bottlenecks is not the methodology, it's the project manager and the team, and it's all about communicating.   And you have to know where the bottleneck is, and how they prefer to have that bottleneck moved. Some people want you... are going to react only when you get to their dark... the door at their office, and when you're standing there, they're going to react. Other people prefer to do things via email or via phone, so it's really about the communication, not about the methodology.

RC: Yeah, Kelly's dead-on with that. Communication is 90% of what a project manager does. And so, what's... what's important is that when you run into issues - no project is going to be without issues and risks, it's just... it's not heard of. It's going to happen. The issue or the... the consideration here is how are you managing that, and the sponsor, or the steering committee, or whoever it is that needs to be aware of the things that you're encountering in the project - how is that being communicated to them? If it's something that they... if it's an obstacle that they can help remove, then that's going to alleviate that bottleneck. But if we do not communicate, and - say someone who is responsible for a specific task on a project can't get to it, it could be for a number of reasons - either their attention is on something else that may be a conflicting priority, or they may be encountering a problem with doing the task that they're trying to do, that information needs to be filtered up to a sponsor, or a steering committee, so that if they're able to do something about it, they can. And if they can't do something about it, that they're aware of the problem, and understand that there now maybe an impact to the overall schedule.

CP: Even though it's time to wrap up this episode of TechNJ, you can still listen to this discussion on agile versus waterfall - keep an eye out for additional excerpts from my chat with Rob and Kelly. Don't forget to rate us on iTunes and Google Play! We love to hear your feedback, so please email your thoughts, ideas, and questions to podcast at tech dot nj dot gov. I'm Craig Parker, thanks for listening!