

AVOIDING FAILURE

from the 2021 UMD Symposium

with Ivanov, Jacobsen, McLuckie

Kendall Lott: Greetings PMs, and welcome to our fourth year of highlights from the University of Maryland's annual Project Management Symposium. As with last year, this year's symposium was virtual, which means all the presentations were recorded and are available for viewing online. I highly recommend that you visit the symposium's website at <https://pmsymposium.umd.edu/pm2021/>. For \$150, you can listen to all the sessions at your leisure and earn up to 42 PDUs.

For this episode, we focus on managing crisis and avoiding failure. After what we've been through the past year and a half, we felt it was a fitting topic for the series kick off. You'll hear snippets from two excellent presentations, along with interviews I conducted with the presenters, Nikola Ivanov on "Managing in the Time of Crisis," and Justin Jacobsen and Chris McCluckie on "Why Good Execution is not Enough."

Nikola Ivanov: It's not preparing for a specific type of crisis, it's instilling certain values and capabilities in the organization and people in that organization to deal with the crisis, no matter what it is, when it occurs.

Justin Jacobsen: You're out there trying to produce your project deliverable. Variations within the work as it's produced are going to affect both time and cost in some degree. So we have to acknowledge that this inherent variation within the environment is going to affect our project plans.

Announcer: From the Washington DC chapter of the Project Management Institute, this is PM Point of View®, the podcast that looks at Project Management from all the angles. Here is your host, Kendal Lott.

Kendall Lott: We know that the success rate of projects is not as impressive as we would like. Listening to many of the UMD presentations, it became clear to me that while the success rate has improved, it's still not where we want it to be. For all the tools and all the expertise we bring, it seems only 19% of organizations report that they regularly have successful project completion – thinking satisfactory deliverables, on time, on budget. And then in a study cited in this very episode, 78% of construction projects do not hit schedule or budget estimates. In fact, they average 20 months over schedule and 80% over budget. PMI's 2020 Pulse of the Profession showed an improvement this year, but noted that about 11% of all project funding is wasted, 11%. 11%! That's more than the margin many firms make. When you add to that an unforeseen global crisis, you better have optimal organizational structure and leadership with thorough plans to address potential

crises, as well as an analytical understanding of risk and variation.

Kendall Lott (02:53): In this episode, you'll hear a lot about things like trust and transparency, leadership and taking in the big picture. Collaboration and stakeholder education. Our first presenter is coming from a scientific/engineering background. The second discussion centers around construction. But the observations and ideas they cover apply to project management across the board.

Once again, we begin our UMD highlights with Nikola Ivanov. Last year, he spoke to us about hiring and retaining A players. Now in 2021, after observing how organizations responded to the Covid-19 pandemic, he has some interesting tips for leading in a time of crisis.

Nikola Ivanov (03:35): I am Nikola Ivanov, I'm the director of operations at the University of Maryland's Center for Advanced Transportation Technology Lab, better known as the CATT lab. And my primary responsibilities include oversight of all of the projects at the lab: staffing, operations, basically everything that happens day-to-day falls within my purview.

Kendall: Last year, we got to talk about radical candor and basically talking about hiring and employment decisions as I remember.

NI: Mmmhmm.

KL: I was intrigued by that one because your experience is what brought you to that, it wasn't that you were a trained HR professional or something. It's like, look, I run a lab. Here's how I live my life.

NI: That's correct. And that's very much how this presentation is, as well.

NI: This year's topic is Managing in the Time of Crisis, and I think all of us have dealt with crisis at some point or another in our careers, but more importantly, especially with Covid-19 and challenges that that has presented for all of us. So let's get right into it.

What is a crisis? This is the definition that I use: Crisis is an unforeseen, often devastating event or series of events. So again, it's not something that should be happening a lot, and it's not something that you can always plan well for, and I'm here to tell you how you may be able to plan a little bit for it.

But what's important about crisis is that they're rare. If you have crisis daily, weekly, or even monthly, you're either not having a crisis, or you're facing some kind of a systematic organizational issue that's not sustainable and it's reflecting itself as these frequent crises. Or you may be operating in an environment that carries more risk than your business can actually sustain. And so there may be a fatal flaw in your business strategy and the market that you're in, or environment that you're in that's causing these crises.

One thing that I want to emphasize in this talk is that crisis is not the same as risk. I think as project managers, a lot of us are very familiar with risk and risk management. But fundamentally, managing risk is being proactive, while managing crisis tends to be reactive. And what I mean by that is we have risk registers. We think about risks, we develop strategies to deal with risks.

And the difference between a risk and a crisis is, as I said, it's an unforeseen thing when crisis happens. And oftentimes what's happening is either that the crisis is worse than your worst identified risk materializing or it could be that all your risks are materializing at the same time. That could be a crisis. As well as the fact that you may have a risk that you did not account for and didn't think about, and that's the one that if that ends up materializing. That's the difference between crisis and risk in my opinion.

KL (06:47): You separated crisis from risk or risk management. Tell me a little bit about that separation of the definition that you had in there, and why you chose to do that.

NI: Sure. I think risk is a concept that's very familiar to those in the project management field, regardless of the domain, and so I think speaking to the audience of Project Management enthusiasts about risk, I think is a familiar topic. What sets crisis apart from a risk is that crisis is something that's not very easy to plan for, in a way you would plan for a risk. In other words, for risks, we oftentimes come up with mitigation strategies or different ways that we are going to handle that risk when it materializes. With crisis, that preparation looks very different. It's not preparing for a specific type of crisis, it's instilling certain values and capabilities in the organization and people in that organization to deal with the crisis, no matter what it is when it occurs.

KL: Yeah, and you talked about like piling up the risk. The risk can precipitate into a crisis. And so I realized, to me it was like the idea of a perfect storm. You may be managing risk, but crisis seems to be something more about how people are resilient. I thought of crisis preparation as hygiene.

NI: I think that's a pretty good way of looking at it. Preparation, I think from the standpoint of planning, preparation for risk, or in this respect, assessing what the risks will be for a particular project, that's a very specific thing that's linked to a specific potential of an outcome. With crisis, I think the difference is that that hygiene that you mentioned is instilling those values in the organization, so that if all of these risks materialize, maybe you can handle them individually, but all together now they present a crisis. And while the mitigation strategies will help in the immediate moment, really, it's the fact that the staff and people involved in the crisis are not panicking, they're not making irrational decisions, they're relying back on some of those values that have been instilled in them throughout the time preparing for crisis is that hygiene piece, I think.

And so I think that's kind of how the two are set apart and how the two are related in some ways. Because you could have risks that materialize and grow into a crisis.

NI (09:33): So how do we avoid it? So the first approach is risk management. This is why we have risk management. This means, and you probably are familiar with this, it's identifying all of the things that could go wrong and then developing plans to address those risks when they materialize.

The other approach that you can have is process development and appearance. So whether that's project management process or make a process for hiring and retention, and if you're interested in that, my last year's presentation was on this topic. Engineering process, Agile process, whatever the processes you have in place, are there to reduce the uncertainty so that you don't have these unforeseen crises, but also to control those risks that you've defined.

The next approach for avoiding crisis is strategic planning. This is more of an organizational level

approach, where you look at the broader market forces and environment, your internal organizational goals, positions in the organization, and try to position the organization in a way that reduces that risk and capitalize on opportunities that may be available.

But what happens when a monumental risk that wasn't in your rice register suddenly materializes? So I think the key element of crisis is transitioning from being a manager to being a leader, and there is a difference between those two roles. And as you converge those two roles, I think that's what you really are looking for, but even more important than becoming a leader is becoming a leader of leaders. You need to be able to empower others to perform as their best in crisis.

NI (11:19): So let's talk about some key ideas, The first one is avoiding a narrow view. In crisis, our view tends to narrow to a specific and immediate thing. Right? Something's happened and we jump to it and we think about that, and that's a human nature. We often call it tunnel vision, you've heard that. Somebody gets tunnel vision, they get focused on something, which is beneficial in some cases, but it can be detrimental in many ways, as it may end up resulting in chasing a red herring or getting bogged down in the weeds and not seeing an obvious big picture resolution or impact.

The key is really to expand your aperture and understand the bigger picture and make those connections. Because those connections between events, between stakeholders, individuals, oftentimes may either expose what the cause of the crisis is and how to handle it, or to capitalize on those relationships to be able to resolve the crisis.

If you're in an executive role in your organization, you need to balance your involvement between strategic and tactical. So when a crisis occurs, oftentimes tactical is the first approach, right? You need to deal with things on the ground. So there situations where you need to stay out of, if you're an executive, stay out of that tactical level and remain focused on strategic direction, right? You need to continue thinking about the big picture, the impacts and so on.

However, I will say one thing that needs to happen is there is a value in being seen on a tactical level. And what that means is being seen as understanding the tactical situation on some level and empowering others while modeling the behavior. So again, this is going back to the most important point here, which is being a leader of leaders. So empowering others to do what they need to do, and being there to support them.

KL (13:16): When you gave the presentation, I noticed that you said something from a leadership perspective, or actually really for a project manager acting in that role: don't get caught in the tactical, but being seen at the tactical level was important. What are you going after there? Why does that matter? And where have you seen that?

NI: So a lot of times, I think what happens is when a crisis happens, there are two, I think, natural responses that people may have. One is to try to handle that crisis immediately, because it is a traumatizing event, right? Crisis usually raises stress levels in everybody, and if somebody's in a leadership role, like a Project Manager, for example, they may feel the need to be hands-on to resolve that crisis as quickly as possible, because I know what I know and I can do it myself better than anybody else, because I understand what I need to do. So that's one reaction.

The opposite of that reaction is, and I mentioned this a little bit in the presentation as well, is that

courage or lack of courage where the crisis creates that flight response in a leader to say, “Well, I don't know how to solve this. This is not something I did, and I don't have the sufficient expertise to help, so I'm going to exclude myself completely out of this.” I think both of those extremes are not necessarily the best approach to managing crisis. I think taking the approach of understanding what leadership's strengths are – so what are some of the things that you as a leader may have to offer in solving the crisis problem – but at the same time, again, going back to the previous note of empowering others who are experts to handle their part of the work, and be involved in clearing the path for them so that they can be experts in the area that they're experts in.

So that's the part where you need to be seen, so you're involved and you're not leaving that team or set of teams alone to deal with the crisis. You're there, right in there with them, but you're not the one that's running the show necessarily if you're not the expert in that area.

KL: The ability to get others to work through it, so it's kind of a cascading thing.

NI: That's correct.

NI (15:36): If individuals in an organization feel empowered that when crisis happens they have ability to lead in the area of expertise that they're experts in, I think the probability of resolving a crisis successfully is much higher than if it's instilled in one individual who's now the lead for that particular crisis and responsibility relies on them to resolve the issue.

KL: In other words, you seem to have taken crisis management as driven by leadership, but fundamental to the culture. Because it's how we know how we operate. How did you experience that during the year then?

NI: Yeah, so as an individual, I am not able to connect with every individual in the organization. There's just not enough time to be able to do so. So there is some reliance that I have to have on people that I work with to make sure that they're instilling the same types of values that I would want to instill in every individual in the lab. So in effect, as I worked with others, I was trying to empower them to take ownership of that, and kind of pass that ownership down to everybody else they work with.

So individual teams had the freedom to understand what is the best, most effective way for them to work together, what is the most effective way for them to accomplish the mission, and then overall, in the lab as a whole, look at some of these crises that have occurred throughout 2020, with the pandemic, and learn what has worked in some respects for one team and maybe not for another, and try to pick up what are those differences, and what are some of the lessons that have come out of that and can be applied to all of the teams in the lab, to make the lab as a whole more resilient to crisis. And so in effect, it wasn't my work, it was the work of everybody else in the lab working together to gather that information to learn those lessons and then apply them broadly.

NI (17:44): Now, the second key idea here is speed over precision. And this one might be a little counter-intuitive, because oftentimes speed is a way to make a mistake. You rush through things and you're more likely to make a mistake. But I will say in crisis, oftentimes accomplishing 70% or 80% of the goal may be sufficient to downgrade that crisis into a manageable issue. So striving for an immediate 100% perfection may oftentimes result in analysis paralysis.

So the key is to prioritize and make smart trade-offs, and it's important to then identify those key decision makers, and embrace that action. And what do I mean by embracing action? Sometimes if we're in crisis, we tend to slide into, "Well, whose fault is it? Who did it?" Those questions are maybe driven by trying to understand the situation and understand what caused the crisis, but oftentimes it turns into a blame game or punishment that actually may be counterproductive to the resolution. So again, we want to focus on action and those key decision-makers that can help in it.

The next key idea is to adopt boldly. So I think identifying and knowing what not to do is important in crisis. One of the things that happens is that as you exit the crisis, if you're successful in exiting the crisis, you must adapt and then pivot to ensure you climb out better than you or when you entered the crisis. So again, I kind of look at this as a glass half full. I see it as an opportunity to learn, an opportunity to avoid future issues.

In addition to adapting in that way, I think you need to have comfort in making imperfect decisions, understanding there's uncertainty and some level of additional risk. But sometimes not making a decision is worse than making an imperfect decision, and you have to have comfort in that.

Engaging for impact. This is understanding who you have in your organization. Who are the key stakeholders that you will work with in this crisis? And it's important to understand who those people are and to engage them appropriately. So this, again, going back to my "Be a leader of leaders" point, it really means making sure that you're empowering other people and modeling behavior to inspire everyone to row in the same direction.

The focus is on the goal. You're just seeking order, not control, so you don't want to come to the situation saying, "I want to have everything under control. Everybody do this and that and the other." You're looking for order. What is the approach? Let's all row in the same direction. And that helps eliminate some chaos and bad decisions.

NI (20:39): So in addition to key ideas, there's some key values, and these are different things that I want you to think about as you get into a situation of crisis. Courage is an interesting value. It's one of the 10 key values that at the CATT lab we use as a way to evaluate all of our employees and all of our applicants for jobs. So in crisis, courage means making the right decision even when it's difficult.

And part of that is managing fear. That's managing your fear and others fear. Managing fear allows you to think more rationally and then set that example for others, right? So fear needs to be managed in some way. It's okay, it's understandable to be afraid of making certain decisions or approaching certain things in a certain way. But you have to be able to manage that.

The second key value is integrity and transparency. You always have to act with integrity. Sometimes in cases of crisis, as I said, you're trying to manage fear so they can think rationally. Sometimes we don't think rationally, and when you don't think rationally, bad things can happen if you start compromising your integrity or hiding things. So that means don't hide or sweep things under the rug. Do not shift blame or point fingers to others, that does not help you in the crisis, and in fact, if you come out of that crisis successful, that can bog you down for the future if you took that approach.

KL (22:16): When you're in the grip of the crisis, if you can't act rationally, you better have

integrity. I think I'm paraphrasing you there. When rationality goes out the door because you're in fear at some point, this underlying premise of integrity is important. What did you mean by that?

NI: If the values are instilled both in an individual and across the organization, then even if you're struggling with rationalizing the situation and coming up with a logic answer, there is some innate natural response you will have that will be to do the right thing. So in other words, that integrity that should be practiced and taught throughout the time and not just when the crisis happens, will prevent that crisis from spiraling out of control and getting worse because you start making decisions that maybe are not in line with your personal and organizational values.

But if you let those personal and organizational values permeate your decision-making, then even that uncertainty and that fear you might be feeling, it will still allow you to make decisions that are in line with your values. Even at the end of the day, if they feel like wrong decisions in a logical level, if that makes sense.

NI (23:41): The worst thing you could do in a crisis is not learn anything. Crises are bad, and nobody wants to be in a crisis. But once you're in it, the worst thing you can do is come out of it, not learning anything. So you must identify these lessons and implement these lessons in your future, or you're bound to end up in another crisis sooner or later, and have the same situation.

So even though the crisis itself is uncertain and unknown to you, if you have the right skills, right processes, right culture within the organization, that encourages courage and ownership and empowerment, you will be more effective in handling your next crisis.

KL (24:23): The one thing I thought was really interesting as an ending though, when I was scanning through your presentation, is for all of the crisis, reframing it as leadership, and somewhat decision-making around that, was you end with compassion and kindness. What brought that out and why that?

NI: So the way I see it is, compassion and kindness is a set of values that I think are applicable regardless of the situation, the professional setting versus personal setting, or crisis versus no crisis. I think compassion and kindness go a long way, and I think oftentimes in a professional setting, compassion and kindness take a back seat to other priorities. And I think, to harken back to the values discussion, I think setting compassion and kindness front and center, and modeling that, is actually probably the most important thing to do, because all of the other values that you may utilize in crisis, in some respect are better applicable if you have compassion and kindness in crisis.

KL: When things are going well, everything you do seems to flow. But the real test of a team is when things have gone badly, right? What is the resilience factor, what is their recovery method, how do they not act horribly when things have gone bad? I'm thinking as a project manager, we try and plan for the outcome we want, but it's almost like you're saying, we should also go ahead and plan, one way to see the big outcome, is to plan for what happens when it goes wrong.

NI: I think when you extrapolate that to a strategic level for an organization, then the true test ends up being those values that you built throughout time, so that you are the person or set of people or an organization that you want to be in those crises. So again, you're absolutely right. You plan for a good outcome, but you should plan your culture in a way that deals with any outcome, even if it's not positive.

KL: It's about resilience. And Nikola calls us to affirmatively promote the environment that enables that resilience with specific values: courage, integrity, transparency, compassion and kindness. Beyond management tactics, setting up a harmonious, trusting and empowering vibe is the leadership approach that builds this resilience. Don't be afraid to make bold, possibly imperfect decisions. The key is to avoid paralysis. Don't micromanage. Just get everyone rowing in the same direction.

KL (27:18): Few endeavors are as fraught with potential pitfalls – OK, literally and metaphorically – as construction. Think about all the teams of craftsmen, the materials, the timing. Then add high dollar budgets and totally unpredictable factors like weather, and you have a recipe for disaster. Justin Jacobson and Chris McLuckie have been there, done that, more than a few times, and they're here to provide some insight into how managers in any endeavor, whether it's construction or IT or fundraising, can keep the risks down and the stakeholders satisfied.

Justin Jacobsen: My name is Justin Jacobson, I am currently the Director of Innovation Development for MBP. We are a construction management-as-agent firm, focused primarily on representing owners in the construction process, and my primary job is to survey the market, find new tools and techniques that we can use to better serve our clients, and bring them in and get them incorporated into our construction management processes.

Chris McLuckie: My name is Chris McLuckie. I work for the same firm Justin does. My job now is I'm in the Area Manager, so I'm more of a people manager now than I am a construction project manager. And it's my job primarily to get people up and running with the innovations, and to have them...you know, to staff the projects that we get.

KL: You did an interesting presentation on “Why Good Execution is not Good Enough,” and that alone had me caught by the title, because our goal is always like how you're not getting to good execution. And it's like you guys are like, Oh, no, no, no, no, no. Good execution still doesn't get you there. And the presentation flow was basically, as I saw it, What goes wrong? Why does it go wrong? And what are we going to do about it?

CM (29:07): So many projects in our industry of construction, as well as in many other industries, tend to finish behind schedule and/or over budget. This graph identifies the actual cost and schedule performance of 80 construction projects within the mining infrastructure and oil & gas sectors, thought I'm pretty confident that it would apply across most other constructions sectors, as well as many other industries. The average project in this example was behind schedule by 20 months, and over budget by 80%. There was actually one – the only one out of 80 – that actually finished on time and budget. Another 10 finished on or ahead of schedule, but over budget. Two finished within budget, but beyond the schedule. And 47 projects, or 78%, experienced both schedule delays and cost overruns. Now, this type of performance is common in the construction industry and other industries as well, and, in most cases, has become expected.

JJ (30:14): If you look into the PMBOK®, it defines a project is a temporary endeavor to create a unique product. And it's almost a cliché within project management, that's always the case. We always say every project is unique. Yes, that is true, but it doesn't equip us with the appropriate tools to make real changes and improvements in what we're doing.

So stepping back into one of the specific processes within project management, the project planning process, project Management has an approach, but it also has an implicit assumption. The basic approach is we take the entire scope of the project, we format a work breakdown structure, so that we have every portion of work considered for the project contained within that breakdown. And then we decompose it. We decompose it into divisions and systems, components, all the way down to the activity level. And we do that so that we're better able to define those activities. We're better able to estimate those activities.

Once we've defined them well, we sequence them. We need to know what order we're going to conduct the activities in, and put these activities together, and that enables us to have an accurate estimate. We know the quantity of work within the activity, and also the sequence in which it's contemplated in being done. Once we have an accurate estimate of the quantity of work, the duration that is going to take and the interfaces between the activities around it, then we're able to produce a schedule. The implicit assumption in all that this process is, if we break it down to the granular level, accurately estimate it, roll it back up to the top level, that we'll have an accurate overall budget and overall schedule with which to produce the project. But there's a problem there, and that is that assumption is not really true.

KL (32:04): We get trained as project managers to decompose everything, right? But the comment that I pulled out of it was that decomposition alone doesn't work, and that these estimates are simply not right when you break them down. So your point is, is that we tried to drive to a level of specificity that kind of trick us into thinking it's real?

JJ: Yes. I wouldn't go so far as to say decomposition doesn't work, but what I am saying is decomposition doesn't capture the totality of the work. We're making a lot of assumptions and we're assuming away a great deal of the work that goes into executing each one of those activities.

JJ (32:47): So any estimator will tell you that that point number that they gave you for the overall estimate, as well as the line items in an estimate, is a guess. It's an estimate, it's not an actual figure, it's not precise. And we know that any given estimate, whether it be cost or whether it be duration, it could be a little bit less, a little bit more. And that's not due to any specific factors, just due to the fact that it's an estimate and things in the environment are different, they vary.

The Father of Quality, W. Edwards Deming, points out that variation is a fact of nature. Anything that exists in nature is going to have variation, and this is really an outgrowth of that. Not only is the estimate an educated guess, but in actual fact, during implementation, things change a little bit left and right. You need to account for that. And also in its execution. You're out there trying to produce your project deliverable, the variations within the work as it's produced are going to affect both time and cost in some degree. So we have to acknowledge that this inherent variation within the environment is going to affect our project plans.

KL (34:08): Chris, how do you see that failing as you're looking at staffing? Because that's probably the side you see it on, as a resource person, right? Making sure that everyone's got someone hired and ready to work when they need to have them working.

CM: Well the staffing and the resource is just one of the things that all has to come together at the right time. I mean, to accomplish a task, you need the materials to be there, you need the people to be there. You need all the appropriate county approvals, you need all the RFI responses and all the

answers and the submittals, and it all has to come together at the right time.

And especially as we see the construction market today, it's so busy that if something slides in your schedule just a matter of a few days, the sub-contractor's got some place else for those people to be. Because you can't afford to have somebody sitting idle waiting for any one of these factors to be put in place so you can start.

JJ (35:08): We need to acknowledge within our project plans, that there's some missing information. If you look at a project schedule, it really shows activities. One thing it doesn't show is the fact that each activity is actually an IPO model: Input – Process - Output model. So there's multiple inputs that go into the preparation for the start date of that activity, and all of those inputs need to be ready.

So in this instance, we're talking about a construction example – material and manpower. We need the craft skill appropriate for the activity. We need coordination efforts, logistics. We need space. We also need to account for safety and pre-work administration... so multiple, multiple items going into that start. But that doesn't reflect in our project schedules. And it doesn't do that because it's just too unwieldy to manage a project schedule, incorporating all this information. So the assumption here is that that activity leader, that production process manager, is going to account for all of those inputs, and have them ready to go actively and on time to start that process according to the project schedule. That's a giant assumption that rarely holds true.

KL (36:20): But project managers discuss dependencies all the time. We train to dependencies, through PERT charts and things, and to think about it that way. What you're highlighting is simply that it's too rich in activities to know all the dependencies? Or is there something about what we've chosen to focus on in dependencies goes wrong? It's this network effect, right?

JJ: Well it is. If you start thinking of every one of those durations or every one of those costs as ranges, then you start to see the number of networks that are possible. And when you start varying those values left and right, your critical path could change all over the place. You could have multiple, multiple critical paths. How do you manage all those?

It becomes extremely difficult, even if you're doing good scenario analysis, to account for all the possibilities of network knock-on effects once you start having variants in your execution.

CM (37:18): We were working on an elementary school project, and in my conversations with the owner, I asked the owner how long they typically give a contractor to build an elementary school. And his answer was 14 months. That I was their standard, 14 months to build a school. And I asked him how many actually get done in 14 months, and his response was, "Very few. Most of them take closer to 16 months." So in the interest of the discussing ranges, this owner had already accepted that the 14 months he was giving his contractors was somewhat arbitrary, even optimistic, and he knew that the actual completion time was likely to occur somewhere in the range of 14 to 16 months, because it's not exact.

And the same thing applies to cost. We can count the exact number of electrical outlets and light fixtures in the project, but then we assign an average amount of wire, and other material, and an average amount of time that it's going to take to put these in. And then we try to manage it so that each individual one falls within that range of plus or minus that average, and that's how a contractor

makes money. That's how they price things, but it's far from an exact science.

JJ (38:41): In construction we use almost exclusively Critical Path Method construction schedules. And Critical Pat construction schedules will tell you the earliest time at which that project can possibly be built. They do not account for this variation. And they do not acknowledge that this project is going to take longer, and that's a lot of the reason why Chris's example applies. That owner knew that that construction schedule was not valid, not producing a valid completion date.

So if we acknowledge that, and in as much we're putting cost contingency into our projects, we need to put time contingency as well. If you look at project schedules, most project planners and most project, in our instance, in the construction industry, superintendents implicitly know that this is going to happen. And what happens is, they add additional time into their duration estimates as a buffer. And the problem with that approach is twofold:

One is that work tends to expand to consume the time allotted to it. If I give you five days, you're going to try to finish in five days. If I give you seven days, you'll finish in seven days. And that's just the nature of how we try to plan, conduct and complete work. And the additional layer on top of that is that, because I can't see that extra two days as a time buffer and not as work time, I can't manage it. And so this additional time that's loaded into our schedule becomes unmanageable. We can't quantify it. We can't work towards those deadlines, and it just disappears into the wash of project execution. So we encourage everyone to think about explicit time buffers in your project plans.

KL (40:29): So we see the problem, and we get the idea is that there's more complexity, that we actually couldn't document all the complexity even if we wanted to, and that when we do document, define it and see it, we actually forget that we're picking a point that might be the most probable, there's a huge range around it. So we've got the nature of the problem here. One of the suggestions you made was buffering, which I think is really interesting, because how the Agile world and how PMBOK® look at buffering are different. What do you mean by buffering and how have you seen it play out?

JJ: In the construction industry specifically, when you say the word buffer, the assumption is float. And what we're saying has nothing at all to do with float. Float is a shadow of the network schedule that you've developed, it just *results*. It's not intentional. What we're saying is, put intentional time in your schedule that has network effect, that is a buffer to help absorb this variation as you're executing, to give you time to do other things. Otherwise you're chasing that finish date all the way to the end of the project and it just keeps getting pushed out of...

KL: ...And it moves away from you as you get towards it.

CM: Float also has absolutely no impact on the critical path, which is the shortest period of time for you to get the job done. I mean, float's happening around you on other things. They can start and stop sometimes, and it has no impact on when your job is done. But when you figure out your critical path, by, almost by definition, there's no float in your critical path to get you to completion. So if anything along that string of events happens, you're not going to make your completion date, and that's why contractors, your critical path is always shifting, because something impacts the critical path, so then something else becomes critical.

KL: Yeah, I liked your point there, it's almost by definition, why are we talking about float? It's not the thing on the critical path.

JJ: And the other reason why we talk about buffers is they're *intentional*. Somebody's calculated it, analyzed it, and put it in there specifically. And we do have entities, contractors who achieve schedules. And if we look at it probabilistically, they should not be able to achieve their schedule because they haven't accounted for this variation, this risk.

But what's happening is they're padding their duration estimates. Because they know, "I can't achieve the schedule if I tell them what it's really going to take me, so let me pad on a couple of extra days on all the activity. All my five-day activities are now seven days." Well, that's not manageable. We can't see that padding; we can't see that buffer. We can't manage to it, so it just disappears into the cake

KL (43:13): So you're not saying just do what we naturally do, which is just buffer the time, add to the time. You're talking about with intent. And you talked about calculation. So how would someone express this?

JJ: So the starting point is back to your PMI quantitative risk management process. We do quantitative risk analysis, come up with a confidence level of a completion date, and use that to calculate how much buffer do we need overall for this project? And the starting place that we would suggest is just start with a time contingency. Put it at the end of your network schedule, and have that there, managed as a contingency for time to soak up this time variation. And then once you're good at that and you can do that, then you can get a little bit more complex and start looking at merge points in your schedule and breaking off some of that contingency and buffering those merge points.

KL: Tell me about merge points.

JJ: So anywhere in your schedule where you have multiple inputs, multiple predecessor activities that are coming together to enable you to move forward, that's a merge point. And there are critical ones out there. Drying in a building, for instance. We really can't get going thoroughly on a lot of the interior work and mechanical work until that building's dried in. So that merge point tends to be a really big one.

KL (44:35): So it's take the ranges, put them together and see what the risk is at multiple ranges around certain estimates at merge points, and that starts to tell you what your real critical path variation is likely to be.

JJ: Yes.

KL: Are you suggesting then, as speaking to the key stakeholders, that you end up giving them a range? "This building will be done by Labor Day. Or maybe two weeks later or two months earlier..." How do you communicate this variation in clarity? The tension between the two?

JJ: Stakeholders want one number. They don't like ranges. It really does require some client education of, you know, we can tell you a number, but this is what that number means. It's a point on a curve, and I need to show you the whole curve, and show you what the range that we're likely

to come in, for you to have a full understanding of what that one number is that I gave you. So it's more than just giving them the range. You've got to spend the time and walk them through the thinking around that estimate.

KL: So I'm hearing a lot around intent. Use the standard techniques we have, but with a little more clarity, recognizing we're never actually right. There really is variation, that's the key. It's known that there will be variation. No estimate is actually real in and of itself. And then the big one is the communication. To be clear to stakeholders, you said education is what you really said. They have to understand what you have done in your calculations.

Would you as contractors or consultants for the contracting, accept that from sub-contractors? They're like, "Well, let me tell you about that..."? Or in fact, is that what you ask them to do for you in these multiple kick-offs?

CM: Well, that is largely what UCS do is they ... a big part of the scheduling problem is that the owner establishes a schedule long before the contractor's even on board, and makes them commit to it. And the contractor wants to do work, so they accept it, knowing that it might be a highly optimistic schedule. And the way it's set up is that on contract completion date, there's frequently a punitive penalty that gets assessed back to the contractor. There's absolutely no incentive for the contractor to finish early. So you've got this date and then the contractor agrees to the date and the contractor pushes it down to the subs and says, "Well, this is what I agreed to, and this is what you have to agree to to get me there." And so there's no collaboration, there's no teamwork in helping to develop this to come up with what is really the most likely scenario.

CM (47:09): One of the services that we provide as an agency construction manager, is often helping to manage these claims. And we worked on one a couple of years ago, and we were told going in that the primary cause of this claim was that the glass storefront was going to be late. And everybody was managing and fighting over this scheduled activity called "Procure and deliver the storefront system." And there were countless emails, countless letters, correspondence going back and forth, about why the storefront system was going to be late.

And then one day, everybody breathed a sigh of relief, that the storefront system had actually shown up. And the steel that was needed to be in place to support it wasn't ready. Because nobody had taken a step back and managed all of the dependencies that went in to installing the storefront, because they were all focused on the one activity, which was the problem, and nobody was managing all of the other things that were required to be ready for when the storefront arrived.

JJ (48:18): We like to really focus in on that, "Manage the Merge." So within the schedule analysis effort, any time you have multiple activities merging into, as predecessors of a particular activity, that's a high risk item. That's a high risk portion of this project schedule, for us as construction management advisors. So we're really focused in on those areas.

But if we acknowledge that each one of those activities is actually a merge point as depicted in the graphic, that highlights the fact that we really need to have robust solutions for dealing with these multitude of merge points within our project schedules. So putting together effective risk responses for those, and effective standard operating procedures and processes to deal with this multitude of merge points, will improve your project execution.

CM: Typically in construction, we look at merge points that are farther out in the schedule from a little bit of a higher level, but then as they get closer, we should drill down. And Just is exactly right. It would become completely unwieldy and way too cumbersome to incorporate every single input that needs to be done at this merge point. But talking about the example of the missing steel as the glass was being delivered, simply having progressively more detailed meetings as those things drew closer in the schedule, and had they officially identified the steel structure as something that had to be done before the glass got there ... a simple meeting between the groups would have identified this problem. Because my guess is... and I don't know this for sure ... but the steel contractor had heard that the glass was going to be late, so he backed off and didn't worry about getting his steel done on time. And rather than coordinate that, somebody had been responsible for identifying that all the merge point inputs were done, that just got overlooked, and it ended up costing them almost two months in delay.

KL (50:26): It's like these discussions of multiple universes, and like the only thing that takes them off the table is time. As you lose opportunity for variation, moving towards the end of the project, you know that, "Oh, this one range of outcomes is no longer an option for me." How do project managers attempt to correct for that now?

JJ: Well, the one big thing that has changed is the contractors have started to have kick-off meetings, not just global project kick-off meetings but certain aspect kick-off meetings, in which they get the next group of subs together that are going to have to coordinate to perform a certain task, and they will have a kick off meeting. And that has helped some. That's generally where you can get the input from each sub, that yes, my part is ready to go. But there are still a dozen other things, from submittals to county approvals to... just a whole wide variety of other things that are still missed, so...

KL: Well, that you don't control, it sounds like. They're external to your environment in some sense, to some degree.

CM: They are. And the big issue with the kick-off meetings, having been involved in a bunch of them, is they usually happen about the day before the task is supposed to start. So if somebody throws up a red flag or if something is missing, there's no time to respond.

JJ (51:57): And then turn to our final solution: Root Cause Analysis. So we know that there's variation in our schedule. We've implemented already a buffer, a time buffer to give us time and space, to work towards achieving a better schedule. And we've implemented activities, risk management activities to deal with those merge points about the structures, to defray those and mitigate those problems.

But even then, you may have a risk that's realized. You may have a problem that comes up. And what we want to encourage everyone to do is, then take the time, take that time that you have allotted to that buffer, to step back and do some Root Cause Analysis. Where is that problem stemming from? You know, we like to do it at MBP, the Five Why's technique. Drill down into it, get to that root cause, and look for countermeasures to that particular root cause. What we're encouraging everyone to do is prevent that fire-fighting that we all encounter on the project management assignments. Things arise, emergent risks come up, and we run around and try to stem the bleeding on those items and... That's fine, that's acknowledged that that has to be done. You've got to keep the project moving forward and we have to stop that problem.

But we shouldn't stop at that point. We need to also take a little time, drill into it to find the root cause, and put a countermeasure in place, because if you don't do that, it's very likely that that problem is going to keep coming up through the life of the project, continuing to introduce additional variation in your results. So what we're really overall looking to do is provide a structure that helps us build a more stable system. You want to move variation, make things slow, steady and accurate throughout the life of the project so that we end up with a better result at the end.

CM: Most of us who have been in management for a while, or are familiar with lessons learned or after-action reports, where we come back at the end of a project, and kind of break down things that went right and things that went wrong. Unfortunately we're not very good at doing that in an ongoing fashion in the middle of a project.

Using the steel and glass example again, what they should have done was a lessons learned or after-action in the middle of the project to make sure that whatever caused this problem didn't then go on to cause other problems later in the job. Because they still had a lot of work to do with interior finishes and mechanical systems and various other things. And frequently, far too often, we end up looking at these problems as isolated incidents, and we try to place blame, rather than do what Justin is suggesting, which is used the Five Why's process or a fishbone process to actually get back to the root cause, which is usually a process problem and not so much of an individual failure, and to solve that going forward, and to actually change the process and put processes the place that will allow us to be more effective.

KL (55:02): How is trust playing out here in the real world for you guys?

JJ: We find that trust is a tool for surfacing information and building collaborative solutions. The best case scenario for completing your project within budget and on time is working together as a team.

CM: The word partnering has a certain stigma associated to it in the contracting industry. But the parameters of partnering, the parameters of being transparent and of communicating, when it's done correctly, it actually works. When you put your cards on the table as a contractor and say, "Look what you're asking me to do is going to cause me this, and it's going to take me this much time, and it's going to cost me this much in overruns." How can we as a team with the... theoretically as the owner, you hired the architect, because they know as much about whatever type of building you're building as anybody else, you hired your contractor because 1. they had a good price, but 2. because they are experts in building that kind of billing. So get everybody together and collaboratively come up with the best way to solve the problem. And the owner needs to understand that that solution might cost them a little bit of money and a little bit of time, but it will cost them significantly less money and significantly less time, if they get to the best decision quickly and move forward with it.

JJ: We see that there are better ways to complete projects. We see that there are experts out there who know how to do it. But they're not widespread enough. We're not doing the right things, and that's because we're focused on the wrong things. We're focused on point estimates, we're focused on Gantt charts, and in the technical weeds. And we're not focusing on the softer side of project management: developing trust, building realistic assumptions and building methods to counteract and deal with the variation that we know is going to happen on the project, and that we know we need to plan for and mitigate.

KL (57:04): So this is like buffering with intent. Rather than rounding estimates, because you don't really know what it's going to take, it's about understanding that variation can be, and should be analyzed, and that the power of compounding works against us, as one variation triggers another... a catastrophic pile up of realized risks. Manage the merge points where the dependencies collide. As they approach, drill down into the details. I heard two really interesting timing twists to our old PMBOK® tools. First the kick-off meetings: Not just for the beginning of the project anymore. And second, lessons learned with Root Cause. Don't wait until the project closes out. So hold those kick-offs at various stages during the project, not just the beginning, and get those lessons, particularly at merge or inflection points in the PERT chart, and use those lessons now.

OK, big themes in avoiding failure: When things go wrong, don't play the blame game. Lessons learned are invaluable. Track them and implement them. Managers need to stay focused on the bigger picture. Promote values of honesty and integrity, and abide by them. And trust. Oh, we hear it so often, but Nikola wants it designed into the team prophylactically to build resilience, preceding crises. And Justin and Chris situate trust, not just as a condition for the team, but as a tool to drive better estimates. That's what leaders do; that's what effective PMs need to do.

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