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Marcello Sgambelluri



Mike Merrill:

Hello, and welcome to the Mobile Workforce Podcast. I'm your host, Mike Merrill. And today, we are sitting down with Marcello Sgambelluri. Marcello is an expert on BIM and technology related to BIM. And he's actually been awarded the best speaker at Autodesk Universities AU Awards for the last eight years, so pretty cool. Obviously has a wealth of information and knowledge about BIM and how contractors should take advantage of the software that's available today and where the technology is heading tomorrow. So hello, Marcello, and welcome to the podcast.

Marcello Sgambelluri:

Hello, Mike. How are you?

Mike Merrill:

Doing great, thank you. Appreciate you coming on today.

Marcello Sgambelluri:

Thanks for having me.

Mike Merrill:

You bet. We've had a few guests come on and talk about BIM, I don't know that we've gotten in the depths of the conversation capability or really some of the finer details on what BIM is today. But could you give us a little background on your opinion on how BIM was developed and maybe the history of that a little bit.

Marcello Sgambelluri:

BIM stands for building information modeling, and the idea is that you're not just building lines, arcs, circles, points, solids in a software to represent the building, you're actually building smart components that have rich data behind it. And when you do that, then you're able to use that information in a lot of different ways.

So BIM has been around actually quite a while now. I started working with it in technically 23 years ago is when I actually technically started working with it. But I think the term started to float into the AEC industry probably around the early 2000s, particularly when Revit started becoming more popular among AEC design firms. And so that's been the buzzword. But quite honestly, this technology continues to grow and adopt. And so, even though BIM tends to be the backbone of the technology branch of AEC, there are plenty of other new technologies that complement it. And I suppose we can get into that a little bit later, because we're going to get into different terms that are around and things like that, and hopefully I'm here to try to clarify that.

Mike Merrill:

Yes, I think that'd be awesome. I guess one of the questions that I had, how is BIM treated overseas versus the United States? Is there a difference?

Marcello Sgambelluri:

There is a difference. The thing with the way BIM is managed in the United States ... And when you mean "overseas", I suppose you technically mean probably in Europe and other places outside of North and South America probably is what you technically mean there.

Mike Merrill:

Sure. Yes.

Marcello Sgambelluri:

Well, just in general, BIM in the United States doesn't have a overarching regulatory body or standardization that is required, let's put it that way. There are "BIM standards" but each project in the United States is not required to follow it. So in that way, BIM doesn't tend to be standardized from project to project. Now in other places like Europe or even parts of Canada,

they do have requirements, and so there tends to be more standardization in terms of the process for BIM from project to project. So that's how it varies, but the technology in and of itself is still really the same, it's more of how it's organized and used.

Mike Merrill:

Okay.

Marcello Sgambelluri:

Yes.

Mike Merrill:

So the term like computational design, what was that?

Marcello Sgambelluri:

What was that? Let's wrap our head around that. It's early in the podcast to start talking about that, but I guess we better do it now to get it out of the way.

Mike Merrill:

Sure. Okay.

Marcello Sgambelluri:

Okay. So this is what's been happening in the industry over the last 10 years. So by 2010, I'm sure most architecture engineering construction firms have heard of the term BIM. So what's been happening for the last, say, 10-12 years is that as BIM started to take hold in a company's culture, and what I mean by that is that let's talk about culture in a company because that's important, and the technology that's integrated within the culture of a company. When I mean company, I'm just talking about every single company that would be involved in the AEC industry. Yes, so it'd be construction, architecture, engineering, facilities management, okay.

So you could have technology in a company and it depends on who you ask, for example, virtual reality, you could ask someone in a firm, and I'm going to use the word firm loosely from now on, means AEC, do you use virtual reality? You ask someone, they're going to say, "yes". But what does that really mean? Does that

mean you've got a headset off in the corner that virtual reality could be used at any time and only a few select individuals know how to use it? Or does it mean that it's fully integrated with the culture of your company? And what I mean by that is that, is everyone on board with it, from marketing, to management, to sales? Are they fully aware? Could they at any point in time give someone a talk about exactly what it is? Could a report be written on it? Could it be part of your statement of qualifications and you're marketing material? It's culturally integrated. So that's what I mean by culturally integrated.

So if what I've noticed over from 2010 on is that "a lot", I'm going to put a lot in quotes, "a lot" of firms have integrated BIM culturally in their offices. So when you do that, you start to use BIM to its fullest potential, meaning you're now producing drawings, whether they're shop drawings or whether they're construction documents for design, and the backbone of them is done off of BIM and the BIM technology, meaning you've modeled it in 3D, you've had smart elements, you're coordinating with other team members on the project, you're producing drawings from it, and then also your marketing groups, your principles, everyone is involved with this process.

Mike Merrill:

Okay. So are you seeing a lot of companies that have that integrated into their culture to that degree?

Marcello Sgambelluri:

Yes, I'm going to say larger ones for sure, larger ones for sure. Smaller ones, smaller companies, and I can't quite define "small", but smaller companies tend to not have it as integrated in their culture. So now we just talk about the integrated with the culture. Now the larger firms that have this integrated with the culture are using it to its fullest potential. At that point, companies are starting to look, okay, now what? What else can we do? So what's been happening over time is that now that it's fully integrated is companies want to customize BIM, they want to change it and tweak it to their workflow. I mean, we can go in a bunch of examples like, out of the box BIM maybe does one thing, but they want to tweak it to do more for their company, right.

So this “tweaking” tends to happen with customization. And customization, since we’re in the 3D digital environment, comes along with programming. And so what we’ve seen over the last 10 to 12 years is that individuals and companies have become their own software developers and they’ve started to customize BIM and make changes to it. It was a little more cumbersome early on, I’m going to say early on 2010 or so, because to customize you had to do a lot of text coding. But what’s happened since 2014 and on, is visual programming has become a big part of our industry. So Dynamo, Grasshopper are those two big buzzwords, that means that you can now take text coding and make it visual. And when it’s visual, then it’s a lot easier to learn and implement. So what’s happened is, as visual programming tools came on board, more and more AEC professionals have become programmers and they’ve been able to make their own programs at an exponential rate compared to what has been done early on 2010.

So now with this integration of many individuals becoming programmers in a company, with these easy visualization programming tools like Dynamo and Grasshopper, what’s happened is that BIM becomes expanded and becomes more, I guess, enlightened, and so you can customize, you can do all these things. And then the next level from that, which is not just customizing BIM, is using something called computational design. And what that really is, is basically a way to automate, is a way to customize, is a way to do quick calculations, basically, on your BIM system through programming. And so computational design is just the next evolution of BIM. The reason it is now a big buzzword is because you have so many individuals programming, you have so many people using visual programming it becomes a lot easier to do. “Computational design” has been around a while, it was always possible from the early 2000s, it’s just that it just didn’t become mainstream buzzword until these easy programming tools came online.

Mike Merrill:

Make sense. So how does that vary from generative design?

Marcello Sgambelluri:

Okay, generative design is just a byproduct of computational design. So generative design, so basically you’ve got computational design, and under computational design is generative design. Generative design is just a way of creating quick iterations of designs to generate designs using programming basically is what it is. So it tends to give you, you can plug in different options and then through programming, through this computational design, we’re calling it, basically, I think of computational design as design using computation is what it is.

Mike Merrill:

Self descriptive, yes.

Marcello Sgambelluri:

It is, it really is, because they’re like, what’s computational design? Basically, you need programming to make computational design possible, just like you needed smart elements to make BIM possible. So it’s a similar thing. So it’s design using computation. So if it’s design using computation, generative design is just one of the aspects of it.

So generative design basically says, well, I have all these parameters, maybe I want to make a building a certain volume and it needs to fit on this space. And then so generative design can go through and give you all hundreds, thousands, tens of thousands of different options of the way the shape of the building could be based on parameters you put in it, and then it helps ... What it does is it speeds up the manual process, because normally what you would do is you would say, well, it needs to be this volume or this area, so I’m going to change this length and change that length. And then I’m going to run it through my design and I’m going to see the result. Okay, now I want to change this length and that length. But you can do that through programming and computational design. And then basically that’s generative design in a nutshell. It’s a lot more than that, but that’s in summary what it is. I know I’m going to get in a lot of trouble for simplifying it.

I get in a lot of trouble, Mike, for simplifying things. People tell me all the time I’m over simplifying things. But in reality, I think things are sometimes a little too over overcomplicated, so I try to break it down and

make it simple. So that's my simple explanation on what it is.

Now, the question is, should you be doing generative design? I don't think it's for everybody, but what I think is happening in our industry is if you're not getting into BIM then you're going to need to get into BIM. And then eventually, you're going to need to get into computational design, because you're going to find, when you're in BIM, you're going to need to modify, you're going to need to change, your workflow is going to need to be a little different. And then at that point you need to customize, and when you customize, then you're going to need to basically use programming do that. And then that basically in a nutshell is computational design.

Mike Merrill:

So where does visual programming play into to those two other aspects?

Marcello Sgambelluri:

Yes, so if you're using BIM, for example, let's just use some concrete examples now and less hand waving. Let's say for example you're using TECLA to model all of your structural framing and then you're ultimately creating shop drawings out of it, right. Well, let's say you need to get the top of steel of all the roof beams and report it to whoever, maybe the structural designers so they could verify it or whatever, right? So you are using BIM at that point, TECLA definitely is BIM, it does have smart information, it's 3D modeling, it does have the ability to coordinate, so it does meet those general BIM requirements. So I would argue that, yes, you're using BIM if you're using TECLA. Okay.

Now, you have two options, one, you could manually go through every top of steel and start writing down manually every top of steel, and then put it in a spreadsheet and email it to whoever needs it, right. You could try to generate it through some report through TECLA, and I'm sure there's some savvy ways of doing that, or you could say, you know what, instead of doing that, I'm going to customize this and I'm really specifically looking at this particular parameter or property or something, so I'm going to actually program something to automate that, right. So now you have a chance to program.

Okay, do you know text programming? Do you know C# coding? Do you know visual? Do you know Visual Basic? Or do you know .NET Programming? Well, if the answer is no, then you can be like, okay, well, then I have an option to use visual programming, maybe Dynamo or Grasshopper, where basically, and I get in trouble for saying this, but it's basically a boxes and wires. Can I place down boxes and wires in a certain organization to extract that information for me? And chances are you're going to be much more successful if you have no programming experience to put down boxes and wires to be able to get those tops of steel out, be able to write it to an Excel file, and be able to distribute it as you want. So that's just a specific example of how you do that, and that's just one of tens of thousands of things you could do to just make your life easier. And maybe you just save one hour a week, but maybe that's one hour a week for one individual over a whole year it can really add up.

Mike Merrill:

Yes, I actually appreciate this simplification of you breaking these things down because I think the general public, even in construction, even construction professionals, they hear the word BIM, they might know what the acronym means, like you explained at the beginning, they have a sense of what it is, but I don't think that a lot of companies necessarily dig much deeper than that.

Marcello Sgambelluri:

I think, Mike, the reality is, I think a lot of construction firms in this day and age probably use BIM but they don't know it.

Mike Merrill:

They don't know it.

Marcello Sgambelluri:

Well, I mean, and that's a good thing, right? It's almost like it's just integrated in the culture. Do you use Revit? Yes, we model grid lines in Revit. Yes, we lay out our structural framing in Revit. Okay, well, then you're using BIM, you are a BIM user, get it on your statement of qualifications, you are a BIM user. You use TECLA? Yes, well, we sort of use it, we use it to extract 2D plans

and then we lay everything out in AutoCAD. Okay, but are you using TECLA in some way? Yes. Okay, so now you're using BIM, right. So I don't think it has to be something extremely complicated to get "into BIM". And then a lot of times what happens is if you're like, well, we're already using TECLA or we're using Revit to do little things, well then maybe you take it a little step further.

Here's what BIM is really, that's the acronym, building information modeling, but what the paradigm shift was back 20 years ago, was going ... Let's back up even further, from the Renaissance I suppose, we can go that far. Hundreds of years ago, in order to express your ideas on paper is things were simplified, designs were simplified to be represented diagrammatically on drawings, plans and elevations, basically, for hundreds of years. Then maybe you could argue early 80s, mid 80s, the ability to replicate that digitally through AutoCAD or other CAD means, which stands for computer aided design, which really meant you're basically taking what you did on drawings and just replicating it digitally. Now that was important because you can make changes quick, you could use an Undo button, you could snap to centers and endpoints and stuff like that. So it made the drawing easier and you could do some repetitive task copying lines and things like that.

What BIM did is it flipped all of those concepts on their head and says, instead of trying to represent things with lines, let's actually model in three dimensions the actual element, so it has the true length, the true size, the true property, maybe even the right material property, has the right connectivity. And then through doing that, it writes it to a global database that's hidden in the background. So whenever you see a view of it, of that particular, let's say it's a girder, a beam connected to two columns, let's say you want to look at that girder in a 3D view, well all it's doing is referencing that database and displaying it in 3D. Well, if I want to see it in 2D on plan, it's not a different beam like it would have been with AutoCAD, it's the same beam referencing that global database.

So what BIM has done is it has allowed the industry to not have to worry too much about doing things twice. So if you model it in 3D, well now you have a plan, now you have an elevation, you don't have to do it twice, right. But not only that, but since it's represented in 3D,

now you can do coordination, you can overlay that with the structural model. Is there coordination issues? And so that's really the beautiful benefit of BIM. And I think, like I said earlier, I think a lot of companies are using it and they just don't know it.

Mike Merrill:

Right. Yes, so a simpler term would be digital clay. Basically, that's what it is, right?

Marcello Sgambelluri:

Yes. Yes. I suppose it's digital clay, although I think some architects would argue that's not what-

Mike Merrill:

They don't like clay.

Marcello Sgambelluri:

But I think, I think, I think that's fair.

Mike Merrill:

So you mentioned earlier VR, so where does VR play into everything that we've talked about so far and how is that utilized?

Marcello Sgambelluri:

Well, VR or virtual reality is just a fancy way of viewing and sometimes interacting with your 3D digital models. So it comes in really handy in certain situations like if you want to ... What's nice about virtual reality is that you no longer have to just visualize your, let's call them projects, on the flat screen, on the computer, you actually have the ability to visualize it as if you were physically in that space.

Mike Merrill:

Walk through it, right. Yes.

Marcello Sgambelluri:

Yes. And quite honestly, there's a lot of really nice things that happens with that. First of all, it's a lot of

fun to use. In fact, I've got a VR system here, that's one of my VR sensors there.

Mike Merrill:

Nice.

Marcello Sgambelluri:

Those are light sabers if the viewers are wondering, by the way.

Mike Merrill:

Yes, right.

Marcello Sgambelluri:

A bit nerdy to have those, but hey, that's okay.

Mike Merrill:

I thought they were ninja swords or Katana swords.

Marcello Sgambelluri:

Well, I suppose you could argue that they are.

Mike Merrill:

Digital Katana swords.

Marcello Sgambelluri:

So what virtual reality does is allows you to physically step in the space, and it's a lot of fun. And a lot of times it's easier to visualize and realize a space when your brain thinks you're actually standing there. So a lot of times what we'll do at my structural firm is, when we're done modeling large portions of the structural portions of a project, is we'll go into virtual reality and do just one more quality control sweep. And it's like a lot of times it's just even just for quality control, if you're looking on a flat screen at a bunch of elements and you're not physically in the space, sometimes things don't look off. But when you're physically standing there with the virtual and it hits, and you're standing on a roof and you're looking at all the beams, and then you see this little shadow being cast and you're like, what's that? And you walk over there and

you realize that the beam is up just a bit because it's casting a shadow a little differently.

So your brain thinks you're there and then you find these little things that pop. And I like to equate it to, if you saw a circle and it had a little notch taken out of it, you'd be like, that's not right, that's not a circle, right? I mean, but we know circles are supposed to be completely round and continuous, right? But when your brain is in a project and you think you're there, then you see things that just you normally wouldn't see in the flats, at least I don't. And it's fun to be there.

And so virtual reality allows you to do that. It uses game engine technology, which then also allows you not to just look but in certain situations you could touch. So if you need to, you can collaborate with others, you can see someone else in that environment and you could talk or you could paint over things. And then even in extreme cases, which I've seen, some elaborate, let's say, programs allow you to physically move things. So if don't like that particular furniture there, pick it up and move it in virtual reality. And so you have the ability to not just look but touch, which is really cool.

Mike Merrill:

Well, and I think I'm gathering, as you're discussing this and as you're talking about the technical side of companies, and programmers, and people embracing this more, it's becoming more mainstream to where maybe one day in the not too distant future you can go to the furniture store and have a similar experience and vision this couch in your space or this bed headboard and whatever.

Marcello Sgambelluri:

Yes, sure. And it's already happening. I mean, if you buy something on Amazon, there are some products there they'll say, view this at home, or I can't remember the option, and you can click it and then it will actually show the object in ... that's augmented reality, but it uses the same concept. You know what, and quite honestly, I am not the, I guess, the digital reality expert, but you may hear these terms of virtual reality or VR, augmented reality or AR, the only difference is that augmented reality means that it's digital overlaid with the real environment. So if you just want to have one

object but you're overlaying it with the real world, then that's augmented reality. They also have a term called mixed reality, which is in between. And I think there's others which I don't quite understand. But anyway, as long as you hear the word reality on it, it's usually meaning that there's some digital thing involved with tricking the brain to think that it's actually there.

Mike Merrill:

So what is a digital twin and where does it play into this conversation we've been having?

Marcello Sgambelluri:

Digital twin, okay. It's still early in the podcast to ask that question. But okay, digital twin, we need to ramp up for that one. But let me just finish my virtual reality soapbox rant, if I want to. A lot of times with virtual reality, if companies are looking to get into it, it can be a hard sell because the equipment is expensive, but really you just got to let people try it. And then when they try it they tend to be hooked because it's cool and fun. And if you're using virtual reality and you're not having fun, you're probably doing it wrong. So we're just going to have to leave it at that.

Also, it's not an unknown concept to us as humans, virtual reality. Virtual Reality just means that we're tricking the eyes to trick the brain to think that something is there that's not there. But we've been doing that with all our other senses for tens of thousands of years, right. I mean, when you hear bird sounds at a museum and it's playing through a loudspeaker, I mean, that's a virtual reality just through your senses through hearing, but somehow we accept that as just being part of normal life. So the fact that we're tricking our eyes now to trick our brain to think something's there is only just another sense that we're using. I mean, you could even argue drawings and, I mean, it's all some augmented reality of some type to trick our senses to think something's there. So this is just the newest wave of that. I think, I think in 20 years we're going to laugh at all these big headsets that we were wearing to trick our eyes, when in fact we'll come up with better systems for that.

Mike Merrill:

Contact lens.

Marcello Sgambelluri:

Yes, whatever it may be. But yes, so I think it's here to stay. I don't think everyone would have a virtual reality headset on at all times 100% of the time, I don't think that's important. I think just at this point in time it's good to get in there and see your designs and realize them in a different way. Okay, enough on that.

Digital twin. Digital twin concept has been around a while. Now, what does digital twin mean if you just look at the definition? Does it just mean that it's a digital twin of the actual building? In the definition itself, yes. So if you had a project that was existing, say, or you designed a project in BIM, you model it in three dimensions, and if you were to look at the project that got finished and constructed, and you were to look at the constructed project, and you were to look at the 3D model that was built, and if they look identical or they look like twins, is that a digital twin? By the definition of the word, the answer is yes, but you would say, well, haven't we been doing that with BIM all along? Isn't BIM a digital twin? What is the difference?

Okay, there's a big difference, and the big difference is the process. So I like to think of it this way, digital twin is not a thing, it's a process. So if you're like, do you have digital twin on the project? Then you go, yes, we've got BIM, we've got the project, we've got a digital twin. No, it doesn't work like that. So I think that's the misconception. But digital twin is the process on how you use it. Now you can say, well, we've been using BIM, we use a 3D BIM to organize, and coordinate, and extract information from, so are we using the digital twin in the right way? What the term digital twin is supposed to mean, and I'm not the digital twin expert, this is what I gather from the industry and what I've done personally, is digital twin really is the way you use the three dimensional model after the project has been built.

So you build a 3D digital model for your design, your coordination and maybe even to help the construction, that's not really part of the digital twin process. Building is now built, okay, the building is built, right, you're like, how many sensors do we have in that building? We need to change them out and when do we need to change them? Okay, go in there and count all 5,000 of them. Or could you go to a digital 3D model, which would be the digital twin, and go in there and count up all the sensors, put in data in there on when

it needs to be replaced, and then so now as the project is moving along, it gets older and older, you don't go physically into the building all the time, you go to that digital twin and you use the digital twin to support what you're doing to the facilities management of the building.

Now, the digital twin experts and academics are probably going to say there's a lot more to it than that, and there is, but I'm just trying to simplify it in a simple way. So I guess if what we're saying is, if a project requires you to do digital twin and you were just using BIM in the traditional sense, then you're not going to be able to satisfy that requirement. So what I think I'd recommend to the listeners, if they're hearing this, is if you have a digital twin requirement, then you need to ask exactly what that means. What do you really mean by that? You ask the owner, if they're requiring it.

Okay, it means that when the project is built, we have an exact replica as built and it is functional in such a way and in a format in such a way that the building facilities management, maybe us as the owner in the future, we can all access that project, we have the ability to do it, we have the skills to do it, we know exactly what to look for it, maybe even you put an extra things in there so that it even reads real sensor data. Sometimes building have sensor data, that digital twin is actually monitoring that sensor data. Maybe it's a movement in an earthquake, maybe it's the electricity that's running through it, maybe it's the age of the sensors or you know what, it could be so much stuff. But it's basically using it as the twin of the actual building.

Mike Merrill:

Great explanation. I love your descriptions and how you're bringing this back down to earth, right, where just the regular Joe contractor can get a sense of what some of these specific terms are. So how does somebody that really isn't leveraging these things fully start to utilize BIM and digital twin technology and these other things in their business?

Marcello Sgambelluri:

Computational design?

Mike Merrill:

Yes. Yes.

Marcello Sgambelluri:

I think the first thing to do is to assess where you're at, because I think I've been in the industry for 23 years now, and one thing I realize is that our industry is full of extremely intelligent AEC professionals, and a lot of them sell themselves short. So I think when they hear the term digital twin, computational design, BIM, their immediate reaction is, well, I'm not using that. But are you? And we talked about this a little earlier, right. So what I would recommend to everyone who wants to get "into it", whatever that new technology is, do an evaluation first of where you are, a real evaluation. Are you really using BIM? You probably are. Are you using computational design in some way? You might be but you don't know it.

As an example, you may be getting Revit models from an architect, the architect laid out all the grids, everything out using computational design, maybe a Dynamo script. Well, maybe you find that out. Okay, well then what you do is you say, hey, could you share those scripts? Could you share the computation that went into creating this "digital thing", let's call it a digital thing, right? Maybe you have subcontractors who wrote little LISP routines or scripts or something to help do it, right, maybe you want that as supporting it. So that way when you do a full evaluation of where you are, you need to realize what you've already done and what you're involved with. And that will give you a good idea of where you need to go, because you don't want to have to relearn things that you already know that you don't know, if that makes sense.

So then do a full evaluation, I would say, and then if you realize that you were doing something that you didn't know you were doing, meaning through these terms, then you probably should be updating your website, your statement of qualifications, you should be bragging quite honestly about what you're doing, because what I find is that in this day and age, technology just wrapped everything in our industry. Even if you're out there tying rebar, right, you are involved in a digital process that got you to that point of where you need to place that rebar, et cetera, right. So technology is a huge part of our industry, it just is.

And with that, you need to be a technology evangelist. So you need to be telling everyone in the project what you're doing from a technology standpoint. Maybe you wrote a little script to extract, like I said, all those tops of steel, maybe you think no one cares, probably people will, right. You need to be telling the owner, you need to be telling the architect, and you need to be telling the subcontractors all the technology that you know and what you're doing. So you need to do a self evaluation, you need to do a realistic evaluation, you need to then be the evangelist for what you're doing.

And then at that point, you could then branch out and say, okay, this is really what we need to learn, we really need to get into visual programming around Grasshopper, because for example, every time we start a new project, we always get a Rhinoceros file, which is another 3D modeling program, from the architect, and we don't have to remodel this all again. Okay, let's now decide to start to figure out how to utilize that technology to make ourselves a little better. And so I think self evaluation and then doing baby steps into the technology that you think will help either the project you're on or one you see in the future, then it becomes more real. You don't want to look too far out like, well, in 20 years let's do some fictitious, esoteric project that may be in the clouds one day, no, I don't think that's going to help.

And then you can dig your roots in, save some time and then you branch out again, okay. When I say a self evaluation, I mean, self and project evaluation, because you may say, well, we only use this and that. So yes, we're using TECLA, and yes, we're using AutoCAD imports, but maybe you didn't realize that the designers, the structural engineer, the architect, are actually using all these other technologies that you happen to not really know about but you're physically touching because you're getting byproduct of that. Well then you need to ask, right. And in our industry, we're not that good at that yet. We're not that good at project teams sharing everything they're "doing". They're good at sharing what they're required to share, but they're not that great at sharing what they're doing and I think we will eventually get there but we're not there yet, so how do you know? You got to ask.

And believe it or not, a lot of our industry is filled with tech geeks. I mean, I'm one of them so I know. So you could just spark up a conversation, well, how did you

lay out all those grids? Wow, you've got 500 of them and you gave them to me the next day. We used a script and we ... Really? Well, you share that with us. Of course. And then through that you start to realize what your project is doing. And then you can learn without even trying, you could learn what's going on in your project. You could adapt those technologies in at least you can start to think about, I saw how this was utilized and then you can start to be the evangelists of that. Even though we weren't directly involved in it, this project utilized this technology and that one, and then I think that's the easiest way to start to absorb it because it's real.

And then you may decide, you know what, we want to do that thing that the architect did or we want to do that thing that our subcontractor did. Yes. And then from that point then you move on. So I'm going to call it self evaluation, project evaluation, evangelist and then reach out. I think that's probably a good place to start.

Mike Merrill:

Great answer and a lot of great detail. I really love, I mean, I'll put a different term on it, but this is marketing. There's a marketing opportunity for businesses to not just brag about and share, but evangelize how these buildings are being put together. And whether they realize it or not, they are using BIM because they're being blessed by BIM even if they're not the owner of the system, they're enjoying the benefits of the process.

Marcello Sgambelluri:

Right. And you should "shout that from the rooftops", because you were an integral part of that technology to make that project successful. Even if you, maybe as a contractor or subcontractor, we're only laying out slab edges, right. But really, where did that come from? Where'd it go? And then where's it going? Maybe it's going to be part of a digital twin, maybe it's going to run sensors in the building that will last for 20-30 years, right. So it's good to ask.

You know what I'm thinking, you know how projects ask for as builds, right, we could do a whole podcast on as builds, right, there should be as builds but part of the as builds should also be a summary of as designed.

Like, how was this as designed? What processes went through this to get here? I think that would be a nice solid document too. I don't see anyone in our industry really doing that from a big picture view. I mean, I think I've seen that through BIM execution plans, but BIM execution plans are more of, this is what we need to do, but a lot of people, believe it or not, even with a follow up BIM execution plans, if they follow it, first if they read it then if they follow it, will do a lot of things other than that. And it's those things other than that, that I think really should be known to everyone in the project. I guess that's what I'm saying.

Mike Merrill:

Yes, I'm visualizing a navigation route on GPS, I mean, you got the destination, you got where you are, but turn left here, turn right there, go around this corner, merge here. Basically, you're talking about the steps it took to get from point A to point B and documenting it.

Marcello Sgambelluri:

Yes, I suppose. Yes. And I did a talk at Autodesk University on a similar topic, it was basically, what I think is really good and it's been real good over the last 20 years is, like I said, companies and firms that are in a project are really good at sharing what they need to share, and that usually is around digital models and drawings. But they don't think about sharing their intellect or their wits, but that's a huge part of a project, right. And so I had that discussion group and what I'm trying to promote in the industry is to do more of this. And it could help the design or it can help the project on the future.

So for example, the contractor says, we need all the digital models from all the designers, so we could then start to create our shop drawings and do our construction. Okay, say that's a requirement, right. Well, the designers are going to hand over their models because they're required to, and sometimes even if they're not required to they do it. But a lot of times they're not thinking, okay, you know what, let's also share all the other stuff that we did that led up to the creation of the model. And then even on the design side, I'd like to see more of that exchange of wits.

A lot of times there's overlap, structural engineers and architects. The structural engineer maybe designing

all the exterior retaining walls, but the architect is modeling all the soil and the topography, right. And then one's required to do one thing, one's required to another, but a lot of times one firm will have a unique skill set that the other one could use. For example, you may have someone in the structural office who knows how to model typography better than anyone else in the state, but the architect may not know that because they're not telling them that. But if they told them that, hey, we've got, whatever, so and so over there knows how to do this, would you like them to share that knowledge with you so when it's your turn to model it, it's going to be easier? And I think this whole sharing of wits things could really benefit an entire project anywhere on the level.

So I think that's what we're driving down into is, being able to share that. And it's traditionally not what we do because you're like, well, why? And then from the other side of it, it's like, well, why are we getting help? When we're required to do it, why are we asking another consultant to help us do that? It's like, that's our job. But a lot of times when it's your job, it doesn't mean that you can't ask for help, right, or you can't give help or offer help. So I think that's where we're going to.

So maybe as you do a self evaluation, you're looking into this technology and you start to branch out, also do a self evaluation of what you think team members could benefit from what you know. Maybe you're the expert at documenting all the precast concrete panels, right, but it's not your job, but you could probably share that with someone else on a project outside your firm and then they'd be able to be a little bit easier at it.

You know what, I like to think about it too, sorry, we're flying off topic here, Mike, but what this does, is this sharing, this evaluation that's helping the sharing of wits, is it creates this culture around your project and around your company, and hopefully, around the industry which is not this finger pointing, well, it's your fault when a problem goes wrong. It's your fault. It's like, no, it's really all of our faults but it shouldn't even be that, whose fault it is, you shouldn't be asking that question. And I think a lot of times when you bring things up it's like, well, why are you asking? Or we don't need your help.

Mike Merrill:

Yes, defensive.

Marcello Sgambelluri:

Yes, and you know what I like to say is, if that happens in a project, like, well, why are you asking me? And it's this defensive way of doing it which tends to be more of paranoia, like, well the reason you're asking me is because you're trying to ... there's something negative you're going to do, right. But I like to flip it on its head and I'd like to see more of the opposite of paranoia is pronoia, which is, you have this delusion that everyone's trying to help you. And so that's what I like to see.

And I've seen that in some projects, that's what I would like to see in every project. When someone says, hey, do you want to learn how to model typography? I know how, I can show you. Yes, great. Not, why are you asking me? But I know you're asking me because you want to help me. Yes, come on, spend a day over here, I'll buy you lunch. Whatever, it's this whole pronoia type of attitude and culture that I'd like to see more and more. And I think we'll eventually get there, but I think it all starts with sharing your wits and your knowledge and everyone working together on a project. And I have seen it here and there. Okay, I'm done, Mike.

Mike Merrill:

Love that. Well, so to wrap up, one last thing. So if I were to ask you, what's the main takeaway, one short, succinct takeaway for the listeners, what would be the parting thought you would share with them from our conversation?

Marcello Sgambelluri:

What do I want everyone to take away? I guess what we just talked about. Mike, wait, how about this, Mike, what are you taking away from what I'm saying? How's that sound? What are you taking away from it?

Mike Merrill:

Well, what I'm hearing you say is that we are leveraging technologies that we may not be aware that we're leveraging and we need to better understand what those things are, so that not only can we take more

advantage of them, but then we can also share that message with others so that we can raise the bar for everybody.

Marcello Sgambelluri:

Right. And these technologies will continue to grow, there'll be more and more terms. Maybe if you invite me in a year, I'll have more terms for you, right. So I think that's it. I think, don't sell yourself short, right. You're probably doing a lot more than you think, you're probably doing a lot more intelligent work than you think. And share what you have and keep up the good work, I think that's what the message is here, because we're doing something right. I mean, projects are being built all the time, right, we're one of the biggest industries on the planet. And maybe if you need help communicating, reach out to Mike with his WorkMax platform and he can tell you how to do that.

Mike Merrill:

Well, thank you, Marcello, for joining us today. Really enjoyed the conversation and look forward to sharing this messaging and also this episode with our listeners.

Marcello Sgambelluri:

Okay, thank you, Mike. It was really nice talking with you.