

Michael Porzio Fabrication Welding and Design
Advisory Board 2026 Spring FWD

00:00

Jim: last year I had it on my calendar and I just totally spaced it.

Michael: Don't worry about it. I really appreciate you jumping in for this one. Okay. Thank you. Long time no see. How are you doing?

Jim: Good thanks. Good good. I'm just waiting on a couple more people. Thank you for being studious on time.

00:22

Michael: I got a lot of new faces on this call so ah they'll have to introduce themselves I only just recently reached out to them different welding associations and stuff

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How's things on the ABB front? Good. Good.

00:58

I am, yes. So if it wasn't already obvious, uh I instruct manufacturing, welding and design at RTCC. So ah in this class space, we learn how things are put together. We take things apart. We figure out why things are made to the cost and requirements they are. And then we get certified in a whole bunch of different tools. So it's primarily like a uh high school. uh

01:28

senior and junior level class and students go on to like higher education from here. So it's a tech school. Yep. What does RTC stand for? It's Randolph Community Tech Center. Okay. In Vermont? Yep. Yep. Not too far from Barry where I used to work at, Philibot.

01:53

It's actually like five minutes away from my house, so it's a nice commute. with the gas prices right now. Oh my God. Crazy. Where are they in your neck of the woods? About 410. OK, so yeah, 420 here. So it's about the same.

02:12

Where is everyone? I have so many green arrows for being here. People were very adamant about wanting to be part of this, but give them another minute or so. It's going to be a pretty fast meeting if it's just the two of us.

02:38

Well, I don't want to keep you waiting. I'll start and if they pop in, I'll just recite what I did. We can give them two more minutes, that's fine. You sure? I got a glass of wine, half an hour, I'm sitting

at my desk, my wife's in the other room doing yoga, I'm good. That sounds like a good time. I'll give you two minutes then.

03:28

Oh, I got an email from Nathan.

03:50

Hmm.

04:33

Huh.

04:52

told him to just try calling in if Google wasn't going to let him in. Let's see if that works.

06:07

Alright, I gave him my phone number so he can only just call me and I'll just put him on speakerphone if we have to do that. If that doesn't happen in a minute then we'll just do this quickly with the two of us I suppose. Sure, no problem. I don't know where Rick is though. He should be here too.

06:26

This is pretty common. feel like. Sadly.

06:40

What is Hayward Tyler? That's part of what Nathan is. It's like a welding, fabricating, higher education like school. He'll introduce us to it when he joins.

07:00

Here we go. What's this asking for my email password to login to meeting? I don't accept that central phone for some reason it is not accepting my Gmail password I can tell you

07:22

I had no problems getting in with Google Mates at all. Yeah, I've never ever had an issue. He seems pretty tech savvy when I talk him, so it's kind of weird that he's having so much issue.

08:15

Don't do that, I'll start. Yeah, really.

08:49

When this clock strikes 610, we'll do what we can. If he jumps in, he jumps in.

09:35

Okay, well, I'm not getting any more emails from him. All right, this won't take very long with just two of us. ah Let's see here.

09:47

Alright, so you know who I am. I'm Michael Porzia. I'm the fabrication, welding, and design instructor. ah Would you like to introduce yourself for record?

09:58

Yes, if that's a okay. I'm Jim mail on the territory sales manager for robots for ABD robotics in the northeast. Cool, thank you. All right.

10:12

I just closed out of my draft that has all the questions that I have to ask. All right. All right. So in my course, what we do is we give what are called IRCs. These are licenses so that when students progress out of my classroom and into the working world or into higher education, they carry with them licenses.

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So these licenses are things like OSHA 10, First Aid, we have a textbook called NIMS and in that it has IRCs so you can get licenses on things like vertical mills, drill press, bench layup, that's what we're working on right now. We also have NIMS for SolidWorks, of course. Last year we did CAD, students were, it's very difficult giving them associates in the time we have.

10:59

ah So I ended up, it's more like an optional thing. We have to teach them CAD if they want to move on to all the other machines and especially to use additive manufacturing, which is a big deal in my classroom, you can imagine that I would definitely push for that. So, speaking of which, have, starting from the oldest, we've got an ancient Ultimaker S5, we got two bamboo P1Ss and a Crealty Ender 5 Max. ah But we don't have any robotic arms with 3D printers attached to them, believe it or not.

11:25

which would be pretty cool of course. And then we have a shop space and in that shop space we have all sorts of metal working ah equipment, everything from the vertical mills to bandsaws, drill presses, we have three welding booths with TIG, MIG and STIC, et cetera. Oh, who just jumped in here? Who do we just gain? This is Rick. Hey Rick. It's all right. I was just going over what we have in the classroom and the licenses that I offer here. ah Jim, do you mind introducing yourself one more time?

11:59

And I'm Michael Porzio. I teach this class fabrication welding and design at RTCC ah Rick would you like to introduce yourself?

12:12

Welding Institute in Vermont Non-Destructive Testing. uh

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some more students in the program and expand the program a little bit. Excellent that sounds great. ah I was just telling Jim uh in my shop we have MIG stick and TIG welding. have one booth for each but I'm sure it's tiny compared to what you can offer at your establishment. So Rick do you have AWS certification there? Yes we do. That's very nice yeah that's cool.

12:43

It's not something that our school can actually certify students in. I tell them that if they want to get it, I can teach them what we teach here and then I can bring them to another location to get certified. But in your situation, I think you'd probably be more ideal for that, right?

13:03

We'll go up there for a day and if there's they got students that want to try to get an AWS cert, we'll let them do a test play. Do the visual inspection on it, bring it back to the school, cut it up, bend it, polish it. Cool. See if they pass or not. Very nice, very nice. ah And I believe Nathan is coming out to my classroom on the, I don't have to check the calendar, I think he said the 14th. So that would be great. I think my students would definitely like that.

13:33

Let me go back into my list here. So I was just telling Jim, I offer IRCs here. AWS is not one, but we of course have milling and machining operations that I offer. IRCs, CAD, SolidWorks, OSHA 10, vertical mill, drill press, bench layup, et cetera.

13:54

And I was also talking to Jim Jim and I go back we have a lot of like added manufacturing stuff in our past and that's of course 3d printing We have a bunch of 3d printers here learning solid works and CAD is super important for knowing how to do added manufacturing and 3d printing ah Yeah, so let me look at my list here we got to cover So as

14:20

Your jobs, why I invited you here today, is we need to talk about ah trends in the landscape for equipment that you think my classroom could use ah or things that you think my students could use licensure-wise or just information teaching them. Because these advisory meetings are about informing us instructors, program instructors for our trade, what's happening in the industry and where we can improve on that.

14:49

So if either of you would like to go first and give your opinion, feel free.

14:57

You want to let me jump in there? I was talking to Nate and Lad, the guys from Hayward Tyler Pump there a while back, and I think you'd be shocked to realize what these guys. One second, I wonder if that's Nathan right now. Hi, is this Nathan?

15:15

Good, can put you on speakerphone? me one second. Nathan was having difficulty getting into I don't know what's going on. Alright Nathan, you're here live. Rick was just talking about what's going on in the trades. Go on Rick. Yeah, and I was just talking to these guys about the need for machinists and uh to actually do the real world machining, making the first part pieces and stuff like that.

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you they're pretty desperate they're looking for you know people that can get these guys started and get them a little bit trained and then bring them on to a level where you know these guys that are making these really highly technical parts and pieces uh... you know

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trained well enough to trust them so it's going to come out you know accept the world at the end and it just seems like there's nobody out there right and then in the welding world it's top to bottom there's good welders out there there's bad welders out there and we're trying to put good welders on the street and you know we're dealing with what we get out of high schools and sometimes that's good sometimes that's not so good right yep but you know normally

16:27

Well qualified welder man's pretty good money. Yep Yeah, if I were a tech center right now Investing it's like yeah, and you have the people that can teach it You know machining is yeah, definitely at the forefront and

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pipe welding and welding other metals other than steel, stainless, aluminum. Yep, titanium. That's in high demand too. Ink and L is starting to become our industry standard. Is it really? Yeah. Absolutely. Huh. So we're, designing, uh, several of the next generation nuclear.

17:09

Yep. And they're gonna be all molten salt, molten sodium. So they're turning into like thousand degree, 1200 degree operating temps. Yep. And the only thing that can hold up to ink and L is ink and L right now. And it's, you know, we've had quite a learning curve on how to machine it, how to weld it. Because it is so different than any other metal we worked with. Yeah, because there's no iron in that whatsoever, right? None. None.

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Is it is that also not just due to strength? Is that because of corrosion too at those temperatures? It's absolutely.

17:52

Right, right Yeah, I'm always telling my students there's a difference between it something doesn't have to get red hot far to lose and it's uh Strength and start deforming and you can know is definitely one of those better materials for that Yeah

18:17

Really?

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It's bad. It's bad. I mean, it's.

18:27

Huh, interesting. Now that's, I have, I personally have no experience. Uh, I've never even touched in canal before, so that's interesting. I'll have to get some from, of course it's kind of big bucks, but I'll have to get some for my class and we'll have to mess around with it for sure. We absolutely have some at Hayward.

18:49

That would be awesome even if it was like small samples just so I have a piece in my hand to show my students.

19:16

and the price of VK

19:20

uh I believe that. That's insane. Where does that come from? McMaster car?

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That's very cool. I know in the additive world they're experimenting with 3D printing in canal as well, which is kind of crazy.

19:52

It's interesting from my side, so I'm the robot guy and I still.

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the welder you know robots are done they only do what you tell them to do if you teach a robot to make a bad weld it'll make a thousand bad welds a day exactly like that

20:18

Yeah.

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example you have stuff to maintain your tungsten. If you're welding with MIG you still have to make sure all your consumables are good and it requires somebody who knows what they're

doing to not only set up the robot but to manage that robot and the production from that robot in use. I think where robots have been good because you know

20:48

the 800 pound gorilla when it comes to who buys welding robots, right? um But in New England, we have a lot of aerospace and a lot of government DOD type stuff and a lot of R & D. So I do see a lot of ink and oil welding and I see a lot of really thin material, know, high exotic material welding. So we do a lot of robotic TIG up here, for example, which, you know, you don't see as much elsewhere. um But the first thing you got to do is know how to weld.

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rather take a welder and teach him to run a robot than to take somebody who knows how to run a robot and teach him to weld.

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getting to the point where the robot is need to program and you know that has come a long way in even the last five years and now with AI you're gonna see really rapid advances in ease of programming with robots with automation over the next five years so I think robots are getting not dumbed down but the

21:54

interaction with the robot is getting pulled down to the point where you don't have to have a \$90 an hour robot programming technician to replace a \$30 an hour welder. You know, you can teach that \$30 an hour welder how to run a robot just fine. But instead of, and where I think that really has an impact, when I go into most of these companies, the reason they want the robot is because they can't find enough good welder.

22:24

And what they can do is they can take their good welders and they can use the robot as a force multiplier and they can have the robot do things that are sort of the mindless repetitive welding work but supervised by a welder and that frees up the welders to do things that the robot can't do. Right and there's lots of things the robots can't do. Well, mostly one of the things with robots with becoming easier to program is

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It's getting easier to do what they call mass customization where you can have as little as what we call lot size one. So it gets to the point where it's almost okay or you can almost get away with taking the time to program the robot to weld one part. That's scary. Here I am, I tell my students, I'm like, we're not at the point yet. See, a robot can never do one thing. It's for mass production. But here you are telling me that we're not there. The teaching tools are heading.

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it might be worth teaching the robot to do that. Now, what else?

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It's, you there are fumes. You can weld in bad environments. You know, so the robot can do things. You know, the robot doesn't get fatigued holding the torch, right? So the arc on time is very high. So again, for large volumes, when you have a lot of arc on time or a lot of weld beads you gotta lay down big pieces, the robot has an obvious advantage. I think.

24:07

smaller things you robots are very very repeat if you teach it do it once it'll do it again okay so that could have an advantage with critical parts and things like that but it can take a long time to get the robot you know if i go into a company and they're welding ink canal so just did this i went to an aerospace company and they're welding these ink canal

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parts that are part of an exhaust system for a jet engine. And they're very curvilinear and oddly shaped. You're going to have to give me a dozen parts to play with until I get that dialed in. I'm going have to build fixtures, and I'm going to have to train that robot. And it's going to take a lot of parts before I get an acceptable part.

25:01

It isn't always just as easy to program the robot as I was saying before it really depends on the part right but Robots are getting more accessible and easier to use and the cost has come down a lot So I think you'll robots aren't going away and I think for your students Exposing them to some kind of you robot programming education is probably a really good thing It's not that I'm trying to replace all the welders. No

25:29

think if you talk to the American Welding Society said that there's going to be something like a 45,000 welding jobs that won't be filled for lack of welders to fill in America. That was a couple years ago. So I imagine it's worse now. It's way worse now from what we've been told. Yeah.

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So robots can help and they can do the grunt work, they can do the grudge work.

26:03

certified welder, know, if you're working in a shipyard, for example, it's really hard to bring big things to the robot, right? So the robot is a stationary device. It's much harder to bring the robot to the work. So as soon as you have, you know, if you're building a skyscraper, you're going to need welders that can climb steel and

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and do that work because you're not going to be able to get a robot that can climb steel. Humans are amazing in what they can handle. If you can get the steel beam to the robot cell, then the robot will do

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What's interesting is we have a company that does weld steel beams, but when you're talking about a building or a bridge, every beam is a little different. Every single beam is unique in some way, where it tees off, there are connections, where there's whatever. So the ability to use CAD drawings, for example, to import those drawings into a robot program and to be able to generate

27:14

is really important. that, like I said, that's come a long way. We've got some really cool tools for stuff like that. Cool. Thank you, James. Things like vision to be able to actually scan a part in real time and then have the robot figure out how to weld that part without a lot of human interaction. You know, that's come a long way. And there's some really cool stuff out there I can send you information on. Yeah, that would be very helpful. Do you foresee or do you know of any, what is a realistic

27:42

Cause of course budget is always a huge thing that we have to fight. So do you know of anything that is either the smallest cheapest option for something like that to get my hands on used or is there like a simulation that I could run on computers for that?

28:02

Okay.

28:06

And I'm gonna, can I share my screen? I think so, I'm not sure. that possible? I've not given people permission, but you can, let's see. Here we go, I wanna show you something real quick. You said 3D, you said.

28:21

See you soon.

28:25

Let see if you can see this. Can you see the screen here in a second? I do, yep. I see that. Hey, that's mine. I designed that. This is a company in Vermont called Massive Dimension, and they're actually up in Berry. And they make this system for 3D printing. This is plastic 3D printing with a robot. Yep. And this is a collaborative robot that does really, really good 3D printing.

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This is a great way for students to learn about robot programming and offline robot programming and how to use CAD diagrams to bring in to print things. So this is a great uh tool in the classroom for teaching robotics and for teaching additive manufacturing. Yeah, the MDoc1 is excellent. I try to get a quote from Massive Dimension. They are, of course, pricey. ah

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If we get grants next year, maybe we can afford one. That would be cool. Cause I agree. It's like the.

29:33

Yep.

29:38

parts that are 10 % over that you've been machined. So for example, with the material you were talking about before, like the Inconel, it's really expensive to get a big block of and have to machine away 90 % of that to get the part that you want. It's painful, Whereas if you can build it with 3D, if you can build it with wire.

30:00

And then just machine away a little bit of it to get the parts that you want. It's actually very cost effective. So that's another really, I think, up and coming and a use of robots that you're going to see becoming... Meltio, for example, is one of the companies that does that really, really well and somebody we work with. So Meltio builds these really cool laser-based or MIG-based 3D printing cells with metals. I can tell you the other... Yeah, Nathan?

30:30

going to say the other big benefit to the additive manufacturing with

30:43

Hmm.

30:50

Super crazy material not cast iron uh The speed and price are actually the price is similar The speed is like a third of the time and when they were running defects through it The casting had like 10 to 12 defects in this massive Pump bell that they were doing and there was three in the 3d welded part The amount of time you're spending to repair the quality of the part you're getting Which is a huge cost in my world

31:19

is also a huge factor in the additive welding side. Yeah, because a post-process is always, I mean, casting or 3D printing is always post-processed, right?

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So the ability

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you know.

31:51

get something cast can be pretty arduous and you don't want to make the molds because the molds can cost a lot of money. It's huge money and 20 weeks to get one. Yeah. Right. So we are doing that.

32:09

is one of the biggest things for the future. I mean we're making, we were looking at a from Lincoln a 3D print.

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in a 12 foot.

32:38

So, you know, weld something up to a certain point where there's some really weird geometries that would normally be buried in a casting. Yep. We can then machine those to what we want. Then send it back into the weld process.

32:55

They were talking.

33:00

Basically flip the lights off and just let it run. Just put a drum of wire in front of it and let it roll. We have a customer that's doing a lot of that in Massachusetts and they're making parts in 30 hours as opposed to the 20 weeks. I'll share my screen again real quick. Sure. This is what we call our Wham cell.

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So this is uh what's called a wire arc additive manufacturing cell. And you can see there's a robot here sitting on a pedestal and a positioner sitting in front of the robot. This time it's not sharing, Oh, this time it's not No.

33:52

It sure is now. Yep.

33:57

So you can see the robots here and then there's a positioner here, which is a two axis positioner. Yep.

34:05

is about a one meter cube. That's this robot positioner, you could print something up to about a one meter cube. This whole cell costs less than \$200,000. Yeah, that's impressive for that capacity. that's really impressive. The accuracy that you get and the repeatability, of course, with robot is very, very good. So this is very accessible technology. And we have now

34:32

something like 20 of these cells for various customers mostly in universities, DOD research, and actually some production companies. Yeah, I would love to have something like that. I have the space for it. It's not even that big. yeah, just again, the money. mean, 200K is nothing for big company that you're getting bang for your buck. just whether or not we could pull that together here at the school. But it's definitely on my dream. oh

34:58

Hmm.

35:01

Right.

35:07

the nuances, All right, sorry, Nathan, go on.

35:26

Yep.

35:28

Yep.

35:32

I will move on to, so we talked about equipment and I agree with all the suggestions. As far as software, Jim you talked about Robot Studio. Is there any other software that any of three of you can think of that would be useful in my classroom that we're not currently using? We have Fusion 360, we have SolidWorks, we have CAM software, but we don't have Robot Studios, we don't have any sort of welding software. Any ideas?

36:16

Gotcha.

36:23

You know what, I'm having a senior moment, I'm drawing a blank completely on the name of the slicer, I'm just gonna give you... Anyway, I can look it up. Sure, you can always email me later, that's fine.

36:46

Yeah, no, I'll probably be installing it after this meeting.

36:56

sure thing. That'd be great.

37:00

guys have any other questions about robots and...

37:05

That's all right. It's a big thing to bring to the table.

37:24

Well spring is... It's not here, it snowed yesterday. Spring in Vermont is like the end of May.

37:35

Let's see here.

37:41

Let's get.

37:52

We were just up in Colchester. ah I took the students on a field trip to the military. They have like a museum and a base there. It's pretty good.

38:02

Yep.

38:16

Yep.

38:21

Just gonna ask that.

38:31

You don't have to leave. No, no. always...

38:38

Yep. Yeah. Like Jim was saying, there is a lot of aerospace stuff going on in Vermont that I think a lot of students are completely unaware of them. Like there are lots of opportunities here for defense contractors, et cetera.

38:54

Mmm.

39:04

Cool, very cool.

39:10

that I do.

39:12

So either thermal spray or cold spray and even make cladding, know, just using the robot to clad parts that then get machined and put into things like nuclear pumps. Huh, I've not even considered that. Yeah.

39:37

Mm hmm.

39:43

know, know who they are.

39:55

that's really starting to evolve more and more, I'm interested to see what you have for sure. Yeah, mean, you know, one of the technologies that we've developed with a company in Connecticut, the company is called Scalable Robotics, and they've developed an application using 3D scanners where to clad or to do a repair for a part, you can actually physically scan the surface of the part.

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It will then create a path for the robot to fly over that part and clad the part. You know it's amazing. That's like magic. That's crazy.

40:42

Hmm.

40:46

Well, yeah, where are we at? Oh, 40 minutes in. I don't have any other questions for unless there's anything you want to bring up. You've introduced me to new technologies, new products, everything that the exact reason why we have this meeting. So I very much appreciate it.

41:18

Yes.

41:40

Mm-hmm.

41:45

Yep.

41:49

That's fair. Yeah, that makes sense.

41:55

Cool. All right. Well, unless anyone has any closing remarks, uh thank you for your time. Please reach out to me with any emails for anything that we mentioned tonight, if there's

anything you think that would be helpful as far as links are concerned. It sounds like you guys will be talking to each other more than I will be talking with you.

42:23

ah There is a chat function. Let me boot it up. uh Testing. This should pop up on the right side. You'll see a little like, um looks like almost like a flag. It's like a speech bubble.

42:35

There we go.

42:46

No, we didn't. Feel free.

43:27

Mmm.

43:38

Yeah, I didn't need we have nothing in my class in this entire school that involves scanning. So I think that would be really useful for the students to have experience with. I just put that on my shortlist. Yep.

44:33

that NDT? Yep.

44:59

Wow.

45:10

Yeah, I wonder how many schools even touch that, right? That's something that I don't think I've ever heard brought up in any of my previous um advisor meetings. So just welding inspection in general, like ultrasonic. ah Do they use any other technologies? uh Do they use x-ray or probably not? assuming that everything would just be metal. That wouldn't work. Never mind. It would just be like ultrasonic then, right?

45:40

Oh really? Okay.

45:59

Hmm. Okay. I guess that makes sense. I'm thinking of x-rays. You'll have a human survive You probably have a whole different energy level when you're talking about a machine uh

46:11

don't think so. ah Nathan just, the phone call just dropped. I noticed, I don't know, he was breaking up and then it's gone. He'll either call us back or, I don't know. Though, I don't know, I

think he was talking about scanning, quality control, vision systems, man, I got a lot of stuff from this. Thank you guys. Yeah.

46:38

Unless Nathan gets back on the call with us any anything else you want to bring up?

46:54

Yeah, that would be fun. That'd be great. Yeah

47:03

Right. You know, when schools call me up and say, have \$5,000, what can I do? Well, nothing. That's tough.

47:18

Yep, cool, cool. All right, well thank you guys, thank you Rick, thank you Jim so much for being on this call, this was very productive. Yeah, nice meeting you. Yeah, and I hope if, I'll invite you guys to the next one, it'll be next year. But yeah, excellent, thank you, thank you so much and have a good one. Thank

47:40

Same, you too.