00:04
Speaker 1
Hi, this is Jaco.

00:04
Speaker 2
Michael, this is Lenny. And you're tuned into the Human Machine podcast.

00:11
Speaker 1
How are you, Lenny?

00:12
Speaker 2
I'm good, Jaco. That's the first podcast we're doing for the new year.

00:15
Speaker 1
I know it's Friday and it's February already.

00:17
Speaker 2
It is. We were slacking a bit, so hopefully we're kicking this off with a range of topics that we're going to discuss this year. Unfortunately, I would have loved Covid to be over and that it shouldn't be even in state of mind. But unfortunately, it seems it's still going to be with us for a little while. But that's okay.

00:37
Speaker 1
Yeah, in many ways it feels like 2021. It feels like we had a couple of days of eating too much, but in many ways it still feels like 2020. But yeah, there definitely is starting off this year definitely is a renewed sense of optimism with, or a sentiment of optimism when you speak to just different people. We received the first batch of vaccines. I think we're definitely going to see a little bit of recovery in many ways, in many sectors, in many industries. So we looking forward to a bullish year and hopefully we can see some of that turned around or some of the damage that's been done last year turned around that's been so devastating for many people. Right. So we've got an exciting couple of podcasts and features coming up. We're going to delve into a series of the future of.

01:32
Speaker 1
We're beginning to have just different conversations of people in the brewing food and beverage. I think we're going to do water and waste water. I'm just going to say water again. There isn't no such thing as waste water. It's just water that's been wasted. And the idea with the future of Israel is to get a sense from people in the known, on the floor, on the ground in those industries, just to get a sense of how much has changed and what they look forward to in the future in terms of technology and efficiencies, making things better. We also, starting today, we also want to kick off the year as we typically do, although it's already February.

02:14
Speaker 1
We want to kick off the year with just a bit of a view of trends, maybe the impact of COVID again last year in the way of work and how we work as teams and how we implement solutions and technologies has changed. But just get a sense of what we can expect from different areas of manufacturing, some of the trends that we can expect for all, for this year and obviously going forward.

02:41
Speaker 2
And I think the topic that we've got today actually falls into some of the series that we ended off last year. We had conversations with Walker around machine learning and the unified architecture. And one of the outcomes of that series was that OEE is still the metric of choice that you should definitely be implementing and have in your manufacturing environments. I think we couldn't think of anyone better to have this conversation with than obviously, Gerhard Greef.

03:10
Speaker 1
Yeah, absolutely. Thank you. So we, today we're chatting with Gerhard Greef. I'm sure that our listeners here in South Africa, many of you have know Gerhard well, have met him before, at least heard of him. Kharat's a bit of. A. Bit of a legend, I think, in the mes world of space in South Africa. So Kharat is the divisional manager, PM and C at Iritron. He is also the vice chairman of the board for Mesa Africa and also a Mesa board member at large for Middle east and Africa. So, hara, welcome to the Human Issue podcast. It's fantastic to be chatting with you and look forward to the conversation.

03:54
Speaker 3
Thank you very much for that great introduction. Know, my. My headset almost broke from my head swelling that much. You know, you guys really know how to talk one up, right?

04:07
Speaker 1
No, it's facts. It's facts. I think we certainly, for myself and a lot of other people, you know, if we're looking for an opinion or a view or guidance, I think you are very often the first name to pop up when it comes to anything. Nes.

04:21
Speaker 3
Thank you very much. Nes.

04:23
Speaker 2
Just.

04:24
Speaker 1
We're probably going to have a lot of three letter acronyms over the next couple of minutes. We're going to try not to do that. So Mes is obviously for, if you're not that familiar with different disciplines, there's obviously manufacturing execution systems. And, yeah, we really want to chat with fellow today and just get his overview of, oh, I mean, there's so many buzzwords next gen mes and digital twin, and really just get a lay of the land and Kharat can maybe just canvas for us what that area of industry looks like at the moment and how important mes still is or is for industry 4.0. But before we do that, I don't know this. I mean, I know you and I've known you for a long time, but how did you get into this?

05:12
Speaker 1
What we believe is one of the sexiest industries that we have. But how did you enter the industry? Where did your journey in this world start?

05:22
Speaker 3
Jaco? Yes, I started off as an engineer working at then nucor, which is today in Nexa during my studies. And I got a bursary from them and then as soon as, well, then they started with the layoffs or downsizing. Right. Sizing, whatever you want to call it. And I then, and they said, well, you know, if you find another job, it was voluntary, so if you find another job, you don't need to pay back your student loan. So I said, well, that sounds good to me. And I left, joined a pharmaceutical company, worked in a fine chemicals plant making active ingredient aspirin and paracetamol, et cetera.

06:19
Speaker 1
And this is formal, this wasn't backyard fine chemicals.

06:23
Speaker 3

No, no, that, yeah, it was yards. Well, you know, funny story. We actually, we actually did get a bloke that came in looking for a specific compound and we researched it, we made it, and then we got raided by the police.

06:47
Speaker 1
Name was.

06:49
Speaker 3
No, no. Well, it was actually one, it was one derivative away from Mandrax. Wow. We didn't see the connection, but I mean, the guy bought tons of the stuff and were making money out of a first because, you know, were making it for like $1, selling it for ten. And, but the actual value of the purified substance was actually 1000. You can, so we thought were making a lot of money.

07:28
Speaker 1
I'm amazed that Lenny didn't ask you where you studied. You know, that's usually Lenny's first points of interest when it comes to the background and studying.

07:39
Speaker 3
Yeah, I studied at Wald University, technology.

07:43
Speaker 1
Okay.

07:43
Speaker 3
So yeah, they were the only university or the only technicon at the time, giving chemical engineering discipline.

07:56
Speaker 2
Wow, that's interesting. Normally, if it's not text, it's text of next.

08:01
Speaker 3
Yeah, I would have loved, but, you know, I got a bursary to go to the technicon, so I took that. Yeah. So I started off in a chemical plant, opening and closing valves. Took me about a year to kind of learn the insides and the outsides of the plant. Then I trained somebody up to do my job. Then I sat around for about three months twilling my thumbs reading books. Then I went to my boss and said, listen, I'm bored. I need something. I need a challenge. And I did that another two, three times in the same company. Stayed there for ten years, left to do environmental consulting. So I finally ended up as the total quality and environmental management manager for the pharmaceutical facility. And then I went and did consulting on my own for about a year after that. I.

09:11
Speaker 3
The problem with that was, you know, I was. I was a. About a decade too early. Yeah. You know, because you know, the environmental or the greenies are only coming to rights now.

09:27
Speaker 1
Absolutely. Yeah.

09:29
Speaker 3
But, you know, 20 years ago, they only started talking. It was something that happened in the US, not in South Africa. So that's why I then went and joined a company called Proud Food Consulting, similar to McKinsey, and stayed there for 18. For about 18 months, worked in the US as well as in South Africa. And I then decided, well, you know, where is the best place to be? And that's in automation. Because I know, you know, if you're a plant

manager, what it feels like to get a call 01:00 in the morning and tell you that there's no. To tell you that there's no milk, and to guide people through the process of fault finding, pneumatic systems and relay logic systems, etcetera, over the phone.

10:27
Speaker 3
So automation sounded like a great place to be and, yeah, that's kind of how I joined in the mas kind of environment, automation mas, and I've been there for 20 years now.

10:51
Speaker 1
Yeah. Pretty much directly from your studies trading to a very specialized manufacturing world and environment.

11:00
Speaker 3
Yeah, yeah. So, you know, I love manufacturing. So the problem that, and the reason why I kind of left the students I could from Nexar was they're a research facility and, you know, with any experimental process, you have to repeat the same thing seven times to get, you know, valid. A valid. A valid result.

11:27
Speaker 1
Yeah.

11:28
Speaker 3
And making the same mistake seven times just didn't work for me. You know, then you change one little thing and then you make the same mistake again seven times, and then you change another little thing until ultimately, or finally something works. So, yeah, I decided that's not for me. I'm going to go into production where I can actually see stuff happening. And I love manufacturing, from mining right through to pharmaceuticals.

12:00
Speaker 1
Yeah, no, for sure. That's how we know you. We know you as a. As somebody with love for the industry and the technology and a passion for it. And it definitely shows in all the good work that you and me so have been doing and making sure that awareness and that education gets out. And I think that's a quite an important piece because you would probably know more than anybody that, you know, in our world, there's a lot of misconceptions and a lot of, you know, in certain cases, even poor experiences with a. With what has been labelled mes, whether it's expectations. Or. And you mention mas to certain people, and the immediate thing that comes to mind is something that is out of the box, but heavily customized with a massive price tag that's rolled out over nine years.

12:54
Speaker 1
Not quite nine years, but that's very often the perception that a few people have, and you're probably closer than anybody to understand why that is.

13:04
Speaker 3
Well, yeah, and, you know, the problem with that is the people with a little knowledge and a little experience, they have that view. And the reason that they have that view is because when they started on the journey, they had a one project view. So they said, well, if the project is finished, we have mes. So if we implement OE, we have Mas, and they don't basically look at the bigger picture, what am I actually trying to achieve in my factory? What do I need to achieve that right. And then do a whole process of small projects. It will still probably take nine years, but if, you know, you're in for nine years stint or three year stint, it doesn't come as a surprise.

14:07
Speaker 3
Where if you think it's a six month project that turns into a one year project and then you still don't have everything you want, that comes as a surprise.

14:20
Speaker 1
Yeah, yeah.

14:21
Speaker 3
And that's kind of one of the. One of the things we. We try to educate via me, so that, you know, whatever you do in your factory needs to make or needs to be a part of a long term integrated solution vision.

14:41
Speaker 1
Yeah, yeah.

14:43
Speaker 3
You have to have a strategy to actually do that. Otherwise, you kind of will end up like a lot of companies with silos of speciality information and a integration nightmare.

14:58
Speaker 1
Yeah, for sure.

15:00
Speaker 3
That's why there's a lot of people. And, you know, that's why Walker talks a lot about the unified architecture, is because legacy gives us those silos of information, and the one train of thought is, well, replace it all by one suite of products that's already tightly integrated, which is one way to do it. Right. But that's a rip and replace exercise, and that comes at a huge cost. Or the other train of thought is, well, let's go and implement the unified architecture and just connect all these things to the unified architecture so they can communicate with each other easily.

15:54
Speaker 1
Yeah, yeah.

15:56
Speaker 2
I mean, Gerhard, I remember that from. From the mes course I did with you is 100%. Is you just don't simply go and rip out an mes suite and replace it with something else. And to your point, normally what we see as well is, yes, after the nine years, then some guy comes and looks at what the implementation is, and they said, I spent so much money on the software suite and I'm only using the smallest little portion of what that suite is available to actually implement. And I think that's a big misconception that people have, is it's almost this massive hammer for the small mail that you need to whack into the wall kind of scenario.

16:34
Speaker 2
And it's to your point, it's because we spread so long to prove one little piece of value and after the nine years, oh goodness, we only have a very small little piece of to show for that actual capability of the entire software suite.

16:49
Speaker 3
Yeah. Correct. And in a lot of cases, because it's not integrated, so it doesn't come into its own as a total solution.

17:00
Speaker 2
Correct. Gareth, one thing that I remember way back when is it's almost, it feels to me that mes suites and software or, you know, these, there's these kind of cycles that it goes through. One day you need a solution that's

heavy, customizable, then there's a new buzzword about, no, the mes solution must a little bit more configurable rather than coding. So it must be out of the box, just tick a few things and it needs to give you the functionality. And it almost feels to me that we back with the little bit more kind of customizable approach. Obviously, open source software and database technology and stuff that's also freely available, has that kind of mentality from I can customize my mes solution just like I want.

17:48
Speaker 2
Why is it that it seems that MAs is trying to become this configurable thing, but then when you try to apply it to a certain industry or a certain scenario, then it's almost like, oh no, this is not going to work. We have to customize this whole thing. Is it just an understanding and an education process or what? Have you seen the ratio between out of the box just ticker thing versus this whole massive behemoth, you know, customization effort that normally people have in their mind when they talk about an immune.

18:19
Speaker 1
Yeah, and together with that is obviously. Sorry to interrupt you. Then together with it is obviously also a whole team of people that has to support from all over the world. And I mean, that does seem less than ideal for something that is agile, flexible, you know, easy to do, and maybe that's what scared people off.

18:40
Speaker 3
Well, you're right. But I think to Lenny's point, what I've seen is that where you have to do a lot of customization is when you pick a product that's not necessarily built for a specific industry sector or niche industry. You know, it's like, can you run your company finances using a SCADA system? Well, yes, with a lot of customization, you can do that. Right. But is it the right tool? Well, probably not. Right. You rather go for, you know, some ERP type of solution for that, then a SCADA system and the other way around, you know, can you use the ERP system to run your plant? Yeah, with a lot of customization, you can do that. The problem that I've seen, and I still come across that quite frequently is where people actually do that.

20:04
Speaker 3
They take that, they take the ERP system, they customize it to run the plant, and then they're locked in forever.

20:14
Speaker 1
Yeah.

20:15
Speaker 3
Because they cannot, you know, even though, I mean, I talked to a client the other day, the ERP system and Mes system is integrated. It was, it was developed 30 years ago and in a language I've never actually heard of before. So, you know, it's that old. So, you know, you can do that, but it's not necessarily the right thing to do. So will there be customization? Yes. What is the extent of the customization? It depends on how suited the package that you selected is to the business requirement.

20:58
Speaker 1
Yeah. So it's fit for purpose and best, but 100% you have.

21:04
Speaker 3
To, you have to go fit for purpose.

21:06
Speaker 1
Yeah, yeah, no, definitely.

21:08

Speaker 3
You know, and like I say, and, you know, always remember, it's fit for purpose for the long term strategy.

21:16
Speaker 1
Yeah.

21:16
Speaker 3
Not fit for purpose for the current project.

21:20
Speaker 1
Yeah.

21:20
Speaker 3
And, you know, we see people make that mistake often. We, they choose something to do oe and then, because that's the current need. But they didn't look wider. So they did not look at scheduling. They did not look at material tracking. They did not look at warehouse and stock takes. You know, they did not look at the rest of the production requirements. So when they then want to do the next project, then either they have to go and buy a different product suite or they have to say, well, how are we going to customize our oe solution to do these things as well? And that's where you get massive customizations. Yeah.

22:10
Speaker 1
These people that you speaking, I mean, you obviously interact with a lot of people and a lot of customers, and you've got a very good sense of the needs and the challenges that these people are facing. When we talk about these people, I mean, after all it is, these people are the ones with a vision that drive the project, that own it, that have either the skills or the experience to understand what is required and make it successful. How do you find that currently from a south African context? We are all very familiar with just a number of people and engineers that have. That have departed and have left South Africa, specifically relocated. Do you think that is currently having an impact in terms of how those things are perceived and how the value is attached?

23:05
Speaker 3
Yes. So one of, we've got two in my mind, we've got two big and major issues in South Africa. The one is kind of the aging workforce. Right? So the baby boomers, they retiring and they have not managed to transfer their knowledge and experience into a system so that the next people can actually take over and continue. Right. So a lot of that information because, you know, they used to paper is either in paper in their heads, so we're losing those skills. And the only way to basically entrap that before it's lost forever is to systemize it in a some way or the other.

24:04
Speaker 1
So you tested knowledge that you know in your head, you're not necessarily ever going to write it down or share it unless you asked or forced to do it. Yeah.

24:13
Speaker 3
Correct. You know, and let's face it, if you are the training or if you're training your replacement, you can do the best job that you can ever do, but you'll only transfer about 60% of what you actually know. Because if something doesn't happen, something doesn't come up while you're training the person, you're not going to train him how to react to that adverse event. And that's one of the things that we often forget is we train people in. This is the process, but we don't train them in. But what happens if there's something that's out of the ordinary? What if there's an adverse event that happens? How do we react? Because if we keep on following the process, we may blow up a plant or kill somebody. Right. So what do we do?

25:14
Speaker 3

And that's why people have safety drills and evacuation drills, etcetera, in companies, because if there's a fire, you have to train people what to do. So you do that on a frequent basis and then people know, well, if that adverse event occurs, this is how I need to react. We don't do that for our production processes. We don't train people what to do when things go wrong. We only train them what to do when things go right. And that's what I'm talking about, you know, when we're talking about the aging workforce is we're losing those skills, those tribal knowledge that sits in people's heads. So that's one problem, that's more a global problem. But South Africa has the same problem. And then associated with that is we also have the situation where our culture over the years have changed.

26:18
Speaker 3
Historically, people stayed in a job for 40 years.

26:22
Speaker 1
Yeah, yeah.

26:23
Speaker 3
And they practiced the same job, and they became specialists in that job over a 2030 year period. These days, people, you know, young people come out of university, they want to become a manager within two years. Right. And they expect to perform as well as somebody that's been in that job for 20 years. So the kind of instant gratification culture that we currently experience throughout the world is, as a result, well, results in people not having the ability to do the job in the most efficient manner because they don't have the experience. So if we don't automate some of that, then there's a problem. Now, in South Africa, we've got to Lenny's point, the issue where we have skilled employees leaving the country, that so we getting. So there's a scarcity of people that actually knows what's going on.

27:40
Speaker 3
Now, they may not necessarily be kind of a baby boomer, but they've got certain skills. And what people are doing about that is they're saying, well, you know, we used to have a boiler specialist and a turbine specialist and a water purification specialist on each one of our sites, but we don't have that anymore. We can't afford to have three specialists one site. So we are going to build a centralized control room or a monitoring centre. You know, people call it different things. So it's either a central control room or a central monitoring and diagnostic canter. And they bring. Yeah, well, it is fancy names. Yeah. So they bring people together, so they only need, you know, say, one specialist.

28:39
Speaker 3
So instead of having you have ten different sites, each with a boiler, you only need one boiler specialist centrally to diagnose what's going on in each of the ten plants, and then talking to the operator and saying, you know, do you know that your boiler is showing this behaviour? The way to rectify that is by doing XYZ. So people are doing that, and some of the bigger companies are actually doing that. Getting people together in a central place where they can actually manage a fleet instead of a plot.

29:25
Speaker 1
Absolutely. I love that idea. And one of the podcast episodes of beer whiskey coming up is with a global beer brewing manufacturer and they've done exactly that. And the whole concept is that the entire team that everybody that's relevant in either decision making or learning or overall outcome all sit together. And it's a fascinating new way of looking at it. And probably difficult for a lot of people, difficult to get used to that kind of environment where everybody share the same space to solve problems together, to learn together. But that is definitely seems like. Definitely seems like the way of the future.

30:11
Speaker 3
Yeah, and there's a lot of companies actually doing that. So I'm aware of the company you're talking about, but there's others as well. So it's one of those things that's starting to come online faster than it used to. So everybody wanted, you know, kind of controlling its own area. So, you know, we started off with, we've got a

set of boiler controls and we've got a SCADA system or a DC system to control our boiler. And then we've got another system to control our evaporation circuit and we've got a different control system for our digester. But people. Well, then people said, well, actually this doesn't work because they don't inter communicate and we have to rely on the. On the, on the operators. So let's make a central control room for the plant.

31:15
Speaker 3
We're now taking that one step further and we're saying, let's make a central control room for our fleet of products or a fleet of plants and not for a plant. So I think it is an evolution of learning and seeing that we cannot get the best efficiency out of our plants. If we have to have a lot of specialists in each one of our plants in South Africa, it's doubly a problem because we do. We are losing specialists at an alarming rate.

31:58
Speaker 2
Luckily for us though, I think something that helps us tremendously with this is that I think technology also actually caught up a little bit. Well, yes, I remember when I did the trial, I'm reverting back to the Misa training that I did. You know, that whole concept that you speak about creating this unified architecture, so you kind of, in the training you reverted to, you just wrap, you wrap your solution into something that creates, like a service bus architecture for unified architecture. You don't need to rip and replace and completely overall it, you just need to wrap it to a form, to that standards. And I do believe that open standards are. Luckily for us, open standards is now a little bit more adopted. There's a lot of technologies that support OPC, UA.

32:47
Speaker 2
There's a lot of technologies that support normal SQL query language to get data out of their solutions. There's a lot of technologies that's starting to adopt MQTT as an open standard. There's correct. Cloud hosting solutions is actually becoming affordable and people are not afraid of it anymore. That is this thing sitting in the cloud, pushing data to it, and, you know, it's gone. So I think that luckily for us, as South Africans, yes, we've got a massive brain drain, but luckily for us, technology caught up that we can actually relatively easier and quickly start implementing these rocks or central operation centres that we've got correct.

33:25
Speaker 3
And I can tell you if technology wasn't as kind of caught up as it is, this pandemic would have had a much worse effect on everybody.

33:39
Speaker 1
Absolutely. It's especially during this time where so many of those things are, we're just super critical.

33:46
Speaker 3
Very correct. You know, and if we look at prior to Covid, I think, you know, I probably had in total, I don't want to lie, but, you know, I think ten team Zoom, Google hangout meetings in my life.

34:10
Speaker 1
Yes.

34:11
Speaker 3
And when Covid hit, it was like ten meetings a day, and I think it was, and I don't believe that is ever going to go away because it is a lot more efficient to have a meeting where you don't have to get in a car, drive for an hour, have a meeting with somebody for half an hour, and then drive an hour back. Right. You can actually have a meeting. You can sit in your office, log on two minutes before the time, have your half an hour meeting, and you're back in your office immediately. So I don't think that is going to go away. That's probably yet to stay.

34:58
Speaker 1
And in the mas world or in the execution world of manufacturing, we looking at Covid and the ability for, let's

say, for example, a beverage manufacturer, the ability to very quickly change lines, recipes, change output. I'm not sure how much of COVID has disrupted the way that some of these companies do business, given changes from market demands, people wanting to stock up as an example, because they're worried about a two day lockdown and that increase in demand, the ability to not have your entire team be at the manufacturing site and being present and working, but maybe having to do that remotely. Do you think that most of these organizations and systems in place were able to easily adapt and change, force change? Or do you think some of them struggled with what they had in place?

36:09
Speaker 3
I believe most people struggled, and that's one of the reasons why we've seen a shortage of certain products or raw materials. And you know, if you, I just read an interesting study by PwC and they saying that this, the COVID has basically changed the way that people think about the supply chains. So they used they used to say, well, let's go global, right? And what they're saying now is, well, we have to go global, right? So it's from globalization to globalization. So we in sourcing a lot of the stuff. We are automating a lot of the things. So, you know, why did us manufacture go to China? Because it's cheaper to produce in China. What they're doing now is they're automating a lot of those human processes that humans used to do.

37:33
Speaker 3
So they're taking the human out of the equation and that now makes it affordable to still manufacture within the US. And we see the same thing in, you know, Germany and Europe, etcetera. So it's going from, we used to think that, you know, if we outsource a lot of stuff to other countries, it's going to be cheaper. Now they're saying, well, let's automate and bring it back. Because if I actually make it in China and I sell it in the US, right, my supply chain planning needs to be on point. If something happens, you know, it's a long lead time. So it's a twelve week lead time or a three month lead time to get it from day to year.

38:27
Speaker 3
So if I bring it back, if I insource it, if I bring it back in country, then I can be more agile, I can respond faster. And so we've seen a global trend moving in the direction of bringing manufacturing closer to the market. Again.

38:52
Speaker 2
Nothing like a pandemic to poke a few holes in your supply chain.

38:57
Speaker 3
You know, if you look at, you know, in South Africa, we've got a major issue with steel at the moment. There's a shortage of steel. Not that I know what they actually do with steel these days because, you know, there's no buildings going up anymore, but you know, there's a shortage of steel. Steel comes at a big, big cost at the moment, right? So some of the kind of third tier suppliers are struggling to make ends meet because not only is their markets depleted or their markets have gone away as a result of the pandemic, but also there's a shortage of raw material, so they have to pay more to get the raw material so their profit margins shrink and then the demand is also down. So there's a lot of them that's in trouble.

39:49
Speaker 1
Yeah.

39:49
Speaker 2
Now, interesting. It also. Exactly to this point, it also forces. Well, I've read a few articles about it that forced companies out of their traditional comfort zone. I read an article about a car manufacturing company that supplied the panels to the automakers. And what they've done is they realized that they actually, nothing in making panels business. They're actually in making steel business. So they actually bought out old steel mills in country to supply them directly with material. So taking your normal business operations, look at your supply chain, and then also identify potential opportunity to actually do that, to say, well, let's just make our own steel supply just to us. So should make us tighter.

40:44
Speaker 1
Yeah.

40:44
Speaker 2
So that's a positive thing that actually can. That can come out of something like a 90%, to your point, bringing manufacturing back. I mean, if I drive. If I drive from the airport to Pretoria, my goodness, the amount of warehouses.

40:56
Speaker 1
On that road, it's.

40:57
Speaker 2
It's actually scary.

40:59
Speaker 3
Yes. Now it is, yeah. And there's. There's manufacturing there, but actually very little from a ratio perspective to just plain warehousing.

41:12
Speaker 1
Correct? Yeah.

41:14
Speaker 3
Cool.

41:14
Speaker 1
So we spoke a little bit about the challenges. I want to chat a little bit more about the market dynamics. What do we call it? I want to call it trends and insights. That's so generic. Let's call it some of the opportunities, maybe, that you see for manufacturers right now, given the technologies that are available, given the advances in IoT and comms, what are some of the opportunities that you can see? And maybe, if you don't mind expanding a little bit around the opportunity for mes in something like power generation or water and wastewater, where very often food and beverage was said to be a very specific application and a specific type of manufacturing. But there are a lot of instances where it could be very beneficial to other parts of manufacturing and industry involved.

42:09
Speaker 1
So, yeah, if you can maybe give us an idea of some of the opportunities available in the mes space at the moment.

42:15
Speaker 3
Well, there's a lot of things that you can do, and each different industry's got specific requirements. So, you know, from my time in the pharmaceutical industry, I know, you know, hazard analysis, critical control points is a major thing that is part of good manufacturing practices. You know, ensuring that there's a hygiene check between changeovers of product. Right. So that you don't get contamination, etc. Etc. There's a whole lab process, all of that. But that is a kind of something that's done in the regulated industries where you can actually affect people's health. So pharmaceutical and food and Bev cleaning process is another one. But if you move to other types of manufacturing, other things basically become important. Like Kanban, right? Like work in progress tracking, like finite capacity scheduling, like real time tracking stock take.

43:39

Speaker 3
You know, automating the stock taking process, or reducing the time it takes you to do stock takes. That's more a general thing. That is for general type of manufacturing. If you go to metals and mining, you've got survey analysis, your valuation analysis, your recovery calculations, your mass balancing and recovery tracking over your different plants. So depending on what type of industry, there's always a slight variation in terms of what they need. One of the things that is almost always a requirement is the need to capture and visualize real time data. There's always a need to capture downtime and the reasons for the downtime. There's always a need for root cause analysis, whether it be a process problem, or equipment problem, or a person problem. But, you know, a way to find out after the fact why something happened.

45:11
Speaker 3
One of the things that's recently kind of starting to become more prevalent and people are starting to look for solutions is to go from reporting what happened. So that's where we all started with the morning report. What happened yesterday, when we talk about, you know, the brewing companies central control room, etc. Etc, is what is happening now, so we can make the appropriate decisions. The next step is where we actually start getting predictive, where we can actually say, based on some statistical process, control, based on machine learning, there's a high likelihood that this process are going to ex, going to deviate from its quality requirements in half an hour. So take some, take a corrective action now to prevent that from happening. So we're starting to prevent things now.

46:28
Speaker 3
And that is something that is possible with most manufacturing industries, whether it be mining, general manufacturing, food and beer, pharmaceutical. As long as you have data available and you have real time data available to you can start implementing machine learning type of applications. You can start doing smart stuff with the data that gives you the predictions. So you can start detecting anomalies, you can start detecting things that the human mind would not necessarily correlate to tell you something is going wrong. So that is, I believe, something that is going to be more and more in the foreground in the years, the next few years to come. Sorry. Most companies have gone from reporting to what's happening now. And they saying, well, the next step is to do the predictive stuff, to do the data science stuff, to predict what is going to happen.

47:49
Speaker 3
So, and we also have to think of it in this way. So if we talking about a specific piece of equipment we can identify using machine learning tools and advanced pattern recognition and AI, we can kind of identify when it's going to break, right? Based on, you know, the patterns and the algorithms and things. So that is one. But that is only looking at a piece of equipment within a bigger plant. If we can also start drawing together that piece of equipment, you know, is not doing what it should be doing. And if we extrapolate that, it means that in 2 hours time, the machine right at the end of the line is going to have quality problems. Right. Now, a good example of that is I'm not sure if you guys have heard about data point clouds.

48:57
Speaker 2
You can enlighten that.

49:00
Speaker 1
I'm not going to put down any money on that, but no.

49:03
Speaker 3
So basically what that is when you, in the, when you're measuring dimensions. So for instance, in the automotive industry, okay, so when you're measuring dimensions, because remember you build a chassis and then the body needs to fit on the chassis and they've got reasonably strict kind of measurements to make sure that everything fits together, then the door needs to fit onto the body, right? But if the door is a little bit too big, then the door doesn't close properly. If the door is a little bit too small, right, then you get a gap and, you know, you guys probably read the stories about Tesla's cars that, you know. All right, so basically what, what the concept around it is, you take the door and there's a number of measurement points on the inside of the door and on the outside of the door, right?

50:14
Speaker 3
And you basically build a kind of three dimensional model of the door using those points. So, and then you compare it against the digital twin, right? What should it be? And then you get the deviation. So that's number one. So does it, is it within spec? Right? So you know, a difference of, you know, 50 microns or whatever could be acceptable or maybe 2 mm, whatever the case may be, right? So there's a specification. So it needs to be bigger than this and smaller than this. Okay, now that's step one. So now you build that 3d model. And because it's only points, it's a cloud. But on a 3d model, you can actually see what the points and you can basically twist it and whatever. So that's a data point cloud.

51:19
Speaker 3
So it's a cloud of points showing, say for instance, a door in a 3d model. So this is the standard. This is the door. If you then take that further and you say, okay, but this door, let's take a hypothetical situation. This door on the bottom is 2 mm bigger than it should be. Then you take that one and you look for a body where the space the door needs to fit in, right. Is 2 mm too big, right. And then you match those two parts because then it's going to be a, a better fit than trying to fit a small door in a big door space. Or a big door in a small door space.

52:18
Speaker 1
Sounds like you have a baby.

52:22
Speaker 2
Sounds like I need a hammer.

52:25
Speaker 3
Well, yeah, well, you know, so obviously Tesla didn't implement that yet. But you know, it's things like that where people are saying, what can technology do for me? So I used to be, I used to have this drawn out on a piece of paper, and as long as it fits right, or as long as it's inspect all the points, it's a go. Now they say well, let's put it in a data point cloud, let's look at it, see where the deviations are, and then see if we can match that deviation with a different part that also has a similar but opposite deviation so that they actually a perfect fit.

53:09
Speaker 2
Gerhard. And obviously very important to that is obviously you still need the metric at the end to compare it against, right. So I think a lot of people also think that, geez, if I go this machine learning route then all of my traditional KPI's and I'm going to take Oee as an example, you know, necessarily then why do I need this Oee? But it's still very relevant because you still need to compare back to that KPI to say, hey, is this thing actually working or not? And it's a typical crawl before you walk kind of scenario. And there's very merit still in the normal KPI's and metrics that we need to get in place before we can go to these very high tech kind of solutions. But the tech is available. It's there for us to utilize.

53:54
Speaker 3
Yeah, the tech is there.

53:57
Speaker 1
Speaking about the tech, sorry Kylo, speaking about the tech, it feels like we can't have an episode without bringing up the usual buzzwords. So this journey towards digitalization in the world of all the proliferation of IoT, how are some of these systems that were really essentially designed, sort of call it pre IoT? How has that changed the outlook or the way is it still relevant? Did they have to make a U turn in many cases or adoption, you look at, for example, and I have to mention it by name, Sepasoft. That's built on top of ignition, for example, as a platform. So the question is really, how have these mes systems, is it a concern?

54:49
Speaker 1

Has it changed a lot in a world where these systems were very often designed pre IoT and now we get all this benefit of just the availability and access to data, as one example, with IoT, how has that changed nes in the way that it is? These systems are designed and integrated with the rest of business?

55:14
Speaker 3
Well, that's a, I think it's a bit unfair to ask me that. You know, I'm not a vendor of software, but, or a producer of software, so I'm just a user. So, but what I've seen is that a lot of companies, I think Lenny talked about the monolithic mes, right? So a lot of companies are these big tech monoliths that is like a tanker that takes 20 make a turn, right? So the technology, the MAS technology and the way that MAS technology providers approach the situation is not bye changing the inherent technology. What they have done, however, is to open it up more so that you can get alternative sources of information in that it can accommodate alternative protocols like MQTT coming from the IoT environment.

56:35
Speaker 3
So they've adopted kind of the peripherals around the technology so that you can get more information into it. Remember, if you talk to any technology company or any technology provider, people that actually make software, they want to make software that they can sell. And I mean, the case in point is back in the day with DC's. DC's vendors were the last to adopt OPC because they did not want to open it up until the market forced them.

57:18
Speaker 1
Yeah, that's a great example.

57:19
Speaker 3
Open it up. All right. So they didn't want to go the OPC route because, you know, and they had, it's a safety concern and it's integrity concern, etc. Etcetera. But the market forced them. Now the same thing is happening with masked mas vendors or they saying, well, people are going to start connecting stuff in here and if we don't make the necessary tools available for them to easily integrate, they may go outside and look for something else. But have they changed architecture in a major way? No, not a lot that I could see. Right. And then you have your new kind of entrance into the market, into the traditional mas market. And those are your Iot type of providers and they come from a Iot world and they're building tool. They're building Iot tools that can do mes functions.

58:35
Speaker 3
But traditional mes guys, they not going to be changing very soon if you ask me. Right. Except by making, opening up, allowing more protocols, making it easier to integrate and into a unified architecture. Yeah, and a lot of them still, and it's unfortunate, but a lot of them still want to be the unified architecture where in fact they are not correct.

59:08
Speaker 2
And, and I think it's one of the questions that people ask Walker, again, just going back to that about what software is this thing? And sometimes there's no right answer for that. Unfortunately, at this point it might be, yeah, sorry, we're running almost at an hour, but I really want to just touch one more little technical thing and I think Jaco’s got a few things to ask about Iritron, I just want to, I know you said do your homework before you choose OEE or Mes application, fit for purpose, fit for industry. I just very quickly want to also talk about. There's also a thing where you need to choose your metrics to industry. Now we all know OeE.

59:52
Speaker 2
We all know, you know, the kind of, it's all about utilization of the equipment, the quality of the product and the performance of that machine to make up your OEE metric. But for certain industries, if I talk about continuous industries a little bit more mining, not all three of the pillars of OEE necessarily makes quite a lot of sense to make a decision now. And one of those components is obviously the quality component. That's always a tricky thing to try and get right. Continuous industry. Now you're very modest her, because you're actually also a

publisher of a white paper for the meso foundation around the time and state measurement. But I think that might be a whole podcast with maybe you and Doctor Kweivis on another podcast just to explain.

01:00:38
Speaker 2
But I just wanted to get the listeners to also just think about what is these metrics or KPI's that they want to measure? And for different industries they will be different. You know, you're going to struggle to try and, you know, have a cap that's going to fit all correct.

01:00:54
Speaker 3
Yeah. So, and that's why I say what's the intent of what you're trying to do and how are you going to measure whether or not you're going to get the correct results? And you know, if you, and sometimes, and especially now in Covid, you know, we used to make three skus, right, or stock keeping units or products, but now we've added five because we're also now making hand sanitizers and these dispensers, etc. Etcetera. So we've doubled the number of stock keeping units, the number, the types of raw materials and the types of products that we have in our stores, as well as the types of processes used to actually make that. How do you disseminate that into your factory? Right.

01:01:56
Speaker 3
Because now we're nothing talking about, you know, we're focusing on throughput, and throughput is the measure we also now have to start looking at. Right. So what's my, what is my change over time?

01:02:09
Speaker 1
Yeah.

01:02:10
Speaker 3
You know, because we're now looking at product mix. So we actually going to make the most profitable product for the demand. So if there's a demand for the most profitable product, the rest of the products can actually be a bit late. So we're not going to meet the available to promise for those products, but the most profitable one, we are going to make sure that we meet the available to promise times for those because it makes us the most money. So it's not about throughput. If we have to change over a lot and lose throughput, it's okay because we're making the most profitable product as opposed to previously we only looked at throughput because if we made product, we could sell it. Now we're making product, but we're also making the most profitable product.

01:03:03
Speaker 3
So when the business environment change, what you measure needs to change. And talking about that, the time and state is also one of those things where you take that into consideration. So the measurement changes based on the market forces out there or potentially, yeah.

01:03:28
Speaker 2
So in a nutshell, you need to be able to pivot very quickly around those different things. So, and these days, again, technology is to our saviour. Space is not an issue anymore. We can now historize more raw data than we ever was possible at faster rates. So get that data in, start historizing stuff, start getting those real time data points in and it will allow you in the future potentially. Again, who knows, next year we might need to make 220 skus, but the data is available to pivot very quickly around those new KPI's that you need.

01:04:01
Speaker 1
To measure and the ability were to be agile to do it quickly.

01:04:04
Speaker 3
Yeah, 100%. And we can all hope that we will start, we will end 2020, release two very soon and start really starting 2021.

01:04:17
Speaker 1
Absolutely. Just in closing, the, you mentioned there's a lot of good tech out there. There's a lot of good technology available from a lot of different vendors. The tech is available. I think the people in our industry, the individuals, we are very resilient. We are very resourceful. I know your team at Iritron. You're a great leader and a good educator, and that's why you, in your role at NISA, you've surrounded yourself with a great team. Is there top three?

01:04:51
Speaker 2
Maybe.

01:04:51
Speaker 1
I don't know, things. Observations around specific applications or trends or just your top three things that you're excited about for the MES space over the next couple of months. Maybe we've touched on them already, but maybe in closing, if that's okay.

01:05:08
Speaker 3
Yeah. So what excites me for. For the future is the ability to start predicting things. Okay. So, looking at, you know, that early anomaly detection, equipment failure prediction process performance forecasting, that tech is something that is becoming cheaper. Right. And more user friendly. So, you know, historically, it used to be only a data and data scientist could actually do it, but they've built some tech that actually takes away the work of the data scientist and just gives you the results, consumes the information, gives you. I love that. The other thing is the popular or the view of a unified architecture is becoming real. So, as Lenny said, part of the meso education, we talk about manufacturing 2.0 and a manufacturing services bus bringing all these things, tying them together without ripping and replacing any technology.

01:06:36
Speaker 3
Now, it was always kind of a bit of a pipe dream because the tech wasn't available. The tech is now almost there. Right. So I won't say it's there 100%, but it's almost there. So those are two things that I've noticed, and that actually.