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Paul Thies: By leveraging data-driven solutions such as IoT sensors and data acquisition, integration, and analytics, asset managers are discovering a host of cost efficiency and asset lifecycle benefits. Recently Airservices Australia, Australia's national air traffic control organization partnered with Jacobs to deploy intelligent asset management functionality as several radar sites.

To learn more about how these two entities came together to successfully implement an intelligent asset management solution in such a safety-critical industry as air traffic control, we sat down with two of the key professionals behind the project's success. Hello, I'm your host Paul Thies. On this episode of *If/When* my guests were Graceson Scariah, CNSNA asset lifecycle management lead, Airservices, Australia, and Abhishek Singh, director of technology convergence at Jacobs.

During the discussion, they shared their thoughts on some of the top benefits that intelligent asset management can provide, as well as methods that organizations should consider when trying to deploy intelligent asset management in their operations. Well, Graceson and Abhishek, thank you both so much for joining me today. We're going to be talking about intelligent asset management.

I want to ask you about the AMPEAK 2023 event. I understand you both recently attended AMPEAK 2023, which, for our listeners at home, it's the annual conference of the Asset Management Council. This event just transpired here in April 2023. Abhishek, can you tell us a little bit about that experience, what did you learn, what new developments or findings came out of that that you think are sharing with our audience?

Abhishek Singh: Just to set some context for our audience around AMPEAK, AMPEAK is the premier asset management forum here in Australia that brings together asset owners, asset service providers, and a number of engineering and consulting organizations all under one roof with the intent of providing them a platform to share their experiences and learnings that have come out of a number of innovative activities, some incredible work that's being undertaken by these organizations in support of critical infrastructure providers so that it enables these providers to get greater value from their physical assets. That's the concept of AMPEAK.

In the conference, there were a number of themes that emerged out of the presentations and discussions. On one end of the spectrum, there was discussions around some foundational elements of developing the right strategies, putting in place the right plans and policies so that organizations can achieve the right balance between performance, cost, and risk as it pertains to operating these physical assets. That was on one end of the spectrum.

The other end of the spectrum, we had discussions around themes that related to fast-tracking adoption of emerging technologies as a means of bringing in a paradigm shift, I suppose, in the operations of these organizations and in the way that they manage their assets. For Jacobs and their services, we work as a joint team and we made six presentations on topics covering some of the things that I've mentioned.

The presentations were really well-received by the audience, the participants in the conference. A particular highlight for me, Paul, pertained to discussions that we had around adoption of a data-driven approach and how that is enabling organizations, in particular asset-intensive organizations, to deliver some sustainable outcomes.

Now this, of course, resonated with me, because it aligns with the accelerators that Jacobs has set up around digital and data and climate response. For us, it was heartening to see perhaps that, in some ways, because of the work that we've done as part of the accelerators, we are perhaps ahead of the curve, and that we can make a real difference by pulling on these levers and getting the right outcomes for our clients.

Paul: Graceson, you were there as well. Of course, you are joining us with Airservices Australia, and obviously, a heavily intensive asset organization, air traffic control organization there in Australia. You're rolling out intelligent asset management as part of your operations. What did you learn? What was your experience at AMPEAK 2023 from a client side? What did you learn? What did you appreciate as far as the findings and developments that came out of that conference?

Graceson Scariah: Thanks, Paul. Be for the listeners, Airservices Australia is a air navigation service provider, the federal agency in Australia to providing air traffic control and aviation rescue and firefighting at 27 airports across Australia. We've been on the asset management journey for a number of years now, and it's been setting up the foundations of asset management and building on that slowly. Recently, we've had partnership with Jacobs to enhance and uplift that capability. It was an exciting opportunity for Airservices to attend and showcase some of the good work that we've been doing with Jacobs.

As Abhishek mentioned, we did six joint presentations together. What I guess took away from it is, every agency or every company that attended is on a journey. There are different stages of maturity, and there was a general sense of wanting to better ourselves, look at the future, and to be able to build on the, I guess, the stories and the experiences from each other.

As we did our presentations, we got a significant amount of feedback from the people who listened to the presentations and really validated the approach we've taken, and validated the learnings that Jacobs had shared with us. We've got a lot out of it, particularly being the first time we had showcased to this scale before. It was a great opportunity.

Paul: That's tremendous. Now, Abhishek, let's unpack intelligent asset management for our audience and the concept behind it. Obviously, this is a very data-driven world and a lot of organizations are applying data-driven solutions to any number of situations. How would you explain what intelligent asset management is, and what are some of the top benefits that it provides to clients?

Abhishek: At its core, intelligent asset management enables organizations, primarily asset-intensive organizations, to tap into the rich intelligence that is, in some ways, hidden beneath the surface of the mountains of data that they gather from their assets. Typically, the way we explain this to our clients is to say that if you look at the

value chain of intelligent asset management, on one end of that value chain is a focus on deployment of data acquisition technologies.

For instance, in the case of Airservices, we looked at deploying IoT sensors on their assets to gather data from their assets in real-time. There can be other approaches to acquiring data, which could be spatial data or non-spatial data. That's the first part of that value chain or equation. Then down the track, it's about integrating those disparate data sets. Once they've been integrated using the right applications to analyze the data, and the insights that are they're not paying for the analysis are applied within the context of the organization. The operating context of the organization and support the organization with some tactical and strategic decision-making.

That is what it is, in a sense. It's pertaining highlight that intelligent asset management is, before we go on and implement that, there's a need for us to put in place some foundational elements. This typically relates to some strategies that we need to develop around asset information management and how data will be captured. Once those basics are in place, we venture into bringing the technology to be able to then provide some of the benefits out of it. Typically, this journey can be fast track. In the case of Airservices, the foundational elements were put in place in about six to eight months, with the trial being completed under four months. The whole journey was finished within 12 to 18-month period.

Now, to the second part of your question, Paul, around the benefits of intelligent asset management, we broadly categorize them under three areas. The first is related to efficiency-related benefits, the second is safety, and the third is sustainability. When you look at the efficiency aspects in terms of the benefits being delivered by intelligent asset management, organizations can make significant gains by optimizing that maintenance regimes as more and more data is available, which is being analyzed in real-time. What we've realized is that over time, these organizations can then move away from a reactive or a preventative maintenance approach across to a more predictive maintenance approach. In many cases, this leads to reduction in maintenance costs by as much as 40%.

The second relates to safety benefits, and this is both improvements in operational as well as work health and safety outcomes. From a operational safety point of view, again, as we have real-time data from assets, we can improve the availability of these assets and reduce the risk of unplanned failures. Therefore, that then improves the service delivery to the end customer. Altogether, that provides the operational safety benefit.

Again, from a work health and safety standpoint, as we go out and deploy sensors on assets in areas, as an example, on top of a radar tower, that then leads to a situation where technicians are no longer required to undertake additional risk by climbing these towers and performing manual inspection activities. All of that can then be done by the sensors of the technology. That's another area of benefit.

Then the final bit is around sustainability and the outcomes that IM can deliver from that standpoint. That is really about the organization having a finger on the pulse of these assets and being able to then optimize the energy consumption of these assets in real-time. That's one aspect. The final bit is around reducing the need for

travel to remote sites, and therefore, the accompanying reduction in carbon footprint. That is a broad overview of some of the benefits that IM can deliver, Paul.

Paul: It's a key feature of intelligent asset management. The data that it captures allows for the creation of digital twins, I imagine, which then allows you to model these things, so it's like you can see ahead of time. Like you said, there's a failure imminent in a certain part of the infrastructure or whatnot that has to be attended to maybe, I don't know, six months from now or something.

Suddenly, you're on the clock and you know that you've got a potential part failure or something that has to be dealt with, and you can deal with it proactively and much more cost affordably than having to deal with it after there's a problem. Being able to reduce your costs and supply chain issues as well, because you're better able to proactively manage your assets as opposed to reactively, which can create all kinds of problems.

Abhishek: Absolutely, Paul. Just connecting the dots with something that Graceson mentioned around levels of maturity and everybody being on a journey. The digital twin aspect is perhaps something that is a higher level of maturity. As I mentioned in what I said earlier, we start by laying some foundational elements, move into a space where we bring in some digital technologies to help optimize the current situation.

Then the longer-term vision, as you mentioned, is to have a virtual replica of the network of assets, which gives you the ability to simulate scenarios in a very low-risk environment and yet be able to predict what might be the impact on end service delivery. You're absolutely right. That's the model that we have in mind.

Paul: Now, Graceson, on the client side, you mentioned, of course, that Airservices is partnering with Jacobs and Airservices is Australia's national air traffic control organization. You've engaged Jacobs to introduce intelligent asset management capabilities at several radar sites. I understand that that project was even up for an Asset Management Innovation Award. Can you tell us a little bit from Airservices Australia's standpoint, what were the drivers for change that led you to seek out an IAM partner?

Graceson: As we've all been through the difficult COVID times, we've learned to look inwardly and see what improvements we can make. Operating in a very safety, critical, and highly regulated environment, we have a number of challenges, and particularly with aircraft not with border closures, aircraft not flying creates a significant revenue volatility for us because we are funded through charging the airlines as they fly. In the other aspect we had through the pandemic was a number of lockdowns that were either by state or by city councils, which meant you're not really able to move around.

We use a hub and spoke model for our maintenance. We have maintainers located in particular cities, and they drive out to some of our remote sites. We noticed a number of difficulties in being able to achieve the timeliness of response, et cetera. These, together, pulled a bit of a retrospect look at what do we need to do if this becomes commonplace. How do we plan for this and how do we design a system that can help mitigate risk of unplanned failures?

This is where Jacobs stepped in and helped us build this out and enhance our capability, and particularly to be able to digitize a lot of the methodologies and processes that we've got at the moment. A lot of our processes are what we call time-based. With this particular technology, what it opens it up to is moving to potentially condition-based and being able to even build into a bit more predictive maintenance. That gives us a view that, like you mentioned before, that you can tell that you need to probably get to this side because it's starting to hit the margins of tolerance at the moment.

Paul: Now, great. As a follow-up to that, what have you learned during the lifecycle of this project that might be of benefit for other organizations that are exploring how they can digitize their asset management? What were some of the key outcomes and success factors achieved?

Graceson: Speaking to a lot of the agencies and other companies that attended the conference, a lot of the companies, this is on their wish list to get these ideas implemented, but there's always a cost factor or there has to be a trigger that allows other companies to invest. For us, particularly, the proof of value was really around improved service delivery. We were able to demonstrate that this actually has a positive impact on service delivery, the ability to optimize our maintenance, and having a better digital forward outlook. Those were the key outcomes that we were able to demonstrate through this process.

From a success factors point of view, I think two things I probably want to bring out. One is you need to have leadership that is aligned to this thinking. You're aligned to your corporate strategies and forward plans. Then the second important factor that allowed for success was the examples that Jacobs brought to the table, particularly of their involvement in their work with NASA, and NASA being another safety-critical organization. The insights that Jacobs brought from that example really resonated with Airservices team and just lined up for us.

Paul: Then, Abhishek, let me ask you, looking forward, what excites you the most about intelligent asset management development in the coming years?

Abhishek: I was reflecting on our journey so far and even more broadly on what's happening across the industry that we are part of. It's absolutely an exciting time to be here at this time because of many factors, one of them being around the technology evolution, some might even call it revolution, taking place around us.

In terms of the future plans for intelligent asset management and what we are most excited about, two things come to mind. The first is now that we have a proven use case for intelligent asset management with Airservices being an aviation client, we are now actively working on scaling this model and the IM capabilities that we have across other sectors in APAC, in particular.

Many of our audience would know that Jacobs has a strong presence in transport and utility sectors globally as well as Asia Pacific. Work is afoot to leverage our client relationships that we already have in these sectors to be able to provide a tailored intelligent asset management solutions that hits the mark and meets the needs of our clients in these sectors.

I strongly believe that the adaptive model that we've developed for intelligent asset management through the work that we've done with Airservices, that can be taken and it's transferable across these sectors. We are putting our minds to it and doing some work on that aspect.

Furthermore, the approach that we've taken to engage with clients and also, I suppose, the approach that we took of engaging with Airservices around understanding their strategic priorities and then working as a joint team to co-create a delivery methodology that is suitable for their operating context is, again, scalable across other sectors. Sectors that typically have asset-intensive organizations that are highly regulated or they focus on safety-critical outcomes. I think that is something that really excites us as a team.

The second aspect is related to the opportunity of potentially bringing in some of our global partnerships with technology platform providers. Example of that could be, let's say, Alan Pierre, there might be others into the mix of our intelligent asset management offerings to better support the needs of our clients in Asia Pacific. My understanding is that a number of use cases are already being developed as part of these partnerships for specific clients in the US and elsewhere. As I said, we are actively working on developing some use cases in Australia.

I think that'll be absolute game changer because that will provide us and our clients access to some cutting-edge artificial intelligence, machine learning algorithms, and capabilities, digital twin capabilities, something that you mentioned earlier. Again, applying this to address some of their trickiest problems or challenges would really help us change the situation and bring in lots of benefits for our clients in these sectors. In a nutshell, these two areas of scaling IM across sectors and then leveraging technology partnerships is really what we are focused on as a team here in APAC.

Paul: It's exciting when you mix and match the technologies together. It's bringing in better management of the data that is generated and then feeding that into your machine-learning models. Then eventually being able to put together a digital twin replica, layer in advanced processing capabilities. All this technology together, it works together, and exponentially, it gets better and better and it evolves and provides even better service, better sustainability endeavors, and frankly, better safety efforts as well.

Now, my last question is for both of you, and I'll start with you, Graceson, and then Abhishek, I'll let you have the final word, but Graceson, let me ask, what do you see--let me caveat this, right? There's all this great technology and it's wonderful, but honestly, in the way of the world, operations, they've run for a certain way. People have a legacy way of doing things. Sometimes they're a little reticent about rolling in new technology. It's a bit disruptive even in the best cases, even positively, it can be a little bit disruptive.

This question's really about overcoming that disruption and folding in new technology in your workflow. My question is, what do you see, Graceson, as the key to encouraging organizations to invest more in something like intelligent asset management research and development? What are the best methods that they should consider when trying to deploy IAM in their operations?

Graceson: Yes, look, that's a really good question because we ourselves grappled with this because the art of the possible is very, very high. Where do you start? My recommendation would be to do-- the use of pilots are very powerful. Start small and identify a particular area within your business where you think you can demonstrate value and to be able to pull that together in a smaller scale and to be able to pull the data from that and to be able to effectively have a play with it, and you can draw insights by doing it in a smaller scale in the first instance.

That helps you understand the technology better, understand the connection points into your business, and the insights that are important to your business because every business is different, and you may have high-level objectives that may look the same, but internally, the connection points are quite different. Starting small and having an open mind as to what the art of the possible is what I'd say a good way to try and get your feet wet, if you like.

Paul: Excellent. Then, Abhishek, the same question for you. What do you see are the keys to encouraging organizations to invest more in IAM and get it deployed across their operations?

Abhishek: With most organizations these days, there's often a larger transformation agenda or a change agenda, as was the case with Airservices. I think as we are conceiving or putting in place the concept of intelligent asset management within the organization, it's important for us to link it with the broader change agenda and make sure that there's complete alignment.

I think another aspect just in connection with that I'd like to mention is, often, digital is an afterthought, which is not beneficial. Therefore, organizations should take that digital by-design approach of bringing this into the initial stages of discussions and putting together a broader change program. Then in particular for intelligent asset management, start building a vision of what those steps might look like. I spoke of foundational optimizational and transformation capabilities as an approach that we'd considered for Airservices, but there might be other ways to do that as well.

Then accompanying the vision is sort of a narrative, and the narrative is really important to obtain the buy-in of all key stakeholders. Something like IM cuts across boundaries within the organization, and just one part, one functional area of the organization cannot implement that on its own. They need to get buy-in from stakeholders, and I think that vision and that narrative is key to being able to build that engagement with those stakeholders.

As we talk of stakeholders, I think most organizations would agree that their people, their workforce is probably one of their main stakeholders. In fact, people are often quoted as being the most important asset that organizations have. It's also important to leverage off that initial vision to build engagement strategy with the workforce and help them understand how their skills would evolve over time as intelligent asset management spreads across a greater part of their asset base, and then there's a need for them to shift their operating model.

That serves the purpose of coming together with common understanding of how the workforce needs to develop its capability. I think that would really serve these organizations well. Of course, the key there it's not just about bringing technology for

technology change. We want to bring in elements of technology that help deliver sustainable outcomes, so changes and improvements that would stick in the long run. That would be my suggestion, Paul, which is connect the dots, take a holistic approach, think at a systems level, understand how all the moving parts come together, and then develop a bit of a vision and narrative around that.

Paul: Well, it's excellent advice. Don't just focus in on the new technology, the new shiny toy, but really focus on what are the outcomes, the sustainable outcomes you're trying to achieve, and then deploy the technology in a way that's going to help you meet your strategic goals. Well, Graceson and Abhishek, I want to thank you both so much for joining me today to talk about intelligent asset management. I really appreciate your time.

Abhishek: Thank you, Paul, so much for the opportunity.

Graceson: Yes, thanks, Paul. Appreciate it.

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