Arthur Jones (00:06):

How can we modernize airports to be better for passengers, communities, balance sheets and our environment? It's a complex challenge that can't be solved by talent or policy alone. It also requires the right application of digital tools and technologies. These transport hubs play a vital role in our communities and economies. And to empower a better, more sustainable future for all, we need an elevation and industry-wide innovation and collaboration. Our guests for this episode are leaders in this field, Ersin Inankul, Head of Aviation Digital at Jacobs, and David Miranda, Associate Partner at PA Consulting. So, the aviation industry globally has been growing past pre-pandemic levels, but now it faces conflicting goals with decarbonization and the needs reduced environmental impact and build resiliency while still driving commercial growth. So David, what would you say are the biggest challenges the aviation industry faces right now, and how are Jacobs and PA consulting strategically partnering to solve for these challenges?

David Miranda (01:13):

I think it's probably the biggest thing that we're concentrating on in collaboration with Jacobs is a proposition we are calling Intelligent Airports. There's the re-emergence of AI and the advent of GenAI, we are seeing as a big sort of motivator for lots of companies in lots of industries to address how they're going to support these emerging technologies and airports are no different. So we have a whole proposition called the Intelligent Enterprise that we've now filtered down to be specific to aviation called Intelligent Airports. And I think one of the key things that we're trying to address is that journey of airports going from the automated airport. So I think '95 to 2005, you see the implementation of robust ERP systems and streamlining of efficiency through the use of software to then let's say the digital airports of 2005 to let's say 2024 where we are now.

(02:20):

People will still talk about the digital airport, so that's using IoT, advanced data analytics, leaning on cloud technologies, real-time monitoring, things like that. But now what we're trying to do is push that further and say, "Oh, actually you need to start thinking about the intelligent airport." So this is about leveraging data and AI technologies, data-driven solutions to enable things like personalized passenger services, advanced security measures, a multitude of things really across the entire airport operating model and capability model. So I think that's one of the major things that I know that we're working on and we're trying to weave this through all of our work at the moment. So Ersin and I are working with a well-known European hub airport at the moment, again, just looking at the foundational elements that are needed to actually support these technologies in the future.

Ersin Inankul (03:27):

Yeah, I mean, I'm going to look from the other perspective. I mean, what's the big challenge right now for me

is the demanding at aviation. Because after this pre-pandemic, now aviation is really strong bag. We were talking about 2023 number, 9.2 billion passenger and 5,000... I mean airlines available right now, we're talking about 17,000 commercial airports and around 30,000 aircraft on the air right now. And the expectation for 2040 is going to be 20 billion passenger and all the numbers is going to be like 30 or 40% increase. This demand is going to be, of course have a lot of challenge plus a sustainability impact as well. The technology can help a lot for how they're going to be be overcome the sustainability issue. Of course, airlines and airport is going to make a lot of things, I'm talking about how they're going to be used, sustainable aviation fuels, hydrogen or all the airlines not making a lot of investment for changing their fleets with the new technology crafts.

(04:47):
That's going to be help a lot. But I mean, the technology perspective, AI has a lot of functionalities, like making some prediction on the flights back and passenger increasing a number of the efficiency items at the terminals. And increasing with on time performance for arrival and departure will help a lot for airlines in airport to spend less carbon and making more happy passenger and efficient airport. And not only for that one, as David also mentioned, we are also working with very big clients and giving advice for how the infrastructure is going to support all the demands, new investment airports, extension of the airports, putting smart infrastructure within the IoT, using intelligence sensors to collect the data from everywhere. And using renewable energies and this making more smart in energy management, light management, building management or scalar systems. We are going to help a lot for our sustainable feature and also we're going to help a lot for effective and the more optimized airports.

Arthur Jones (06:09):
So, Ersin, you mentioned quite a few things there in terms of technologies and obviously the sustainable fuels and a lot of great advances happening. But if I had to drill down and ask you what would you say... I mean, artificial intelligence obviously sounds like it's a big thing, but we have seen that there's quite a bit of hype around GenAI and AI and there's not many results being shown right now in terms of concrete results. How do you think that's going to change and how do you think it's going to be applied with these intelligent airports going forward?

Ersin Inankul (06:41):
Yeah, it's a great question. I mean, because whatever you're seeing last two, three years for AI is all around with LLM model. I mean, language model is just going to be helping us to get the data and correlate this data and find a new wording or getting the intelligent search, collecting this data and giving them more accurate results. But what I'm believing in the future of AI at the airports, AI managed airport is not a concept right now. Now we're talking about how the AI is going to be really managed, all the integrated system at the airport.

(07:17):
Because airport itself already, if you're talking about a middle airport, which is like 20, 25 million passengers aboard, we're talking about 40 or 50 systems already integrated. If you're talking about a big hub, 60, 70 million passengers, that means you have all the hundred systems already talking each other. This means this a smart building, getting us all this data using for decision making is the future of AI at the terminals. If you're going to get the information from your check-in passport, real time queuing and predict your delays with AI or can make your simulation 180 days before, this simulation 180 days before. This is the future of aviation. And the AI is going to be future not only for data and the operational perspectives, but also for cyber. Because threat analytics, because we are together with PA and Jacobs, has a lot of investment on the cyber. We are also working many big clients for helping for cyber framework. But AI is also going to be like a feature how the threat analysis or big data analysis with cyber framework avoid from the threats, from any kind of threats from the airports. That's going to be like some of the best use cases will be with AI at the terminals.

Arthur Jones (08:50):
So Ersin, I know you've spoken a bit about there about safety and the threat of the hacking and cyber danger, but I'm going to ask David now, moving away from the kind of bigger subjects that you brought up there and look more about the passengers experience and specifics. So David, what would you say are the best kind of digital innovations within the passenger experience that you could share?

David Miranda (09:11):
AI is quite a big term. It's quite a broad term. And I think when people think about AI at the moment, because of this advent of GenAI, they only think about GenAI, right? So GenAI is great. We see what benefits it has, and I think even within an airport it has a lot of benefits, but traditional AI is also improving at a rapid rate.

(09:34):
So just being able to get data-driven personalization services. And then I think that filters in, to answer your question on passenger experience biometrics and contactless technologies, the sort of augmented reality as well. I think it can also play a part. So the ability for people to walk around an airport. And Ersin, you might know more about this 'cause I think Istanbul are doing it, where they have a sort of AR view on your phone and it gives you real-time services that you might be interested in as you walk through the airport. Really cool stuff.

(10:13):
So yeah, I think there's lots and lots really. But yeah, I think it's important for people to understand that there is a difference between GenAI and general AI. And general AI is still very, very much underutilized I'd say. And the two technologies bounce off each other well. So for example, you can improve your typical AI with data that's being generated by GenAI. So GenAI is also playing an interesting role in turbo-charging your

normal AI and your ML models.

Arthur Jones (10:44):
I mean, the more I hear you speak, obviously data plays a massive role. And Ersin, you briefly mentioned how important AI and GenAI can be to help safeguard that data. But how else can airports safely use data insights to drive performance? What are the other ways they can do that?

Ersin Inankul (11:03):
Yeah. It's like data is a new world. We are talking about this new, I mean, the sensors that we're already using everywhere. For the small buildings like airports, data is everywhere. I mean you can use this, as David mentioned, personalized passenger services. You can catch your passenger from home with your mobile app and engage with them through the way, giving them a lot of information before the flights about the airports, about these flights and any kind of new campaigns. And you can engage through social media to get this, their, I mean, intention about real-time campaign at the terminals.

(11:48):
And also biometrics is one of the key items. Using face and using the tickets and the passport information, creating a data set, using these data sets at the check-in passport and entering the aircraft. Like sharing this data also so critical because you have data for land side, air side, for ATC and improving for the turnaround management.

(12:13):
A lot of data is everywhere. The importance, how they're going to be shared this data, how they're going to be collect and put a safe environment, how they're going to be ... make a governance on this data because at the end, the owner of the data is the big questions because airline is always saying, "I'm selling the tickets. This is my data." But airports should get this data, process for their operation efficiency and passenger performance. But at the end the data, if they're going to be collaborate and the sharing, that's the key.

(12:49):
Now the European airport just starting a program called Airport Collaborative Data Sharing. It's like it started 2005. First airport was Munich. Now 37 airports already certified from EUROCONTROL and is increasing. I mean many airport in the world, US, Middle East try to get the certification as well. Why? Because you're sharing the data. Airlines, ground handlers, ATC tower, terminal operator sharing this data and everybody's benefiting from that.

(13:24):
But of course safety and security is the key. Who is going to avoid this data and who is going to be manage this data? All starting from the governance. Make a proper governance for the data and then putting a risk assessment on the place and then creating a cyber framework. This is the key. We are also working with many clients, kind of how they're going to be collecting data first, putting a framework for cyber and how

they're going to collaborate with the stakeholders with secure manner. And then the last one is how they're going to train their staff because the data is creating by the staff and the systems.

(14:07):
System side is a bit easy because you can avoid a lot of weight that can be avoid this for threats, but how they're going to be trained your staff to be put your old data from a safer environment. This is step by step that how we're going to be secure the data, how we're going to be benefit from the terminals and airports.

David Miranda (14:29):
Yeah, I don't know about you Ersin, but I kind of see a trend within the airports that I'm working with where their data maturity is pretty low I'd say in comparison. I work kind of cross sector a little bit, right? So let's say consumer and manufacturing for example. I tend to see a much higher maturity than I see within airports. And the thing that you'll probably hear me banging on about a lot is data foundations. It's great talking about AI, but unless you have that data foundation in place, then there's no really much point in talking about AI. You might be able to build a POC here or there, but you're never going to be able to productionize it unless you have a mature central data platform, and like you say, Ersin with the governance structures around it, with the operating model around it, with the adherence to security around it. It's a trend that I see within airports that it's not something that they've considered much.

(15:35):
And also the thing that I also see is that the merging between operational data flows and integration between systems and analytical, let's say, your central data platform type data, yeah, they tend to still think the two things are the same and you use the same technology platforms to service them all. It's with the same technology platforms to service them all. It's changing. I think people are coming along, doing data... We do data strategy as well at PA.

Ersin Inankul (16:11):
This is a great point, because I mean, from the airport perspective, last 10 years, airports like using data for only for the dashboards and putting this dashboard for operations. And they're going to be see how they're going to be putting performance, putting some KPIs, using data.

(16:29):
But last, because as Jacobs we also have a lot of platforms using this big data management analytics like satellites or Aqua DNA. We are partnering with a lot of initiatives for data management. Now the trend is using this data and putting some analytic algorithm for airport efficiency and enhancing passenger experience. These two things is going to be key to use this data. If you're going to somehow using this data to make some prediction on early arrival or any delay on the fly, then I can give this information to my passenger through the screens or mobile apps immediately.

(17:16):
Or I can give them real-time information from the terminal that, "Hey, guys, you already have delay but your airline is making 10% off at the launch." That's the power of the data. Then you can turn this use cases for revenue generation or optimizing the operation or creating new value-added services.

Arthur Jones (17:41):
What I found, and I mean obviously this is getting quite technical, so I'm just going to take a few steps back. David, just so I understand what you were saying earlier with the data maturity, are you saying when the processing and the maturity of the way we handle the data gets better, that'll obviously help with the gen AI and the AI and whatever else we want to do with the data and actual the processes? Is that right?

David Miranda (18:03):
Yeah, totally. Exactly that. We talk a lot at PA about data foundations. We have clients coming to us saying, "Look, we really want to use AI." And yeah, our reply is, "Yeah, we can do some POCs for sure. Give us some data sets, we'll give you a data scientist, a data engineer. We'll build out a POC for you, but you're not going to be able to productionize it on your current environment because you don't have the real-time data flow. You don't have the data from several different sources flowing into a central point where that data can then be mined and used in interesting ways." And yeah, I think airports are in particular quite behind on that trend.

Arthur Jones (18:54):
Then I've got to ask you, what is a POC, just so I can explain that and understand it.

David Miranda (18:57):
A proof of concept. A proof of concept. Yeah.

Arthur Jones (18:59):
Thank you very much. Okay, great. Then that makes total sense to me, David. And it's really interesting to hear because it sounds like a great opportunity for airports. And then hearing what Ersin says about how it's adapted or even changed in the last 10 years is amazing.

(19:11):
And it also leads into the next question, which is, I mean in the past digital integration capabilities have been added in the later stages, almost as like add-ons to airports rather as being thought of right from the beginning. But obviously now it's changing where digital's driving a lot of the concrete decisions that are made and what's being built.

(19:32):
My question is how do digital place-making and master planning contribute towards better airports? Considering what you've just said, David, about data architecture and foundations and what you said earlier as well, Ersin. I don't know, maybe, Ersin, you want to start us off with this one?

Ersin Inankul (19:48):
Yeah. I mean this also really are challenging things that because most of the airports is going to be like, I mean the Brownfield or the Greenfield, the construction time is so long. They're going to start to build the terminals, it took minimum of five to 10 years to finalize all the activities and opening the terminals or making an extension. But to be at the safe side to be from the technology perspective, if you like to be future-proof, then you need a methodology.

(20:22):
You're going to be put a methodology that's going to be in line with the construction activities or if it's going to be a Brownfield terminal, how they're going to be migrate the systems and everything. This type of client that we're going to helping with the digital master planning, which is going to be a bit new. And starting from the as-is analysis, we're going to sit with the client and listening them. We also making a good two example with PA right now.

(20:54):
Visiting with the client and understanding their needs and their future growth potential and putting them at a roadmap and the to-be activities. What kind of technology maturity level they're going to be achieved, what's their gap? How they're going to be achieved this way? And then we're starting to make a design starting from infrastructure, applications, AI, big data management, then putting detail of this design. Then if you'd like to have, because the digital master planning is going and finishing with test and commissioning activities. Or if they would like to be part of the journey, concept of operation or operation readiness.

(21:45):
This is three steps. If you're going to make as-is to be an implementation, then you're able to support them for how they're going to be operate with all the systems and application at the terminals, plus how they're going to be ready for operation. This we called ORADs. This CONOPS and ORAD is a key items that's starting from RSS. Maybe it's going to be take three to four years, but it's going to be very in line with the construction schedule.

(22:18):
And you are always be at the middle of all the processes, construction, data, implementation, clients. And you're putting a smooth journey for them to be finish everything on time, finishing on the budget and opening a terminal with a smooth operation. This is our understanding of the digital master planning. And really we are so powerful with PA with this area, with all the SMEs. We are also working with so big airports right now. And there is a feature for this at let's say within didn't all this demand for 2040 targets.

Arthur Jones (22:57):
David, do you have anything you'd like to add to that or that you-

David Miranda (22:59):
Yeah, my knowledge on this particular topic pales in comparison to Ersin's because he's lived and breathed this through his experience. I think the only thing I'd add is I come here from a perspective of a pure technologist. And I think it's really important that airports in particular have this sort of digital first approach.

(23:26):
I think Ersin already mentioned that traditional infrastructure projects had digital come much later in that life cycle. But the trend to see that being woven into the early design conceptual stages of projects is a good one. And then embedding things like embedding smart service design, embedded devices into that design as well so you can have beacons and things like that. Because often building these things in retrospectively- like that, because often, building these things in retrospectively is really difficult and expensive, so building it in from the start is super important. And then the last point I'd probably just add is on user- centric design. So, again, this is a trend that we've seen in other industries happening for a long time, so especially web industries, where you have, it's all about usability and how quickly you can get someone to click the buy button and convert that customer. I think you're seeing the same thing now with just your general services within an airport. It's like, okay, actually we do need to really make this a user-centric design. So, I think digital placemaking can use technology to improve passenger experiences by designing airports around the needs of users.

(25:01):
And I mentioned AR, augmented reality, already, but also things like optimizing layouts for efficiency. That's another really important factor in there and understanding passenger flows and how you make that experience even when the airport's really busy, how do you control passenger flows so that everyone's having a good experience? You don't have people sort of bunched up in a particular area because you don't have, people haven't opened those particular gates or staff aren't manning those areas given the high throughput for that particular day based on the flights that are coming in. Yeah.

Arthur Jones (25:47):
So, you both mentioned, several kind of impressive technologies and innovations and even Ersin, it was fantastic to hear about the digital master planning and what level that's gone to, but if I had to press you both to ask you for one digital technology or innovation that you've seen that you're working with now that you think should be standard across all airports around the world, what would that one technology be?

Ersin Inankul (26:11):
From my perspective, we were talking about 20 years ago for how the collaborative decision making,

collaborating the data and how they're going to be benefit for this data. Now, we're talking about a holistic approach for total airport management. Now, this is going to be future of all these big airports because at the end of the day, first 20 big airport in the world already integrate their systems. They already have the sharing data. They already using some use case of the AI, but this total airport management is going to be focusing more not only for the departure journey and also for the arrival, transfer, and the land side of the activities. This is also like a data sharing things that not only communicating with the airlines or the grand handlers, you're going to navigate the data from the financial departments, security lines, passenger queuing, or any nautons at the air side or grand moments like collating all this big data and make a prediction for the arrival and departure and sending this information real-time to all the stakeholders is the future of the terminals.

(27:25):
Why everybody's going to be talking about optimization? How they're going to optimize their resources? Because to building a new terminals is so costly. Now, everybody, we're going to be focusing for how they're going to be used there, more accurate way for their runway, check-in islands, backdrops, or passing processing type of devices, that this new approach with total airport management, which the Eurocontrol, SESA, and ACIs try to be part of this journey and that they will like to be given first certification at 2026 is going to be, I think future of the aviation.

David Miranda (28:06):
I can't get away from the fact that a lot of anything will be possible once you have your core foundations in place. And so, I think it's just super important that no matter what airports want to do, like I said, you can build out proof of concepts and they're really interesting things that airports are already doing with the data that they have. But I think to really exploit that data, to really capitalize on the emerging technologies, you really need a strong combination of data strategy and integration strategy. And that basically means, okay, how do I get all of my data from these various sources within the airport into one place or a couple of places that then makes it easy for us to build data-driven products off the back of it? And I think airports are really struggling a little bit with legacy technologies because you have these long- standing AODBs and AOP systems, baggage handling systems that are really difficult to change, and they're kind of held to these vendors who haven't also changed for a long time.

(29:25):
Right now, they're starting to get a little bit of pressure put on them and they're starting to change. But yeah, I think it's an interesting question that airports need to really answer. How much are you going to just let the vendors of these applications hold you down versus do you take some of those in-house and build those out with the view that you're going to have more control? It's not an easy question to answer because then it comes down to, do you want to build teams of software engineers or not? But it's just super important to have those foundations right, so that you can do all of the interesting, you can use all of the interesting technologies that we've already started to talk about in here and a whole lot more that are going to become a reality for many industries in the next couple of years.

Arthur Jones (30:23):

Thank you both. I've learned a massive amount, especially around digital master planning, around the rule of data foundations. It's all crucial. And I think that, like you were saying in the beginning, with the rise in projected passengers into the billions, 20 and 40 billion passengers, like you were saying earlier, data and technology is not just a nice to have. It's essential for the future. So, thank you both for the podcast. I really appreciate both of you.

David Miranda (30:51):

Thank you.

Ersin Inankul (30:51):

Thank you.