accenture

INDUSTRY X, CAPITAL PROJECTS, CONNECTED CONSTRUCTION FIRESIDE CHAT

VIDEO TRANSCRIPT

Andy Webster: Hi, I'm Andy Webster a Managing Director in Accenture, responsible for our capital projects practice within Industry X. Industry X at Accenture is all about the future of making things, and the very things we make by embedding intelligence, and for Capital Projects, that means, modernizing the infrastructure, engineering, and construction business, not just for our owner clients, but for the construction contractors and the suppliers within the entire supply chain.

Capital projects are complex, many participants, and many processes. That complexity often results in cost overruns and schedule delays and missing the original project objectives. In fact, our most recent research indicates that nearly 70% of projects run over budget, or over schedule. And in fact, the largest projects the mega projects, are even worse. Today we're going to explore how Connected Construction can make a difference in capital projects performance, I'm delighted to be joined by a Anand Desai who leads our work in Connected Construction Anand, could you maybe share a little bit about yourself?

1.15 Anand Desai: Thanks, Andy, yes I come with more than 18 years of capital projects project controls experience, both home office and construction site. I've worked with the owner operators, global EPCs have worked in the US, India and the Middle East, majority of my experience has been with oil and gas but I've spent a good amount of time, in commercial and infrastructure projects as well.

1.37 Andy: Thanks Anand for joining me today. And so you've worked across industries and seen a lot of different types of projects, what are the types of complexity that we are seeing challenging projects that lead to poor construction performance?

1.50 Anand: Andy in my experience, you know, one of the biggest things that I have seen is lack of access to near real time information on a construction site - near real time information around your people, material equipment on site, what actual work is happening currently on site and then information, real time information about identifying the leading indicators that influence your CPI which is your scheduled performance index and the cost performance index on your site. All these create pain points, number one cost overruns schedule slippage, and this is no secret when you have schedule slippage and

the cost overrun, there is an impact, immediate impact on safety on construction site. People tend to oversee safety, and then rework, you know, if you don't have the right information right tools to communicate with your teams, there is definitely potential very high potential of rework, again, which adds on to schedule slippage and your cost. And what I see for my experience is without having this real time information in the hands of construction planner, scheduler, even project controls or construction manager, they are not able to plan their future work by looking at what happened in the past. for example, if there was an issue that happened in the past, it is actually happening today, and it will keep on happening across the rest of the lifecycle of the construction project, there is no lessons learned cycle happening. And at a very high level, the way it is impacting our clients as you know, they're losing trust of their partners, their sub contractors, and they are losing competitive advantage in the market.

3.22 Andy: So, those are all challenges that really the industry has suffered from for quite a long time. And you know I don't know that we've seen a lot of tremendous change, definitely in the technology side of the industry until here recently and from a process and methods standpoint, a lot of the methods are still the same as they would have been 50 years ago. So, you know, are you seeing some practices or methods, kind of change in, you know, the clients that we work with that are trying to adopt new ways of working to address these challenges.

3.59 Anand: Yes definitely, you know, with my exposure to construction site with multiple clients that I've worked with lead construction techniques, one of our oilfield services companies who build rigs across the globe has heavily invested into lean construction techniques focusing on the materials, they were losing a lot of materials there was a loss of materials on site, especially when the materials had to move across borders, you know, go through customs so they were seeing a lot of delays because of that, so they are adopting lean techniques, advanced work packaging, it's a it's a fairly old concept but a lot of people are now adopting it. One of our major oil and gas operators have has made this mandatory on every single project that they are currently executing what it does is it brings in your engineering, procurement and construction, all of them together so you can see where certain things are happening, what are the root cause and how it actually impacts your construction.

The third one is standardizing designs and the actual work on a construction site. Couple of global EPCs that we have been working with has been focusing on standardizing the designs. Number one, you know, give your clients, off the shelf, standard designs, which helps them procurement and logistics, engineering, timelines, in order to get in completing drawings, and also gives your construction crews, a standard set of instructions to do the work. So, in my opinion, standardizing designs and jobsite activities, de-risks your project. We are also seeing modularization and offsite fabrication and construction, especially around our data center clients, you know, they are going from 25% prefab to around 85% Now I understand that there's a massive amount of logistics issues that comes in, comes with it. But when you see the time to market, getting from two years for a certain project delivery to one year, I would say that's a that's a nice way to go ahead into the future.

And last but not the least, you know, we are seeing a lot of clients going into robotics you know their focus is bringing in robotics in places where it can help them not only with productivity and progress but also improving the site safety.

So these are all the practices that we are seeing coming up in the market.

6.14 Andy: You know a lot of those practices really stretch end to end across the project lifecycle. So, you know, I can imagine that in many cases you need to think early on around what you can do to adopt these practices, you know, but clearly they then impact construction. What are some of the digital solutions that we're

using that kind of live in the construction phase, to support these type of new methods and, you know, as an example, I know we're seeing a lot of analytics and IoT in the construction space in the field. But you know how are these technologies being used together, combined and are they addressing the challenges around getting data, you know where it needs to be to who and need needs to have it when it's needed?

7.01 Anand: Yes definitely, you know, I'll talk about our Connected Construction platform - Connected Construction is a platform that helps organizations realize the full potential of their people material and equipment by connecting them in real time, which there is an improved improvement and safety, efficiency, and most importantly it makes their project delivery more productive.

What we are doing is we are using IoT devices to track and trace your assets which are your people material equipment on site. By tracking what we, what the ability that, that it gives us is to identify bottlenecks, leading and lagging indicators, and most importantly, it shows our construction team, where there are opportunities for improvement. And the beauty of Connected Construction as you know, it's a platform that can sit on top of clients existing infrastructure. We have worked with clients who already have their material management system, so Connected Construction can pull the data from there and help them visualize run analytics on it, there are clients who have a partially deployed IoT infrastructure on their site, so we are able to see what they have and then bring in IoT devices where we feel there is a gap, so Connected Construction has helped our clients in advanced work packaging and visualizing their construction progress in track and trace of their people material equipment, not just for productivity, but even on the safety side.

8.24 Andy: That's interesting Anand. You know and I know from industry research that our clients in this space and the construction industry, spend between one and 2% of revenue on technology from an information technology perspective and that's lower than other industries, but still in this industry there is pressure around spending in the technology space so you know everything needs to be justified, you know, what are some of the improvements that we're seeing with clients with implementing this type of technology and what kind of specific challenges are we helping them address?

8.59 Anand: Yes, definitely. So, you know I have a couple of great examples here so we are working with one of the large EPC companies, and what they've done is they have, they were initially their pain point was they were looking at a construction in a siloed form you know they have people material equipment, and what they were seeing was when they were executing the work they had major issues on a site, either the material was missing, people were missing, equipment was missing. So, by using Connected Construction and the advanced work packaging concept that we have within our platform, they were able to bring all the three together, so when a work package is issued to a construction site. It was made sure that it had all the relevant information, you know, typical work package has project controls information, it has information about drawings, specifications, permits, safety requirements, scaffolding requirements, ton load of stuff, so we made sure that any time any work package was issued on a site, it had all the required information for seamless execution. And what it did was it immediately translated into seven to 10% improvement on our clients schedule, that's, that's a big thing when you're talking about a billion dollar project.

Another client, owner and operator, they were finding it really difficult to visualize their overall project progress, and to do, to do their constructability reviews their pain point was, you know, typically if a person goes on a site goes through the overall progress updates their P6 for their project whatever tool that they're using, comes back to the trailer and then uploads it into the, into the database and then the whole cycle takes a week, so when the construction team is looking at it, they are looking at

something that has already been done in the past. So what we did was we gave them a 4d visualization within Connected Construction, so we brought in the 3d model, and then we associated we integrated the P6 data, so anytime P6 was updated, the Oracle Primavera P6 which is a scheduling tool, anytime they updated the progress was automatically or immediately shown on the screen, and everybody on the site, everybody in the home office, all the people who are associated with the project are seeing real time information.

The other thing that we helped them is path of construction. Now this comes in really, really handy during your constructability reviews, you know it's a process where everybody sits down in a room and understands what is the sequence of activities that will happen on a construction site, because they will have to decide on the people, the material, the logistics, the procurement, what kind of equipment I need, when do I need and all those things. So, to help them with seamless construction execution, we built a 4d visualization path of construction for them, wherein we brought the work package data from their P6 integrated that with their with a 3d model, so they could see the entire project from start to finish, so they could visualize what's happening, when things are happening, if there were any clashes, if there were any kind of issues with their procurement and logistics, so they could be ready with any, they could at least see the risks that would actually come up on their construction project.

Quickly moving on to another energy client. This was what what I like about Connected Construction and overall technology is with this energy client, they were seeing that they were losing around, they were having around 800,000, non productive hours on every single site that they have in North America, they have around 150 sites in North America and they were seeing around 1000, non productive hours because of permit delays, meaning there's a contractor comes on site, he comes to work and there is no permit available for him to work, so they were seeing so many lost man hours. So by including this advanced work packaging or field installation work package into their work passes, they made sure that any work package that was released to the construction site had a permit already issued against it, so they could see an immediate impact. So, where I'm going, is you don't have to wait for three months or six months to see, get the value out of it, it was right immediately within weeks, the client was able to save or avoid the 802,000 man hours that they were losing regularly. So these are all the, you know, the immediate value that we have created for our clients using the latest technology.

13.11 Andy: The examples that you talked about there are both owner and construction contractor examples. So, what we see is this can this type of capability can be valuable, whether you are, you know on the owner side of the equation, or in the contractor space right.

13.30 Anand: Correct. I mean this is for everybody I mean a lender, a owner operator, a general contractor and a sub contractor, again, everybody might not use every single thing that we have in Connected Construction, but there are definitely modules within Connected Construction which are focused for an owner which are focused for an EPC contractor, which our focus for a subcontractor. Yes, anybody it's for every single stakeholder on a construction project.

13.57 Andy: And, you know, I think, you know, if I go back to the research that we recently did one of the big challenges in the industry is around flow of information across the company borders. So, do we see this as a solution that's a shared solution or just used by one of the companies?

14.13 Anand: No, I mean, the way I see is you know for one of our clients, they started off Connected Construction on one single project, and then they, they took the same solution, and then they replicated it across their multiple projects, which was in different regions. So what they did was they were not only getting value or getting the value of one single project they were

able to aggregate information from multiple projects into, into their program or portfolio level I would say, so there was a lot of lessons learned and continuous learning that was happening between projects, one project was doing good on steel work one project was doing good, doing good on piping, so there was shared information so they could create synergies and add more value across their portfolio.

14.53 Andy: And do you see the owner and the contractors working in the environment together?

14.58 Anand: Yes definitely, you know, I have seen situations where there is one owner and there are two contractors one of one is for construction and one is for engineering. Now, what Connected Construction does is it can site in the middle and it creates that centralized place where you can have all your standardization stuff, you know consistency in terms of your documents in terms of what kind of workflows you need, what information has to flow between contractors can also be taken care of Connected Construction. So, I mean what, in certain cases what we have done is we have implemented this with an owner operator and the owner has actually shared Connected Construction with multiple subcontractors, so this becomes one single place where everybody's sharing the information from multiple data points, you know, again, one of the contractors had very advanced P6schedule, the other contractor was using a simple Excel kind of tool so we were able to bring all of them together in one single location. So yes, I mean we have helped owners contractors collaborate on a large scale project as well.

16.00 Andy: So one of the things that you know we see with a lot of projects, depending on the industry that you know that we're in, is that you know every project can kind of look like a snowflake with uniqueness around that project and so you know sometimes the processes are different, the methods or the systems are different, you know, what can we do with this technology to harvest that data across projects and, you know, extract insights that can be leveraged not just in the project you're executing but across your whole project system.

16.31 Anand: Yes. So one of the things within Connected Construction is you know we can implement this on a single project, but we can also implement this across the portfolio. And, you know, we can take the lessons learned, what has been done on a civil work on a certain project, A, in terms of how the work package was built, how many hours was included for a work package, what kind of equipments were used, and if it's a similar situation on a project B and a Project C, we can cut the time down in planning activities we can take the same, relate back to all these other projects, so that they're using the ready lessons learned, and they are not getting into the same issue that the product, A has gone through, and we can go through the same cycle on every single project, and we can go through and get the continuous lessons learned across the overall portfolio.

17.19 Andy: So a lot of the examples that we talked about have been site based projects so whether it's a manufacturing facility or a building, a data center, you know does, you know, how have you seen this type of capability applied to projects that aren't, you know, single location oriented?

17.36 Anand: Yes definitely, we have helped, we are currently working with a large utility company. This utility company is supporting high speed rail network by providing them with substations, at every certain intervals. So, they are using Connected Construction, they started off using it purely for safety reasons, they wanted to make sure that every time they are doing the substation, they want to check the number of people coming in, what their competency is, what time they are coming in, what time they're going out. Everything was around safety and it was more like a stack, you know, they come in, they do the same work here, they take after five days they move to another substation and do the similar work in the next substation, and we were able to give them, if there were any issues on substation 1 the same, we gave them a lessons learned kind of a

program where the same thing is not repeated on the substation 2 and substation 3, so you could see a gradual improvement and how they were performing in terms of their safety. Now, we are also working with one of our 5G general contractor who's, who's installing 5G towers. So the concept here is you know, we are giving that they're actually using the field installation work package, wherein we are giving them all the information around what is needed for them to finish a work on a certain tower, and also we are also not only telling them on a single tower, but we are showing them the dependencies between the work packages from Tower 1 to Tower 2. So when if certain work package on Tower A is slowing down, how does it affect the work on Tower 2 and Tower 3?. So yes, to answer your question, we have been helping or working with clients who are in the linear space as well.

19.12 Andy: And, you know, the way they started you said was safety oriented and tracking of people and we've also also talked about tracking of assets so you know could be rental equipment as an example that you know you don't even own and it you know it's a third party's equipment so I know one of the things that you know we've done before is, you know, tap into data feeds from those third parties to bring some of that information back, you know location data as an example so you know whether, whether you know it requires putting a tag on there, you know, from our solution or just tapping into a, you know, an API to get that data, that's a way to, you know, one of the things that I know we can do with tracking people though. I know there's, you know a lot of concern in some geographies around data privacy so, you know, what are the things that we typically do to address data privacy on the people tracking side?

20.08 Anand: Yeah, that's a very good question. So, in terms of the data privacy or around the people, so I don't have to go down to an individual person to track, I can actually bring it up to a crew level, I can bring it up to an area level or even at a subcontractor level, So I can see how a subcontractor has been performing, it's a group of people working on site, so I don't have any individual person, on a site that I'm tracking. Now, for me, track and trace is not just about productivity but it's also about safety. So where I'm going, is when I'm tracking a person or a piece of equipment on sit, I'm making sure that it's safer, you know, for example for one of our large scale EPCs we track every single piece of equipment, rolling equipment on the site. For example, they had a water truck, moving across the site, we put a beacon or a tag on top of the truck so whenever it was moving around the site, it created a dynamic hazard zone. So what happened was, if a person on another piece of equipment came in contact with the hazard zone. Both of them were, you know, they were intimated that you know you guys are in a, in a danger zone so you need to move out. The same thing around people. So one of our chemical clients what they did was they had a safety ratio on a site, they wanted to have X number of safety supervisors to x, y number of construction workers on site, so they were tracking that on real time basis so whenever the ratio went in the wrong direction, the construction team was immediately notified saying that hey you need to send two safety officers to zone A or zone B and what it did was it gave them an immediate improvement on their safety numbers, you know when you have the right supervision on site, you get the right work and the people are working safely.

21.50 Andy: So in that case it's you know it's still a lagging metric, but they're getting the, the, the information more really, you know, literally almost in real time, so they're able to close the gap on performance more quickly, which I think is, you know, you know, part of the overall trend that we, the industry is shifting to is, you know, trying to get that information, more real time so you can react and make improvements or take advantage of opportunities, more quickly. When we talk about tracking assets, one of the things that, you know, I know is that, you know, frequently finding things on a site can be a challenge and so there's benefits just with the location awareness of equipment on the site as an example. But there's another trend that, you know, we're hearing as well which is around

requirements around sustainability for construction. Is there a sustainability dimension here.?

22.43 Anand: Oh yes, definitely. So we have started incorporating sustainability metrics and Connected Construction. We have started off showing our presenting the CO2 emissions on a construction site. So based on the number of rolling equipments you have or any equipment that is using fossil fuel, we are able to show our construction leadership, what's the carbon emission. So it's not only the by tracking a piece of equipment, I'm not only telling them the utilization, and the allocation, but I'm also showing them by creating synergy and offloading these pieces, these rolling pieces of equipment from a site, they are actually improving on their sustainability metrics, we are as we speak here we are incorporating fossil fuel usage on a construction site metrics greenhouse gas emission land usage, sustainable material and water usage metrics on the construction site. So we are going in the direction and we should, we should, we should have all those things incorporated within Connected Construction to help our construction teams to obtain their, gain their, to reach their sustainability goals.

23.48 Andy: So thanks Anand because I think sustainability is emerging as a more important area for our clients. We know both on the owner side and in the construction contractor community. And safety is always a concern so those the you know those two benefits are clearly of interest to our clients, as well as project cost, project schedule and the operability of the project. So it's clear to me that this type of capability, really influences decision making by having information flow more quickly to people who need it on the project when they need it. How do we see clients getting started to access these benefits?

24.32 Anand: In terms of the way clients have started, we have clients who have started with a single module, you know, as I said, the utility company they started off with safety module and then now they are moving into the field installation work package, and then they want to move into tracking people, material equipment on site. So, it is Connected Construction platform is very flexible, you can go module by module, and then we have clients who have taken the entire Connected Construction on a single project, they have seen how they are getting value out of it and then they have taken the same thing, and then deployed it across their portfolio and as I was talking previously, they are not only not only able to get lessons learned out of a single project, but using it on multiple projects they were able to bring in, you know, the lessons learned and the value added program or a portfolio level.

25.22 Andy: Thanks Anand, it's clear that you're very passionate about the construction industry, and how we can apply technology and innovation to drive improvement. Well this has been a short debrief on some of the exciting innovation we're applying here at Accenture, combining technology and human ingenuity to drive 360 degree value for engineering and construction clients. To help you find out more, we have links to our latest Accenture research on how to build value with Capital Projects, as well as a short explainer video showing how Connected Construction can bring value to your projects. I'm Andy Webster and I thank both you and Anand for your time and interest today.