Interview with Andreas from Nemetschek on Digital Twins, Sustainability, and Technology | Transcript

Introduction

Welcome to Green Building Matters, the original and most popular podcast focused on the green building movement. Your host is Charlie Cichetti, one of the most credentialed experts in the green building industry and one of the few to be honored as a LEED fellow. Each week Charlie welcomes a green building professional from around the globe to share their war stories, career advice and unique insight into how sustainability is shaping the built environment.

Interview

Charlie: Hi everybody. Welcome to the next episode of the Green Building Matters podcast. Once a week I interview a building professional somewhere in the world. For years it's been sustainability and green buildings. It still is, but more and more technology. I think our guest today will help us further connect how technology helps us with green buildings and sustainability. I have Andreas with us from the Nemetschek team. He's based in Berlin. Can't wait to talk about digital twins, sustainability, and circular economy. Andreas, how are you doing today?

Andreas: Hey Charlie. I'm glad to be here. I'm feeling good. Just came back from a conference in Paris and now I can rest a bit.

Charlie: Conferences are so important. We're like-minded people getting together for connections and the latest innovation in a post-pandemic world. We've got to go see people and collaborate. Help our podcast listeners, Andreas, take us back. Where did you grow up and tell us a little bit about your university days.

Andreas: I was born and raised in Germany, in Berlin, and studied here, I worked here and I'm still living here. It's a great city. No reason to leave. In school I was already very active in the student council. After school, at first

I didn't work with buildings or technology. I worked for the local government to build up something like a youth parliament in my district. Later I got the chance to work for the Federal Ministry to advise and connect youth initiatives in Germany. Then after I was a bit too old for this work, I discovered technology.

Charlie: So that was your background, your basis. Born and raised there in that part of Germany. Berlin is such an amazing and beautiful city too, with a lot of sustainability. This is the Green Building Matters podcast. In a minute we're going to talk lots about technology, but green buildings. When did you first start hearing about green buildings? What did that mean when you first heard it?

Andreas: Sustainability was always an important topic for me. I was connecting and advising these brilliant young people throughout Germany who are working on great initiatives. Besides advocating for youth issues, many of these initiatives also fought for sustainability. That was very impressive to me. Then afterwards, when I started as a software developer and worked for a startup creating solutions for building information modeling, I learned that buildings can also be green. This was definitely a great connection from my previous work in society and my current work in technology for buildings.

Charlie: Wonderful. I'm here in the US, we have programs like LEED, of course there in Europe, but there's so many other good programs. It's not always about getting that plaque. We've got good frameworks to use. But I think there's been a shift. It's more about decarbonization, more about just some of the overall mandates where you are in Europe and how can we comply and maybe how can we put that into our technology too. As we look at your career as you're connecting things and you eventually get into technology, did you have any mentors along the way? Sometimes a mentor is someone you read their material, you see them on stage, sometimes it's someone that has lunch with you and pushes you or opens a door. Have you had any mentors?

Andreas: I wouldn't say I had one mentor. Of course, there are always people that are impressive. But to be honest, I think I was missing someone like a mentor. That's why I always were keen to be a mentor to others, to influence other people and to give them a helping hand.

Charlie: That's amazing. You can learn a lot by just helping and teaching others too. It sounds like you are a mentor for others. So let's talk a little bit about the technology career. I see on your profile you've worked at a few different great technology companies. Of course we'll talk about what you're doing at Nemetschek in just a minute. But when did you first get into technology? What were you working on? Obviously you were exposed to BIM.

Andreas: As I mentioned already, I searched for a job in technology, started as a software developer in a small startup and never had to do anything with construction or buildings before. But then I started to work there and we were building plugins for design software to attach information to 3D models to analyze them, to use them for building information modeling. It's great work. It's always great to see that you are developing software for something which is actually built in the real environment afterwards. I started as a software developer, then became product manager and then product marketing manager. I built up this product marketing department for this company and then I left because I was hired by an American company called Procore.

I am sure many of your listeners will know this company. I was responsible for bringing Procore to the German market. Then one year ago I joined Nemetschek for bringing their new digital twin solution to the global market.

Charlie: So that's when you get into technology. BIM, Procore, of course, great dose of all things construction. Arguably the most successful construction tech company in the last 10 years, especially going through their growth in IPO. It's great that you were a part of that team too. Okay, so one more look back and then we'll talk about the digital plan project.

What are some of your proudest achievements? What's on the highlight reel, Andreas?

Andreas: Building up these youth organizations I mentioned in the beginning is definitely a great achievement because it shaped me. I think I had an influence on the life of some young people. Also bringing software solutions or Procore to a new market is great. But one more achievement is writing together with a colleague a short book. I did this I think three years ago and it was a short book for the German chapter Building Smart about BIM and circular economy.

Charlie: They say everybody's got a book in them. You've already done it. We'll have to put a link if that's available online for our listeners.

Andreas: Unfortunately only in German.

Charlie: That's okay, we have some German audiences that might need to translate. That's fantastic though. Okay, so let's talk about the present day. Tell us what your role at Nemetschek is. And I know you're working on this very special digital twin project.

Andreas: Nemetschek. I'm also sure a lot of you listeners know Nemetschek. Nemetschek is a global software company for the whole lifecycle of the building. Software solutions for the early design phase like Archicad or Vectorworks are part of Nemetschek. Building management construction management solutions like Bluebeam for example or GoCanvas are part of Nemetschek. And also software solutions for the operating phase like Spacewell. What was somehow missing is the link between all these solutions and the solution for the whole lifecycle of the building. So two years ago Nemetschek worked on this digital twin solution to create a solution for the whole lifecycle of the building, especially for leveraging all this great data which is built up during the design construction phase, for the operation phase.

Now I'm here for a bit more than one year and I'm responsible for bringing this to the market. So for marketing and go to market activities.

Charlie: That's an amazing responsibility. Let's help our listeners with digital twins. The concept's been around a long time. I believe it first started back even with maybe it was Boeing and airplanes and kind of building in a digital way first and then running simulations. But fast forward to buildings, the built environment. I know some developers unfortunately don't trust the architect's data. Maybe coming out of a great BIM tool, maybe one of your Nemetschek tools. And then there's the construction team that sometimes does like an as-built digital twin. So we've got to bridge that gap. There's a little bit of trust that's missing. So could you help us understand the difference between like a digital twin or maybe a virtual twin where we run simulations? What do we need to know?

Andreas: As you said is totally right there. Different kinds of digital twins and different views on digital twins. You also mentioned it as a concept which is used in other industries like cars or car manufacturing for several years now, but quite new for buildings. So we know what a 3D model, a BIM model is. That's I would say visualization. Static visualization of a building already attached, linked with some data. I would call it a static twin or detail twin. It's great for designing and construction but it's not really usable or it's not enough for the operation phase.

Now what we need there is the real as-built model, also called as-built twin, but not only so we can take a look at it and see what information is inside that we can really use to run this building. So updated with real time data, for example from IoT sensors. So we are not only having the visualization and some static information, but really real time information about the performance, about the status of the building. And then there are other ways to improve this digital twin, like a responsive twin that reflects the responsive action of the physical twin or an adaptive or virtual twin where you can simulate scenarios automatically or semi automatically. So these are different stages of digital twins and I think we got really far already. Maybe the outlook or what could be in the future, it's a really intelligent digital twin which makes decisions fully autonomous. But we aren't there yet.

Charlie: But that's where we could go. That almost predictive maintenance and we don't even have to call it machine learning and AI, even though it has parts of it. So that's a very powerful tool you've described. Is there anywhere in the world that they're really doing this? And what's it going to take for everyone involved from designing, building and later operating a building to trust the digital?

Andreas: So digital twins are building systems. There are already plenty of digital twins of buildings. Of course it's starting. Maybe comparing to BIM, I would say 12 years ago. So pilot projects, but also projects, buildings beyond the pilot phase that are really having this digital twin updated with real-time data, using digital twins to monitor buildings and really to gain efficiency in monitoring buildings. So this is really in use already that our solution called D-Twin or there are also other solutions on the market. And I think it's also important that digital twins are connecting these fragmented phases of the building industry. Because you mentioned that there is a gap between construction and design phase and operations and. You mentioned trust. Sometimes there is no real trust.

It's like you are starting when you're operating a building, you're starting again from scratch, which is not necessary because in design and construction phase already great work has been done, but it's not really used in the operation phase. So there's a gap. And I think digital twins are a great tool for bridging this gap.

Charlie: Thank you, that's fantastic. So what inputs do you need with the software you're building in house at Nemetschek? Do you pull in from BIM files? Do you ever go after the building's been built and do a reality capture? What inputs are you looking for?

Andreas: There are different opportunities and I think this really a key in acceptance of this technology. It doesn't make sense to say you need a BIM model to build up a digital twin because maybe for new projects you have already BIM models, but not for buildings who are existing since 50, 60, 70 or more years. And also it's not very user friendly. So I think the key is, and that is the philosophy of our solution is to use every technology, make every

technology usable and every kind of data usable. Which exists. So you can start with the BIM model, you can start with point clouds from laser scanning, you can start with photogrammetry or even 2D drawings. And then the next thing is you have to be able to connect the data sources you already have. Because everyone has solutions which already provide a lot of data, but most of them are isolated. It doesn't make sense to say, hey, we have a digital twin platform and now you have to use only this platform for creating data from your building. So it's important to have an open platform which connects all the sources and all the data you already have.

Charlie: It sounds like you really are using the best worlds where you can pull in BIM data. The example I use, we can click on a light and see the model number and how many of that light are in the whole building. We've got that metadata from the BIM files. That's valuable, but it might be a little minecrafty. So then sometimes if you can overlay that photogrammetry or even some point cloud, then you're getting the distances and the actual what did we install? But you might need to re-overlay the OEM manual or other data. But it sounds like you're really tackling both. I can't wait to see more of what you're building. So help us understand, Andreas. How can technology like that maybe help with sustainability and green buildings? I know you're also an expert at circular economy materials for one, but There's also the energy efficiency side of it. Help us connect those two places.

Andreas: I think digital twins can have a really big impact on the sustainability of a building becoming a green building. For example, Digital twins enable real time monitoring of energy consumption, but they can also simulate energy consumption of the future. They can simulate when I'm changing something here, when I'm optimizing something here. How does this affect energy usage? So energy efficiency optimization of energy usage is really a core use case for digital twins. Also, you mentioned predictive maintenance. With digital twins, you can really predict when maintenance is needed and prevent unnecessary repairs. And also extending the lifespan of building systems. And also decarbonization. Achieving decarbonization goals can be more easy with digital twins by tracking emissions and

optimize simulations and predictions the emissions of your building operations.

Charlie: Understood. Thank you for connecting all that. And that's a really good kind of segue to what's next. I like to ask my podcast guests. Andreas. What are you reading up on what's next in technology? Maybe the sustainability side of the built environment. What are you excited about?

Andreas: I think when speaking about technology today, nowadays we always speak also about AI and I think we know the great possibilities of AI. But more important, not only we as tech experts see these possibilities, I think Everyone sees that AI is changing, and can change every industry. And when we're speaking about BIM, for example. So many great things are coming with BIM. But to make this, make someone who's not a tech expert to realize this, it's hard. It's way harder than to explain to someone that AI can really change his business. So my prognosis and also my hope is that the incredible possibilities of AI, which are really obvious to everyone, are accelerating the digitization of buildings, of the building industry. And then it comes to at the same time also accelerating the sustainability of buildings. Because when we are speaking about AI, that needs a lot of connected data and this data can be. So digital twins are connecting all this data. And I spoke about the benefits from digital twins for sustainability. I think with AI comes more digitization, more connection of data and then the way is set for more sustainability and greener buildings.

Charlie: I love that. And just to our listeners you've got to be focusing in right now on not just operating carbon, how energy efficient your building is, but don't forget your embodied carbon, those materials. And with our technology and I think, Andreas, some you're building and some unbuilding, we want to give that feedback earlier to the designers. We don't want the design to be done and we run a model and it's like, okay, here's what you got instead. How can you get earlier sustainability feedback and modeling while you're designing a building? And I think that's something it sounds like we're both working on. Anything else to add on just the tech or sustainability trend front?

Andreas: I think what you mentioned here is also very important. So with new technology, you can really test different scenarios much easier than you can do it, you could do it in the past. And that also helps you to optimize the design of a building regarding sustainability. And the other thing is that's what I wrote in the book I wrote with my colleague is circular economy. I think it's obvious to everyone reusing elements, reusing materials of buildings makes much more sense than throwing it away, creating waste. But it's hard to find a solution for. Okay, Here I'm dismantling a building or I'm changing this building and here are some doors, windows or elements I could possibly reuse. But where to find the project? We could reuse it.

I don't want to store it for years until I can use it in my own projects. But when we are not only thinking about a single building, but build all the buildings and find a way to connect all this data. Digital twins we are building information modeling. Then can we really come to reality to reduce all this waste construction of the building industry is causing and make it usable in new projects.

Charlie: Oh, you're so right. And I know you love technology, you love sustainability to our listeners, don't be afraid of this technology. AI, if you're not currently using even a simple ChatGPT or Dall-E or some of the others Grok or just you need to set the bar low, start using these because this train will not stop. And Andreas, I'm sure you'd probably agree that machine learning and AI is just - we actually have a lot of data from our previous building designs and how can we maybe use that? That's our thesis at Schema for example. But I think in our day to day lives we've got to be using and be more comfortable with AI. Any final thoughts on AI and then we'll go to our rapid fire part of the interview.

Andreas: One important - we spoke about the great possibilities of AI. But one aspect which we shouldn't forget is the ethical questions of AI. I know it's especially for us enthusiasts always a bit disturbing but we know all the work we are doing and great architects are doing, great construction companies are doing and when we are speaking about AI we shouldn't forget the ethical aspects and that we are acting responsible and this also

means that we are acknowledging the work people have done. AI can learn from this. And that's the thing which is really important for my company, the Nemetschek Group. So we are working on great AI projects but we always take care about the ethical side of AI.

Charlie: So important. And there's even companies that help unlearn. If your model, if your large language model has some bias, maybe it's putting out an energy inefficient building. How do we unlearn some of the models, let alone, just the other ethical side of it all? So you're so right. But it's going to help us. Okay, so let's get to know you a little more. This is kind of the rapid fire part of our interview. I'm really enjoying this, Andreas. So what would you say is your specialty or gift?

Andreas: So I think my specialty is to start and to shape things. So let it be project solutions or departments or markets. Often I was the first one or one of the first to build something up from scratch or an early phase. So, starting something new, shaping this. I think this is my specialty.

Charlie: That's brilliant. Thank you. So do you have any good habits or routines that help you stay productive?

Andreas: I don't know if it's really a routine, but it's something really hard to learn but helps me to be successful. To do good work is not to work the whole time to disconnect, even if some things are still to do, but to disconnect to spend time with family or alone. And then when I'm starting next day or After a few hours, things are often getting easier than before.

Charlie: Yes. I find it's important to get things out of your head, even if you write them down or use a digital note, just because it physically takes up headspace. And mental energy. And then trust your systems. You can get back to it and kind of visualize that next day or the next week. And you I just got to do it. Otherwise there's so much noise coming at us. So I'm a fan of the bucket list. Not everybody has a bucket list, but you've already I wrote a book. That's amazing. Maybe some adventure, some travel. I don't know. What are a couple things on your bucket list?

Andreas: So recently I ran two half marathons. One in Paris, one in Berlin. And These two half marathons are already one marathon. But I think I hope to run a full marathon one day. So this is definitely on my bucket list. And you mentioned the book. I really want to write a second book. Maybe even this time a novel.

Charlie: That is fantastic. First, congrats on those distances. I admire that very much. And Paris, that must have been a great venue. Was it through the city? Did they close down some streets?

Andreas: Through the city, it was really great to run through Paris, across Notre Dame, also in Berlin, running through the Brandenburg Gate.

Charlie: All right. I can visualize that. So congratulations as you work towards the even longer distance and a novel. I just love that you're writing, if I may. I've not written a book yet. Some have told me I should. But do you find you need to have a special place that you write. Do you use pen and paper? Do you type? Can you give those that one day want to write, maybe a technical book, maybe a novel? Any advice to someone that might want to write one day?

Andreas: I'm typing. Not using pen and paper. Only pen and paper for ideas in the night or somewhere else. And I think most important too, is to give yourself time for it and to. Because it's nothing you can do in between.

Charlie: Thank you for sharing. Is there a book or even like a documentary you'd recommend to our listeners? It doesn't have to be about buildings. We'd just love to give a tip. Hey, you might want to check this out.

Andreas: I'm reading a lot, mostly on my business trips in the train or on the plane. But one book I recently read, it's already two years old. It's called Blue Skies by T.C. Boyle. It's a novel, and it's an impressive novel about how our life will shift because of climate change.

Charlie: Okay. I know we need that preview on what it could be, good or bad, and does it motivate us. Now I'll put a link to that book as well. Thank you. Thank you for sharing. Two more questions as we wind down. This has

been fantastic. As you look back on your career, Andreas, is there any career advice you wish you'd have learned earlier?

Andreas: I think the most important advice I wish I had earlier, or maybe that I should have listened to earlier, is not to try to achieve everything and to do everything perfectly, but to focus and also be happy with a bit less than perfect result. I think that's when you always want to do everything perfectly and to achieve everything possible, that's too much. So focusing and be happier with a bit less than perfect is I think that's really important.

Charlie: There you go. Wisdom. That's some good wisdom. Okay, last thing. Let's say someone's listening to the podcast now. They're getting real excited about your journey. How you got into not just sustainability, but of course, technology. You've worked with these great companies. I love your outlook, too, on just technology, circular economy, AI. It's positive with some caution, and I respect that. So let's say someone's listening and they're just now jumping in to what you and I are doing. Any words of encouragement if someone is just jumping in now?

Andreas: So even if maybe it seems a bit that sustainability is a bit slipped out of the public eye or even that sustainability is facing some headwinds, I think it's the same as in Germany, as in the US. There are definitely some headwinds saying, hey, maybe it's not so important as we thought anymore, but I think it's absolutely necessary to fight for sustainability for us, but especially for our children and grandchildren. And buildings are one of the areas where you can make the biggest difference in shaping a sustainable future.

Charlie: Inspiring and spot on. Well, to our listeners, if you're ever around Berlin, make sure you look up Andreas. Please connect with him on LinkedIn and just follow this great work that he and his team at Nemetschek are doing in and around digital twins. It's just, it's needed, it's necessary. Please trust this design data, trust the reality capture data. It's how we really need to be not just designing, building, but operating our buildings and it can net out to better sustainability. So Andreas, thank you so much for telling us your story. Congratulations on your successes and I

look forward to collaborating with you between Schema and Nemetschek. Thank you sir.

Andreas: Thanks for having me, Charlie. And looking forward to it too.

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