TRANSCRIPT

Rakshith Venugopal (ESCA Student Ambassador) interview with **Nikhil Palekar** (Project and Program Manager, Europe, NXP Semiconductors)

13 June 2025

Rakshith Venugopal: Hello, I am Rakshith Venugopal, a first year PhD student from the Dutsches Elektronen-Synchrotron in Hamburg. Today we have with us here, Nikhil Palekar, project and program manager of Europe from NXP Semiconductors. Thank you very much for accepting the invitation for this interview and for your time. Let's get started.

Nikhil Palekar: Thank you, Rakshith.

Rakshith Venugopal: Yeah. Ok, so for my first question, could you tell us a bit about your role at NXP and what a typical day of yours looks like?

Nikhil Palekar: So, at NXP I work for the Hardware Solutions Competency Center organization, which is responsible for building ATE test equipment. So that's automated test equipment for the internal business line partners that are responsible for building chips, end products and the systems that NXP commercializes with other client companies. My organization mainly builds the wafer level test and final test hardware, which is required for verification of these chips or the wafers that are produced by NXP. This is a step which almost, every semiconductor company has to follow because this enables them to ensure that they are only releasing quality products out in the market. So the ultimate goal for them is to verify that each chip behaves the same way as the specifications are, and it shouldn't lead to any issues once it's been put to use, that's in short, what my team does and for me personally, a typical day involves switching between meetings, following up on status updates with the engineers who work on designing these protocols, and ultimately, the main goal for me is to have a clear and efficient communication between all the stakeholders that are involved, right from the internal business line partners, our team and the turnkey suppliers who build the hardware for us.

Rakshith Venugopal: Right. That seems really interesting. So, how did you get into this field and what led you to work in this department?

Nikhil Palekar: I would speak a little on how I started getting into the semiconductor field. During my last year of bachelor's in 2018 or so, back when I was in Manipal University, Jaipur, I had the opportunity, or I was selected by a PhD Scholar back then to work as an associate with him on a research topic, which was on a microfluidic device, a sensor that we built and during my period of work with him, I developed quite some skills in COMSOL simulations, which later on enabled me to get an internship opportunity at Texas Instruments, when I was in Germany doing my master's. This internship was really fascinating because it at the end got converted into my thesis

project and, the project was mainly that we built a wafer prober, so, a wafer tester is called a wafer prober, and this generally out in the market, in other companies these probers are to be used for dry testing so basically just to get out the electrical specification or parameters of a particular chip or a device of them. But what we built was something really revolutionary. So, we set up the prober in such a way that it would deliver small amounts of fluidic pH buffers right on top of the wafer surface without causing any shorts or damage to the device under test. And this was completely automated and that's how I was introduced to the word of probers and testers, final testing equipment, wafer test equipment. After my thesis, fortunately, there was an opening at NXP which completely aligned with what my thesis project was. But, the only catch was that it was a project management position and not a technical position, which was fine for me because getting into the field of program manager was also had a personal side to it because my father started his journey, his career in/through project management. So, that's what motivated me to get into this field and so far, I'm enjoying it

Rakshith Venugopal: That's really interesting. That's really interesting for me to hear about your journey. OK, so moving on to another question. So, when a chip passes through the test equipment, you help deliver, how close is it to end up in something like a smartphone or an electric vehicle?

Nikhil Palekar: That's a good question, Rakshith, so when a chip is fabricated and this is released for testing, they are right at the end of the quality cycle, so the testers are enabled to verify these chips, and as I said that they should behave as expected and should not have any glitches or any issues which may come due to all kinds of reasons. As you know, semiconductor devices are highly sensitive to ESD damage or some debris from atmosphere which could reach in and create a short which ultimately when, released to an end product may lead to life threatening issues. So, right after the testing is completed, these chips that are; let's go from the wafer level test. So, at the wafer level, each die or some of the dies will be verified to check if the manufacturing recipe was intact and there are no issues across the wafers. And, after this there is a packaging procedure, packaging procedures are more expensive than the testing equipment or the testing procedure itself. And, if you were to not do the wafer test and release it directly for packaging this could lead to the bad devices getting packaged, and this can cost the company a lot. So that's why the wafer test is very important and followed, and to ensure that even the packaging procedure was correct, the final test comes into play, which is done after the packaging. So once this is complete, we deliver the devices to the end customer which can be an automotive company or a smartphone company which directly installs such a chip in the smartphone, and you get it as an end product.

Rakshith Venugopal: I see. So with this automated test equipment, do you test the dies till failure or is it a type of stress test you do? Or is it a preliminary test to just check as you said, if everything's working properly or?

Nikhil Palekar: It completely depends on the device itself for example the projects I handle are mostly in market segments of automotive radar sensing so sensors, then there is secure ID products which are used in banking cards and also if you know NFC is also a product of NXP and this is also if it's a microelectromechanical device that has to go through a stress test and other

mechanical forces. But in our case we don't do that. The main procedure for us to ensure, that the main parameter we are interested in like the electrical specifications are met and if you take a look at any IC and its data sheet then you'll find a lot of information about stress test, mechanical tests, electrical tests. So us being a core semiconductor company for us, it's important to know that our procedures have not been hampered in any way, so only the electrical parameters are ensured that they are working correctly and once this is complete, the devices are handed over to the end customer and they can build on it with other mechanics and then it's up to them to take the test forward.

Rakshith Venugopal: I see, that's really interesting. Thank you, Nikhil. So when you complete a project, what does success look like for you?

Nikhil Palekar: OK. So, whenever a project is completed, I make it a point to make a list of what things went wrong? What things went right? And ultimately, for me, success is basically we need to evolve, right? So we need to ensure that the past lessons learned are implemented correctly and there were no surprises that came into play, during the life cycle of that project. Moreover, for a project manager, the most important thing is that the, we call it the Holy Trinity, that's the product needs to be delivered on time. it should be in the budget and should have the utmost quality. But apart from that, for me personally, if all the stakeholders or the people involved in a particular project are aligned together and on the same page and there are no miscommunications happening, then for me it's a successful project. And that's how I define it.

Rakshith Venugopal: Well said, Nikhil. Thank you. So I would like to get into what kind of technical backgrounds would be most useful in a role like yours, and do you think someone needs, a person needs really deep engineering expertise to succeed in this type of project leadership role?

Nikhil Palekar: I would say, so for me personally up until the time I got the opportunity to get into project management I did not look at any other or seeking expertise in any other domain. So, my focus had always been on technical and that's why my experience up until NXP was completely technical. But I would say to the next generation coming up, I would say it's really important that you focus on the core technicalities as well because, that enables you to understand what happens at the factory level or at the at the core of every semiconductor company, let's say. And being said that, it's also important that you also get an understanding of how these, how multiple fields come into play, so hardware, software and material sciences, physics, for example. Everything. So the semiconductor industry is not does not work in solos. It's an interdisciplinary field. And being said that you can never, never lose focus of the other stuff, right? Like the soft skills. So improving your soft skills, presentation skills. These things together, I think really build you for a role in leadership. So for me, even though on a day-to-day basis. I don't have to use my core technical knowledge. We have experts for that, but still it really helps that you are able to understand the problems or things that go right and you are able to communicate this correctly to the stakeholders who are involved with this project.
So yeah.

Rakshith Venugopal: Soft skills combined with hard engineering expertise would make a deadly combination.

Nikhil Palekar: Absolutely!

Rakshith Venugopal: All right. So moving on to the next question. This one I would like to ask would be how would you describe the current state of the semiconductor industry in Europe and what do you see as Europe's strengths and challenges in competing globally, especially with countries like the USA or with Asia as a whole?

Nikhil Palekar: OK, the way I see it, the semiconductor industry in Europe right now is in a mixed state. So on one hand there are strong strategic moments, momentums, driven by the EU government to boost, the target, was to double its global chip market share by 2030. But on the other hand, the region is facing real challenges and keeping up pace with the with, let's say, the America's or Asia's, especially in high growth areas like AI and advanced logic manufacturing that's happening right now as you know. So, in the past year, so, the last quarter 24 and early 25, Europe experienced a significant market contraction, and this was largely due to post pandemic overstocking as we call it and weaker demands in key sectors like automotives. While global markets have rebounded mainly because of AI and the data center demands in the Americas and Asia. Europe is lagging behind because we the focus is mainly on automotive, electronics and power electronics, let's say. But that is also Europe's strength, the expertise in analog, power electronics and automotive grade silicon. So that's where they are really having quality products and reliable. That's why, there are many companies like NXP, STMicroelectronics and so on, that are working towards this and I would say this is a dynamic field. What we're facing now will be completely different in a two years timeline.So yeah, that's that's my take on the global market of semiconductors so far.

Rakshith Venugopal: Thank you. That's really insightful. Europe being leading in some places and lacking in others, you think that there's space to grow and space to keep ahead.

Nikhil Palekar: Exactly.

Rakshith Venugopal: Thank you. So, to the next generation of young people who wish to enter this field, what kind of advice would you give them?

Nikhil Palekar: My advice would be, be curious, be adaptable, and don't be afraid to get your hands dirty with real world projects. This industry is incredibly dynamic, it blends the technical knowledge with global collaboration and touches nearly every aspect of modern life. So from smartphones to electric vehicles, autonomous vehicles, and your secure IDs. I would say start by building a strong foundation in fields like electronics engineering, physics, computer science and so on, but also explore areas like system thinking, data analysis, material sciences, and also project management, because success in this field often comes from being able to connect the dots across disciplines. So ultimately I will say stay open to learning. The technology is fast and the best people in this field are the ones who never stop asking the right questions.

Rakshith Venugopal: Thank you. That's really insightful. Staying on this topic from your perspective as a project manager, what challenges do you see for women entering or advancing in the semiconductor industry? And do you think if the visibility of women in leadership or technical roles influence the career choice of younger students?

Nikhil Palekar: That's a good question, Rakshith NXP supports gender diversity and initiatives in developing female talent. But I would say there still seems to be a low number of female employees in such a highly technical industry and a company like NXP, I would say this is probably because many girls don't see or idolize a lot of women in such roles, which makes them have self doubts. But, this is definitely changing now, there are many or the new generation women coming up and taking on the technical roles, reaching leadership positions. By the time, for the next generation, females have someone to look up to. And I personally know many talented female employees who are excelling in that technical fields now also serving to be role models for the upcoming generation. So, for many women, I think it's important that they have a focus on the core competencies like the technological core fields. At the same time, the strengths, right? So, they should focus on also good communication and creative technical presentation skills which also tend to be growing their influence and impactful managerial positions in NXP.

Rakshith Venugopal: Thank you. So if you want to add something to that, for example if you are speaking to a young woman right now studying physics or engineering or management, what more could you say to encourage her to consider a career in the sector?

Nikhil Palekar: Yeah, I would say no matter how boring it gets, focus on the technical part. Because, once you put your feet out there in the market and the industries, then you will know where such information is put into use and how things/ multiple things come into play and build a a beautiful product like a smartphone for example, and yeah. So, I would say they should focus on also the recent technologies around us, they gather all the information that you can, and focus on problem solving skills and have an innovational mindset. So, basically this field not only gives a very fast learning platform, but also inculcates, it should inculcate in all of us a sense of responsibility towards future technology, let's say.

Rakshith Venugopal: Thank you. So for students, are there any initiatives between NXP and other universities and are thesis opportunities and internships covered by NXP?

Nikhil Palekar: Yeah. So about that, I wouldn't say there's an official initiative as such, which has a name, that NXP has tie ups with other universities, but they do have a lots of or NXP take participates in lots of job fairs across universities. I personally know a few friends who have attended every year at TUHH for fairs. And, we have many students working at NXP on several thesis projects. So yeah, that keeps happening. So, I would say keep applying to NXP and you would definitely get a really good thesis opportunity eventually.

Rakshith Venugopal: Thank you. I'm pretty sure many students would listen to this interview

would love to apply to NXP, and for my last question, how do you think academia can better prepare students for entry into the semiconductor industry?

Nikhil Palekar: So, speaking from experience, I would say there are three points that come to my mind. So first, there's a need for more hands on application oriented learning. At the university level, what we learn is theoretical and it's really difficult for us to imagine how many of the principles or things that we that we just answer in our exams come into play in the real world. The semiconductor industry is very practical, so students really need to take benefits from the real world problems and that's why I would say taking up internship opportunities, something from several industry based companies should really help build on that. My own thesis experience at Texas Instruments really prepared me for for the job role that I am currently working on. And yeah, so secondly, interdisciplinary training is key. The industry doesn't operate in silos. Understanding how hardware, software, all of these fields come together is incredibly valuable. Academy can support this by offering more cross functional courses and encouraging collaboration across departments, which you do have in most German universities, as I see. Then thirdly, I would say the focus on your soft skills that's going to develop you as a leader and or later on in your life, to when you get into feels like project management, communication and teamwork is key. Yeah, it's not only the technical knowledge, that's important, but also soft skills. And yeah, so finally, the stronger industry academia partnerships are highly essential, I would say. Guest lectures, mentorship programs and codeveloped coursework can help bridge the gap between learning, theory, and practice and that should be the main goal to bridge the gap between theory and practice. So yeah.

Rakshith Venugopal: Thank you very much, Nikhil. That was really wonderful interview. Thank you so much for your time. I'm really positive that this interview will have a great insight into the industry and will inspire many students and talents. Thank you very much again.

Nikhil Palekar: Thank you so much.

Rakshith Venugopal: And have a great day, Nikhil.

Nikhil Palekar: You too. Thanks.