Oral History of Jean-Luc Pelissier

Interviewed by:
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Sridhar Vajapey: So, for the recording, what is your name?

Jean-Luc Pelissier: My name is Jean-Luc Pelissier.

Vajapey: And what do you do today?

Pelissier: And I am the CEO of Universal Instruments out of upstate New York.

Vajapey: And before Universal, what were you involved in?

Pelissier: I spent my life in test, actually, after school. And started very early as I was doing my Ph.D. in IBM actually, involved in test and design validation.

Vajapey: OK.

Pelissier: Using and developing.

Vajapey: It's OK.

Media Crew: Go.

Vajapey: I am Sridhar Vajapey. I am today interviewing Jean-Luc Pelissier, who is the president and CEO of Universal Electronics [Universal Instruments Corp]. Welcome, Jean-Luc, on behalf of the Computer History Museum for today's recording.

Pelissier: Thank you, Sridhar. It's a pleasure to be here and to be interviewed by you. And I'm looking forward to spending the next few minutes with you, and talking to you about my story, and my experience.

Vajapey: Thank you very much. Truly appreciate it. So, tell us about your background, about where you come from, what you have done.

Pelissier: Obviously, I'm not born in Texas. I'm born in the south of France. And very early I had a passion for electronics. And that came going through and buying components for actually solving some problem at home with my father.

And I was immediately passionate. And I went and followed an engineering degree and schooling in France for electronic and microelectronics. And I had the opportunity to pursue with a PhD inside of IBM. And I was working in a test division in Compaq [???] in the laboratory of IBM in France, so seeing all components and all technology for the needs of IBM in Europe.

And I had the opportunity at that time to work with some of the best technology. And my charter was really to develop an electron beam tester that would be done and put together from bits and pieces: a microscope, and scanning electronic microscope, and some, you know, hardware that we were designing actually locally, and computing capability and image processing capability to actually build something that would, by comparing images between a good device and a bad device, would create a mapping of a failure and allow being an advance getter [??] and to really follow the failure through the cloaking system and the propagation of the fault inside of the device.

So, it was a great place and a great place to learn. And obviously it was design work that involved software and hardware. But I had in mind to be in the birthplace of electronics and really go to Silicon Valley.

So, as I was moving into IBM and actually contemplating moving into the sales force of IBM, Schlumberger came and offered me the opportunity to work on the very exact same technology that I had developed in IBM, but for commercial purposes. And that's at that point that I joined Schlumberger first in Paris to cover from a marketing point and marketing function the European territories. And quickly, they moved me to St. Etienne in France in a marketing position for our product line. And I finally ended up a year later in California to manage all the marketing of the component test division.

Vajapey: So after IBM, it seems like you were an engineer at IBM, and then quickly moved over to marketing. Was it the French aristocracy style that put you in marketing?

Pelissier: No. I think it was the grooming methodology, the development methodology of Schlumberger. In addition, it was a technology that was really fundamentally emerging at that time where only a few individuals in the world having worked on that technology. And Schlumberger proposed to me several positions actually covering that product, and gave me the opportunity to select the marketing position and become a marketing manager for that product in Europe.

And I had never done that. But remember, I told you that I wanted to move into the sales force of IBM. So, obviously that was an opportunity to move into a space which I absolutely didn't understand and didn't know, since, yes, for sure, I was a pure engineer, a pure [INAUDIBLE].

Vajapey: This was the IDS machine that you were trying to sell, the IDS 2000?

Pelissier: At that point. So, I joined Schlumberger to be the marketing manager for the IDS 5000 at that time in Europe, yes. [The machines were used for debugging and failure analysis of components.]

Vajapey: And that had some neat technology with it.

Pelissier: It was incredible. I mean, there was a group of innovations. The first innovation was why every SEM available in the world would move the sample under the column. The concept in the IDS 5000, the innovative concept, was to be able to power the device. The device would stay fixed inside the vacuum chamber. And we would move the column that was very compact, and optimize for voltage contrast and measurement. And the column would be moving on a stage under the device.

So, that was one breakthrough in itself. And moving to columns was obviously a challenge. Moving it with accuracy and repeatability to be able to do some imaging, to be able to drive the electron beam from a CAD system, and the association of the CAD system, and the mapping of the CAD system with the X/Y coordinate, if you want, of the beam and the column was the second innovation in the system.

The third innovation being the user interface itself, which was fundamentally removing absolutely all of the knobs that you traditionally were seeing on the SEM [Scanning Electron Microscope], a traditional SEM, by having something that was totally transparent. And the goal of the product was really to put in the hand of the designer, not a laboratory Ph.D. expert, that powerful system that we really focus on design and design validation, rather than focusing on how do you tune the microscope to be able to make measurement or make voltage contrast images from the device.

Vajapey: So, you basically had three fundamentally new technologies going to this machine. Quite complex.

Pelissier: Between others, yes, they were. I mean, the integration of the CAD together with the column and the mapping of the column, the capability to move the column, and keeping the device stable to be able to sizing and.

Vajapey: So, as part of marketing, I assume you took a wider role beyond this machine to sell the test equipment as well that Schlumberger inherited from Fairchild?

Pelissier: So, we actually were a small group of people that started together in the same time to market that product in Europe. And in Europe, we had as competitors Siemens and Leadtek in the UK. We rapidly gained a predominant market share in Europe.

And Schlumberger, who likes to move its personnel quite often in-between function and location, asked me to move to St. Etienne and start to be responsible for a new generation of test equipment that we were launching at that time, which was called the ITS9000MX. So, that was a 40 megahertz version of the ITS9000 family [used to test semiconductor chips] that was developed in St. Etienne. And the team asked me to move down to St. Etienne and take the marketing function for that product.

Vajapey: Was the ITS the first move away from Sentry, the Sentry line of products?

Pelissier: Yes. So after the Sentry 20, 21, the Sentry 50, there was a Sentry 15, which was manufactured and engineered in St. Etienne. That Sentry 15 became S15 when the name of the organization changed. And at that time, the products were named S with a number behind depending on the frequency and its performance range.

And parallel, we were in the process of developing the first family member of the ITS9000. And they were two products. One was an ITS9000FX, which was a 100 megahertz based and developed in the US, in San Jose on Technology Drive. And the other was the ITS9000MX, which was developed in St. Etienne.

The difference between the two was that the heart of the system, the sequence of pins, which was another innovative technology, the first, obviously, iteration of that technology. The heart of that sequencing of vectors per pin would be implemented in CMOS technology for the first time for the 40 megahertz version of the tester, while the 100 megahertz version of the tester would be actually developed in gallium arsenide, first bipolar technology obviously all of the pin electronic and technology touching the component itself. But the heart of the machine was actually initially in bipolar technology. And as we moved the performance of the ITS family, moved in gallium arsenide.

Vajapey: So, can you talk a little bit. Sentry and Schlumberger, when I started my work, and started testing microprocessors, the TMS7000 line of controllers, the TMS320, 32 and 16 microprocessors, Sentry [testers] filled our [production] flow. Can you talk a little bit about what happened to that roadmap, and what forced the transition to the ITS line? Was this a major step function change? What happened?

Pelissier: Yes. It was a major step function. You have to realize even so, maybe it could be called a veteran today. The Sentry 20, and 21, and the Sentry 50 were really the beginning of my career, right. So from a timing perspective, everything that was prior to that, and as well as the beginning of the Sentry 20 and 21, I was still in my crib. So, I've a limited either recollection, or just because I've heard stories from the people around us. A great person to interview to get all of that history would be Rudy Garcia, if you remember Rudy.

Vajapey: Yes.

Pelissier: I think he's still having absolutely all of that history, and would be a great interview for you all, for the Museum, actually. So, the Sentry 20 and the Sentry 21 were really the products that were selling at the time I joined Schlumberger from the test perspective, right, and prior to that. And those were products that were coming from the US, so from Technology Drive, right.

And prior, we had that organization in St. Etienne in France that had recently introduced the Sentry 15, which became the S15 and its successor, which was a mixed-signal tester on which analog test capabilities were bolted onto a digital tester, so probably the first tester, C tester, which was called the S1650, OK.

And at that point, we were starting seeing in the industry some testers with resource per pin, right. And I'm certainly not recollecting exactly the chronology. But I think a Megatest was certainly in that package. And probably ITX with the trainer machine were there also.

And therefore, we had really a major innovation, which was to take the concept of the tester per pin to its [INAUDIBLE] if you want. And the idea was can we sequence more than one vector, if you want, on the pin electronic. And that's where we came up with the concept of the sequence per pin, which would lower us to sequence a number of events on one, and driving one pin electronically, if you want.

And that really operated a complete break in the roadmap of our tester. And that's when we embarked from the Sentry 15 or 15 type of architecture onto the ITS9000. And the ITS9000, you know, was the ITS1000MX and FX at the beginning, and the evolution of all the FX into the IX, KX, EX, and it's probably not the right order, that successfully went from 100 megahertz, to 200 megahertz, to 400 megahertz, and to 800 megahertz.

Vajapey: The first ITS, the FX version and the MX versions, they were in the early '90s?

Pelissier: They were launched, if I remember well, I would guess in '91.

Vajapey: '91.

Pelissier: Yes.

Vajapey: That was a while back.

Pelissier: Yeah. And so they were the first tester that included the sequence of per pin which was a major innovation from pattern generation, not pattern generation, but from an event generation perspective, and allowed us to generate some very and extremely complex waveform at the pin electronic level, therefore getting more validity out of, you know, the test environment work right into the component.

The second thing that we had to introduce is there was so much power dissipation and so much energy in the test equipment, that we had to cool pretty much every single board with liquid. So, we embarked at the same time that the design of the electronic into successive generation of technology dedicated to cooling effectively the electronic that we had in the tester.

So, for the first time, the tester would be organized in cages. There would be control cages in which all of the pattern generation and the sequencing of the tester itself would be generated. And they would be the cages in which we would provide the pattern generation for every pin and the generation of the event sequences for everything. And then very high-speed cable that was another changing technology would take the signal from those cages, and pin slices we were calling them, and bring the signal to the pin electronic that were in a circular test site obviously outside of the frame in the mainframe itself.

Vajapey: So, again, there were a whole bunch of innovations that were required to take you to next generation. How do you, from a business perspective, balance the innovation piece versus risk? What all did Schlumberger, what all did you and your team consider when you were making decisions?

Pelissier: Well.

Vajapey: Was it concurrent engineering? Was it you had to choose from a number of?

Pelissier: Well, you see the ITS9000 architecture was dramatically different from what was existing before. So, that was a complete departure on the initial design and Initial concept. Even so, I was still in France at that time and working under diagnostic equipment was generated from the innovation brain of an incredible engineering team that we had in both San Jose and St. Etienne at that time, right.

And there are many names that I could remember and highlight here. But a very innovative set of people. But very quickly, kind of our claim to fame on one side and our way of working with customers, we really got engaged very deeply with customers I think very early on developing technology on the road map that was defined by a number of customers, if you want, right.

And now, we would define the test equipment by the preference that that group of customers would require at a given point of time to meet the needs of the technology node, right. And we would not necessarily balance the risk at that time from that perspective. But we would see what are the elements of technology that we need to really advance in order to be able to meet that technology node and to meet that particular performance requirements, right.

Vajapey: So, It was pretty much concurrent engineering. As you got the customer input, you knew their roadmaps. And you needed to ready your machines?

Pelissier: Yeah.

Vajapey: You looked at the technologies and concurrently started developing, right?

Pelissier: If you look at the ITS9000FX really in same time, you had a PA20 capable of delivering a signal at 100 megahertz, which, you know, bipolar--

Vajapey: At that time was very.

Pelissier: --high performance.

Vajapey: Right.

Pelissier: Pin electronics. You know, maybe four designers in the world can do or could do the design of that chip.

Vajapey: You could almost name those designers.

Pelissier: You can definitely name those designers with no doubt, and know which ones were better at, the one that were a follower and the one that were the most innovative. We would obviously all rush for the technology bed in which we would make them, so the foundry that would be willing to work for a relatively small volume of testers like we were, and to invest all of the development necessary to develop the simulation technology, and mature that bipolar technology to the level where we needed it in order to meet the performance point of the tester.

Then in parallel to that, we had to develop the technology of the sequencer itself. And the technology of the sequencer has always been on the absolute cutting edge of the semiconductor technology available, right. So, the first situation where, as I told you in bipolar, yielding the devices were an absolute challenge right from the beginning, probably a little bit similar to what you have been experiencing in your chips. So, it's an example. And we moved from bipolar technology to gallium arsenide technology, which was obviously another change--

Vajapey: It was still in its infancy phase at that time. And--

Pelissier: It was. It was in infancy.

Vajapey: --and the reliability factors were low?

Pelissier: And the reliability factors were low, which committed us to make very early on in the choice of the technology platform, if you want, in the design the requirement to move to liquid cooling, right. So, I think, and obviously I don't remember very well, but I think we were pretty much the first one to come up with liquid technology and liquid cooling technology for both our pin slides and our tester boards, which were the pin electronics. And maturing the technology, which we can think is a little bit more mechanical, yes, for sure, time and effort.

But finding the right coolant on the one side, right, that would not create problem in case of for leak or in case of an issue, and finding the right and designing the right valve that would allow us to pull that valve, put it back, pull it again, put it back was very, very challenging. And in term of elapsed time, I'm not sure it took us, it didn't take us more time to really find the right technology for something that could appear to be relatively simple like the valve in comparison to the integration lever and the complexity of the timing generator that was a sequencing of the pins themselves. So, there are some really good stories and a good anecdote about the concurrent design of obviously all of those technology hurdles.

Vajapey: So, when you shifted over to the IPX, IX testers with gallium arsenide, and liquid cooling, and possibly some other items as well, were there any that made you trip over? And if you did, how long did it take you to recover? Because recovering is part of a critical portion of business.

Pelissier: Well, I mean, I think like in many different places of the high technology, you come to a point where you are walking a little bit in the unpredictable, right. And again, pin electronics and timing generators have, for all of that generation of tester, been completely at the edge of the technology.

Vajapey: Right.

Pelissier: I mean, the technology node and the technology need was defining absolutely the performance of the tester, right. And our designer would take the situation and take the fundamental capability of that particular technology and, from that, put a stake in the ground in terms of saying the performance of the tester using that technology is going to be that much, right. And obviously it was always, you know--

Vajapey: Pushing the edge.

Pelissier: --pushing the edge, right. As a leader on the design point of view and depending on the quality of the design tool, the fluidity of the simulation, and the simulation tool, and the model that we were using at the transistor level, and at the sub-system level, or the sub-block level would be extremely important in us meeting reality or just creating a new problem.

Then behind that, those were, at that time, technology that were in the level of integration that we're looking at, extremely challenging in terms of defect density and therefore being able to yield those components. So, I remember a generation of testers where the testers would be ready with-- I'm talking about the prototype here or the number 2, yeah, or the prototype. And literally, receiving wafers with timing generators from, you know, our selected supplier that were working very, very hard to get us that technology, and maybe getting one good die, therefore 1 pin every 1 wafer or every 2 wafer, and struggling in terms of understanding if we would be able to really run the technology.

And a number of weeks would come by. And we would get pressure, obviously, from customers that were reaching their own technology node, needing the testers in volume quantity. And the pressure, and the rush, and the management, and the focus that we had to perform an engineering side to yield those components and be able to deliver the volume that was necessary to run the testers and the equipment in production were critical. At that time, that was really critical.

When we stopped doing that in, so, bipolar first and then gallium arsenide. And we finally reached a point where we could really do a high-performance timing generator and sequencer using CMOS technology. And again, we would push the technology to the absolute extreme edge of its envelope to the point where we would do a design, and then a redesign. And you know what happens between the design and another redesign. It's 14 weeks, which is the sacred time of your firm. So, there was, I think, a lot of pressure involved for, I would say, management and focus in the process of coming up with a solution --

Vajapey: As much as we used to laugh back then, 14-week cycle time, it is pretty much going to exceed 200-day cycle time as we move forward?

Pelissier: Yes.

Vajapey: So huge changes in semiconductor cycle time and so on. So in the case--

Pelissier: And the last technology change really has been FPGA, right.

Vajapey: Yeah.

Pelissier: And that's really when we saw that we could implement the technology and complete testers inside a really comfortable pin slice, if you want. And that's really when the concept of Sapphire came out, right. And the other change was not anymore in the timing generator. Even the timing generator we were trying to pack so much pin inside of the timing generator to maximize the number of channels per board that we ended up with the same problem or the same challenges, if you want, right.

But we enabled another set of real issues and challenges by trying to push the FPGA technology to deliver or being able to create the fast pattern generator that we are looking for with maximizing the size of the pipeline and so on on the tester. So a lot of challenges.

Vajapey: The team seems to be pushing the technology of every node?

Pelissier: The theme in that industry, interior design for testability and DFT technology came before has absolutely been pushing, pushing, pushing the technology to the absolute edge of what it could provide either from an integration perspective, or a combination of integration and performance perspective. And you either compromise to do between the number of channels that you pack onto one slice of the tester, versus its obviously absolute performance in speed and accuracy.

Accuracy, we didn't talk about accuracy yet. But accuracy was the element in which we could bring value to our customer at that very high end of the technology fringe, giving them the opportunity to themselves select out of the positional device, devices that were more or less fast, depending where they were in distribution of the process curve on their manufacturing.

Vajapey: So, it's funny, isn't it. The testers reached $8 million dollars now per tester at some point in time. And basically once DFT techniques picked up, the need for such complexity dropped. And my guess is that the cost of the tester now dropped. That would have posed a big business challenge for you, trying to keep the revenue growth. Can you talk about what the company went through when the price changes were so dramatic?

Pelissier: So they were, so--

Vajapey: This is still the Schlumberger time frame--

Pelissier: --yeah--

Vajapey: I would assume?

Pelissier: --it was the absolutely incredible--

Vajapey: Before it spun out to NP Test--

Pelissier: --it was just at the time of the spin off, right, that transition happened. And so we were on the path of the ITS9000 with its successful and subsequent iteration with more and more performance, better and better accuracy, when one of our customers asked us to do and to work with us to do a secure tester, right. So, the idea was obviously that the device to be tested would have a lot of functionality that would put the device into test configuration that the device itself would verify and really kind of deliver a signature and result of those own internal tests to the tester in order to verify the identify, and if the device has passed or not passed, the functionality that was required.

And there are a lot of different types of DFT switches. And therefore, there were all different types of requirements for the complexity of the analysis to be done by the tester, or the pattern generation to be generating, right. At that stage, we saw the beginning of a transition from a tester that was between $6 and $8 million dollars at the high end, and a tester that would come down in terms of cost, and where the challenge would be really integration in the number of pins down in the sub $1 million dollars or hundreds of thousands of dollars, if you want, period.

Now, the good thing is that that transition didn't happen really abruptly and overnight, right. Now, on another end, we, in parallel to that, came up with the Sapphire platform and concept where we were jumping from that pattern generation being done in custom logic to the pattern generation being gone by an FPGA and being able to reprogram the FPGA almost on the fly, or at least during the execution of the value sequence of the test program to be able to change the behavior of the pattern generator for its requirements, right.

And that, together with the migration from the gallium arsenide technology to the CMOS technology, both on the pin electronic and on the sequencing of pins if you want, and being able to pack that into slices of testers or the result of that, whereas the pattern generation would be really literally not done in the control mechanism and the control boards but literally on each of the pins. And all of those pins would be synchronized so as to go through a very ultra-precise part that could span the technology requirements from, you know, the gigahertz to the 15 megahertz or 20 megahertz involved in the application.

At that point, really the value proposition and the differentiation that we have seen in the product was going to drive the cost of high-end testers down by a factor of 2 to 4, and 4 to 6 on the low-end tester, together with the layering of functionality that you could integrate a lot more, like the DFT technology. So, we knew we were going to help the revenue base, right. And.

Vajapey: So, you needed the money somehow to continue to feed that massive engineering team?

Pelissier: We were, yes. Because, as you know, engineering a new generation tester is very--

Vajapey: Expensive.

Pelissier: --important point. And you are talking about it's in the hundreds of millions range over the year to develop all of the functionality and the capability, right. So, it was a challenge. And the bullet needed to be bitten, right. And.

Vajapey: This was also at the time Schlumberger had just spun off the test division if I'm--

Pelissier: It was at the time that the division had been spun off. And obviously, we were restructuring the business to be stand-alone, right. And it was, as a result, the ideal time to make a structural change inside of NPTest as a reason of all of those changes. So.

Vajapey: It was a perfect storm, actually, coming, or it was a perfect tornado, right--

Pelissier: Coming in at the right time.

Vajapey: But.

Pelissier: I mean, there was so much change that changing the revenue base at the same was going to be--

Vajapey: Hurtful.

Pelissier: --hurtful, but the right time to do it, because it was transformation, if you want, right. And that's what happened. And, as you know, somebody you know very well, Ashok Belani, really at that point, you know, I think we talked about it so many times, so many times. And we really made the decision that we were going to be full-blown on that transition, and really move on the other side. And we need to do the thing that was right for our customers. And even if it meant that the revenue base would be reduced by a factor of 2. Or something like that--

Vajapey: This was around 2003, 2004, even 2000--

Pelissier: --yeah, 2001 would be, right. Because 2004 we really spun off in 2002, right. And we went public, I think, at the end of 2003. And.

Vajapey: For purposes of history, the Fairchild division, the non-test division got spun out from Schlumberger at around which year? In the '70s or '80s?

Pelissier: I think it was in the end of the '70s.

Vajapey: End of the '70s.

Pelissier: But you would have to verify that, because.

Vajapey: And in that era?

Pelissier: But it was in that era. When I arrived myself in Schlumberger, that time was gone.

Vajapey: Has happened?

Pelissier: Right, yeah.

Vajapey: And Schlumberger had a good 15-year run with doing excellent equipment selling at the least?

Pelissier: Well, again, I think the world was finding our product, right. The Sentry 22 and I will remember always my--

Vajapey: You cut your teeth on that?

Pelissier: When I joined, you know, I joined. So, I was, you know, this researcher, developer, engineer in IBM, right. And I joined Schlumberger. And I think 2 weeks or 3 weeks later, I am at, I remember, at Electronica, right. And here it's my first show, right.

And I have this purchasing manager from a well-known company in Germany that comes actually with a purchase order of $45 million dollars to buy Sentry 20 or Sentry 21 on the show floor, right. And that was my first 2 days with Schlumberger. So, you know, Schlumberger had a very good time with Sentry 20, 21, which was almost a monopoly. And the second generation after that was the ITS9000.

Vajapey: And pressure from Wall Street forced Schlumberger to spin off NPTest, the test and debug machine division?

Pelissier: You know, actually, I was not anymore in Schlumberger at that time, right. I had created Sabre--

Vajapey: Sabre, Sabre--

Pelissier: --that service division, right--

Vajapey: That's right.

Pelissier: And then at the end of that, I joined one of my customers called High Connection Density. So, I was actually in High Connection Density at that time. And that's when, actually, Ashok Belani came back to see me, and asked me to rejoin Schlumberger, because the chairman had decided to exit with a known oil and gas business.

And as a result of having worked on all of the divisions, like the diagnostic equipment, and I knew about front end, and my background in microelectronics and so on, they asked me to actually work with him and start leading the effort and the spin-off outside of Schlumberger. But what was the reason exactly. Yeah, I think there was a desire to refocus on the core competency--

Vajapey: Refocus on the core competency of the company. So, Fairchild got spun out. The division of test kept with Schlumberger, which got spun out to NPTest. And then moving forward now with Sapphire in hand, re-targeting of the business for a different revenue base, new engineering team, you got acquired by Credence?

Pelissier: Yes.

Vajapey: How did that transition happen? Was it an easy marriage, an obvious one? Credence certainly was interested in the product line?

Pelissier: Yeah. I think the product lines were very complementary at the time of the merger. Credence was very successful in the off-shore business. I think that the Vista platform had come to its lifetime, and so far was extremely successful. And a lot of people were jumping on the bandwagon of Sapphire. So, Schlumberger and NPTest was finally doing something a little bit different from addressing the very, very high end of the industry. It was a platform, and a scalable and flexible platform capable of going from--

Vajapey: Modular too.

Pelissier: --modularity, I mean, from the low end to the high end. Not only that, but meets the low-end and high-end pin inside of the same tester, totally always a DFT technology. So, there was really a lot of flexibility and scalability in that test equipment. And I guess that's what the company and what Credence saw in--

Vajapey: Attractive.

Pelissier: --inside of NPTest.

Vajapey: So, this is a long history now. Now, how did you make the big transition from so much of test technology and everything else into universal instruments? This must be a big change. And yet, you have managed to turn Universal around and make it a premiere company?

Pelissier: It was already a premiere company. But, you know, like all long-time companies, they go through ups and downs and sometime need to refocus on their core competency, and so on. But, there is a joke about it. And there is the real story.

Vajapey: Reality.

Pelissier: Right. But the joke is I was really trying to find a business that was more difficult to run than test, right.

Vajapey: Is that possible?

Pelissier: And I found it. When we are in test we say it's volatile. And when we are at the end of the tail of the dog, I managed to find a place that is further down the tail of the dog that has 12 to 14 competitors in the space, and about the same size of the test industry.

So, yes. Universal Instruments is automation equipment for the assembly of electronics in general. So, we span from surface-mount machinery to be able to do PCB assembly using SMT technology, to inception technology to through-hole component through the PC board for surface-mount dies application, or applications that were actually large, secure and power component. And we do robotics and Cartesian robots that are used to do various things like dispensing, snapping, gluing, screwing, assembling together that are being used.

These are at the beginning of the back end for old form assembly, components that are a little bulky like a shield or like a complex structure on PCB, like a connector or very fancy connectors, down to being able to put things together, and assemble them, and screw them together, like a cell phone, for example, or like a control unit for an engine for a car.

So, we have a palette of technology. We can also apply those technologies to the back end of the semiconductor on our machine by picking dyes instead of picking the package component, and placing those dyes with very high accuracy directly on the substrate, such as to do with SIP, or a multi-chip module, or just placing the component in flip chip technology face down at very, very high speed.

So, those are very mechanical, very, very high-speed robots. And it's a captivating market, which really so literally is an integrator of the electronic system. So, we are seeing the product just before it is being shipped to customers.It's really the last stage before the box that is finally shipped to the end customer.

So, we see all of the electronic industry. That electronic industry is very fragmented in comparison to the semiconductor. Today, I have the pleasure to visit customers in North Africa, South Africa, Indonesia, India, so much larger territory. It's very close to the final application. So, it's very interesting in terms of seeing the dynamic of each of the segments of the market, like automotive, versus consumer, versus mobile, versus computer.

And a lot of people would like to know what I see and what I see in terms of number and capacity in the industry, because we have a very dynamic view of the market in general. It's fascinating. It's slightly different with capital equipment also. It addresses customers that are downstream. So, slightly different customers. And it's a place where I've been almost able to apply, I would say, 90% of what I had learned through my career in test. So, it was a relatively easy transition from that point of view. Obviously, relating to the customer and the technology are very different.

Vajapey: So, it's amazing. People struggle to go through one technology line, if you will. And you have made an amazing transition from very high technology testers and serving a small market, compared to going and serving a world's manufacturing base. And this first one was limited to semiconductor companies kind of concentrated in a few spots, to anywhere in the world, like North Africa, Indonesia, and everywhere else. And you made the transition very successfully?

Pelissier: You know, the passion is with the technology development, and is to be with customers that are transcending technology every day. You know, that's what motivated me when I was back in France, and I saw those electronic components in the window of that electronic kit reseller, and made me choose that I wanted to be in electronics. It's what keeps me working, I don't know, 60, 70, 80 hours a week since I have been in this industry with pleasure, and the same passion and enthusiasm. When you like technology, it's an incredible opportunity.

Vajapey: Well, that's wonderful. Thank you very much. Amazing career, and a very successful one all the way through. Wish you many more years of success, of course. So, thank you very much for recording for the Computer History Museum.

Pelissier: It was a pleasure to be here today. A great event, and an opportunity to be with incredible people, and seeing other technologies that maybe have not been touched through test directly, what I'm doing today. But that's certainly is a passion for me. Thank you. Thank you very much.

Vajapey: Thank you. Thank you.

END OF INTERVIEW

