SIOUX TECHNOLOGIES

source

DREAMING
THINKING DOING

THERMO FISHER SCIENTIFIC &
SIOUX TECHNOLOGIES
TAKE PARTNERSHIP TO
THE **NEXT LEVEL**

RISTO SIILASMAA:
'SUCCESS REQUIRES MAKING
THE **RIGHT CHOICES**'

dreaming

I was one of those little boys who was always staring out the window in class. My mind was constantly racing with all the information I was given. In fact, that has not changed since then. The dynamics in high-tech are enormous. Every day I see new opportunities to make the world a little better with our knowledge, skills and technology. However, today's Sioux Technologies would not have existed on dreams alone.

You cannot move forward without dreams. But you also need to stay grounded at the same time. A real difference is made by thinking and doing. That starts with ambition and not being afraid to lose what you have. It requires making the right choices and implementing them with a lot of creativity, conviction and empathy. You have to love high-tech, and above all, you have to enjoy undertaking something new in order to add value for your customers, employees and environment. For me, that is the core of Sioux.

Over the past 25 years, Sioux has grown into an international company with impressive competences and the ability to push technological boundaries. In doing so we have retained our culture of curiosity, openness, togetherness and knowing why we are doing all of this. That is not only the achievement of the people who are with me at the helm of Sioux, but of all of those old-timers and new dreamers, thinkers and doers who make Sioux our company. That makes me very proud.

Hans Duisters
CEO Sioux Technologies

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SIOUX TECHNOLOGIES

25 years of Sioux

'IF IT IS IMPOSSIBLE, JUST ASK US'

Sioux Technologies exists 25 years. During this time, an impressive international system house has emerged. The drive of founders **Hans Duisters** and **Erik van Rijswijk** remains unchanged: Sioux brings high-tech to life to make the world a little better. 'We regularly make the seemingly impossible possible. Our innovative strength is enormous, but our people are the ones that make it all happen. Cooperation, also with customers, is the soul of Sioux.' ◗

Hans Duisters and Erik van Rijswijk (from left to right) ⟩

'If you don't set the bar high, you don't push boundaries'

'Our innovative strength is enormous, but our people make it all happen'

A small office in the WTC Eindhoven, a metal shelving unit with some files, two phones on one connection, a laptop exchanged for outstanding holidays with the former employer and two guys who wanted to do things differently… That is pretty much the setting in which it all started 25 years ago for Sioux.

Broader view

'We had nothing, except the belief that we could do it better', says Duisters. 'Erik and I worked for large publicly listed ICT companies for years. The bottom line there was to make as much money as possible, as quickly as possible, which does not sufficiently motivate employees. That is unpleasant, especially when you focus on content and look at the world from a broader perspective. That is why we started for ourselves. With Sioux we

wanted to create real value, for us, our people, our customers and our environment: fun & value. That dream has now become reality.'

International system house

Fast forward. A quarter of a century later. Sioux has offices in the Netherlands, Belgium, Germany, Russia, Romania, China, Singapore and Vietnam. It employs more than 900 people and has an annual turnover exceeding 100 million euros. The company has grown into an international system house and provides support to high-tech OEMs in developing and building complex modules and machines. Over the past few years, the Sioux Campus in Eindhoven has gradually emerged. All competences come together here: software, mathware, electronics, mechanics, optics, mechatronics system engineering,

prototyping and assembly… The Sioux Campus now consists of 7 buildings, including the central meeting place Sioux Labs.

People and culture

'I regularly walk around here with a sense of wonder', says Duisters. 'We work on incredibly complex technology, for example for Thermo Fisher, NXP and Elekta. By combining all the expertise and talent within Sioux, we regularly make things happen that seem physically impossible. If it is impossible, just ask us. I find this not only unique, but also simply wonderful. Nevertheless, Sioux has essentially not changed.'

Van Rijswijk: 'Of course it feels different than before. The responsibility to keep Sioux going weighs more heavily now;

we have more to lose. In the beginning it was pure survival and now we are busy shaping a beautiful future-proof company. But the core is still the same as 25 years ago. With our solutions, we want to make the world a bit more beautiful, safer and healthier. We do this together, with good people in a good culture. Sioux is not the big Hans and Erik show. There are more people who take the lead here, including many veterans. We lift each other to a higher level and have a lot of fun at the same time. That fills me with a lot of pride.'

Extra bread

You cannot build a company like Sioux without trial and error. However, the partnership between Duisters and Van Rijswijk is still as close as 25 years ago. How do you maintain that in the pressure cooker of the high-tech industry? Van Rijswijk: 'We share the same values and standards, listen to each other and have a common goal. We both want to win. Average is not good enough; our ambition is enormous. But squeezing out orders to the last cent to put an extra bread on the table has never been our motivation. The soul of this company is cooperation between our employees and with our customers. Only then can you create real value. That has led to a steady and natural growth of Sioux.'

Pushing boundaries

'The secret of Sioux's success therefore lies to a large extent in staying true to yourself', Duisters adds. 'Pioneering is in our blood. With that attitude, I left for Suzhou two years ago. We now work there with about 100 people for Western and Chinese customers, and slowly a second Sioux is emerging in which all our capabilities are united. In addition, our development is characterized by adding new knowledge and expertise, for example in the field of photonics. Sioux is far from finished and that is a good thing. If you don't set the bar high, you don't push boundaries and there is no fun in that.' ⬡

Sioux Labs

'The living room of the Sioux Campus.' That is how project lead Jesper Huijgens describes Sioux Labs. 'It is a connecting element. A place where you can have lunch and organize meetings. Workshops are given and customers are welcomed. Sports, a barbecue with your team, working on your own project with a knowledge group, having a drink after work; it is all possible here. In short, it is a meeting place full of life and inspiration.'

According to Huijgens, Sioux Labs reflects the essence of Sioux Technologies. 'Work and fun go together. No matter how busy it is, the atmosphere is always good. But it is more than that. For partners of expats, social integration and finding a job is often difficult. This is how the idea arose to offer them a job at Sioux Labs. That idea has since been broadened and my Dutch girlfriend now works there as well. Another great example is the development of a planning application at Labs by external software developers with autism. All this reinforces our sense of family and underlines that we are not in this world just for ourselves.' ⬡

'There is plenty left to dream about'

Ruud Krijnen and Marnix Tas (from left to right) ›

Sioux develops and produces Ultra-X for Thermo Fisher Scientific

'THIS TECHNOLOGY WINS **NOBEL PRIZES**'

'The top of a technological roadmap.' This is how **Ruud Krijnen**, system architect at Thermo Fisher Scientific, characterizes the Ultra-X. The maximum speed and sensitivity of a detection system for the company's latest generation transmission electron microscope has been achieved. Sioux Technologies was involved in this exceptional technological achievement from the first development phase and started the pilot production of the module early 2021.

Thermo Fisher Scientific is world market leader in the development and construction of electron microscopes. In 2000, the company partnered with Sioux for the first time. Since then, Sioux has become a strategic partner within various R&D programs in the field of software development, system integration, electron optics and sample management. With the launch of the Ultra-X project, a new chapter in the cooperation started.

Accurate and sensitive

The Ultra-X is a detection system for the Spectra Ultra S/TEM, a high-end transmission electron microscope from Thermo Fisher Scientific. It works on the principle of energy-dispersive X-ray (EDX) spectroscopy. A sample is scanned with an electron beam down to atomic level. The interaction of the electrons with the material creates X-rays that are specific to the elements in the sample. The various atoms can be visualized to an accuracy of 50 picometres, including their characteristics. 'With the Ultra-X, we are taking the ultimate step in this technology', says Krijnen. 'The module is five times faster than its predecessor and offers users the possibility of adjusting the measuring conditions in a single session. This makes it possible to analyse the most sensitive materials very precisely, even dynamically.' ▶

'We lift our cooperation with Thermo Fisher Scientific to a higher level'

Upscaling

The second phase of the Ultra-X project concerned the industrialization and production. This was entirely in the hands of Sioux for a fixed price and timeline. Krijnen calls this phase at least as exciting as the development process. Tas agrees, stating that the complexity of the assembly of the system should not be underestimated. 'Thermo Fisher Scientific expects us to deliver completely qualified modules. Guaranteeing good serial production requires, among other things, setting up an optimal cleanroom process, developing and building our own production machines, training people and managing the supply chain. In June 2021, the first Ultra-X beta module left our production facility and we are now working on optimizing our industrialization process so that we can scale up to a solid supply.'

Hot cakes

Krijnen: 'The Ultra-X is of enormous added value to two important customer groups. First, there are companies in the semiconductor industry that can use this TEM technology for process optimization and control, for example, to set up new production lines faster and cheaper. In addition, TEM with Ultra-X offers new possibilities for materials researchers. This includes research for new batteries and space travel, and fundamental research into metals and other elements.'

'For the latter group of customers, the Ultra-X technology is a breakthrough that could win Nobel Prizes', says Krijnen. 'In fact, we are at the top of a roadmap; a faster and more sensitive EDX detection instrument does not exist, but there is plenty left to dream about. The previous generation of the module sold like hot cakes. The Ultra-X should be just as successful. Besides, we never have to complain about new ideas or a shortage of work here.' 'And for Sioux, it goes without saying that we want to take on more of these multidisciplinary development and manufacturing projects for Thermo Fisher Scientific', Tas emphasizes. 'In this way we lift our cooperation to a higher level.' ○

Magnetic fields and vibrations

Thermo Fisher Scientific asked Sioux to take on the full development and manufacturing of the Ultra-X. Krijnen: 'Thermo Fisher Scientific needs high-quality multi-disciplinary suppliers and with this project Sioux was able to demonstrate what it can do. The kick-off of the project was in February 2018 and that started with concept formation; taking note of what was needed to make the product a reality.'

'The transmission electron microscope (TEM) from Thermo Fisher Scientific is an incredibly complex device', says Marnix Tas, system architect at Sioux. 'The vacuum is very deep, the magnetic fields are extremely strong and it is highly sensitive to vibrations. This leads to very specific and high technical requirements, for example regarding materials, precision mechanics and electronics. We tackled the development process together with Thermo Fisher Scientific by working on partial solutions in cross-functional teams of specialists. This led to the detailing of the Ultra-X and the construction of a prototype ready for use, within one and a half years. That is an achievement on itself and not just technologically. These kinds of projects are always risky and under high pressure. From the start, we said to each other that what we do is so complex that emotions and politics should not get in the way. That's exactly how it turned out: the focus was always on good collaboration and achieving results.'

'CHINA IS HOT & HAPPENING'

'China is rapidly catching up on high-tech innovation. It is buzzing with energy here', says **Thomas van Schijndel**, managing director of Sioux Techologies Asia. 'The drive to move forward is enormous. It is wonderful to be part of that.'

How fast is technological innovation going in China?

'The country is ahead of the West, at least in the digitization of consumer products such as payment systems and online shopping. One of the many other examples of the incredible pace of development is the lightning-fast construction of 25,000 kilometers of track for high-speed trains. As a result, you can now travel across the country from Shanghai to Beijing in about 4 hours.'

Is China no longer the factory of the world?

'More and more products are being developed here. China is also rapidly catching up in terms of innovation in the high-tech industry. Companies are increasingly interested in open innovation with external development partners. Tech studies are incredibly popular. The number of patent applications out of China is unbelievable.'

Plenty of reasons for a Sioux office in China…

'A rapidly developing Chinese high-tech industry brings a lot of opportunities. The Sioux strategy is local for local. We work for developers of high-tech equipment. In addition, we are also growing along with our strategic international customers.'

What is your technological focus?

'Accurate positioning & motion, vision & sensing and equipment design & control. We are a specialist in soft- and hardware and combine that with in-depth knowledge of photonics and AI. With this, we serve the back-end semiconductor, medical and analytical industries. That is what we are heavily invested in here.'

Why?

'China produces 35 percent of the world's electronics but is dependent on the West for high-tech equipment. That is why own development is stimulated. In addition, China is dealing with an aging population. Hence the big commitment to innovation and technological developments to make healthcare better and faster.'

How does Sioux deal with the growing tension between America, Europe and China?

'This obviously brings opportunities, but it is also something we have to be very careful with. Sioux has ensured that the team in China can work completely autonomously and that no overlapping IT systems are shared with our European offices.'

What is the dream?

'We are now with about 100 engineers. Growth is always good. But above all, we want Sioux to become a household name for high-tech OEMs. In addition to R&D services, we are developing our own product lines and will start production in 2022, to be a complete partner for our customers.' ◘

'At Sioux I can make a direct and relevant impact'

Oksana Manyuhina

'I AM DRIVEN BY CURIOSITY'

Oksana Manyuhina started at Sioux Technologies as senior mathware engineer four years ago. The Ukrainian left an impressive academic career behind, which she has not regretted for a moment. 'Real people, the real world and solving real problems. That is what it is all about here.'

Manyuhina studied theoretical physics at the Moscow Institute of Physics and Technology and obtained her PhD at Radboud University Nijmegen.
She worked as a scientist in France, Sweden and the US. On her return to the Netherlands, a friend invited her to come and take a look at the Sioux mathematics department.

Curiosity
'I immediately felt at home', says Manyuhina. 'The atmosphere is friendly, there is no hierarchy, and the skill level is high. I am driven by curiosity. A problem cannot be complex enough. I want to get to the bottom of it and find a solution together. Here I have the freedom to do so, for concrete assignments and sometimes during fundamental research. The great thing about Sioux is that not everything is imposed from above. The company is constantly evolving and we all give it shape.'

Social impact
Manyuhina's work varies greatly, from modelling the effects of light on the growth of tomatoes to making use of artificial intelligence to better unlock press photo archives. 'This way I learn to see the world from many perspectives. At Sioux I can also make a direct and relevant impact. A good illustration of this is a small-scale social impact project where we helped the parents of a baby with epilepsy who was constantly on monitors in hospital. With our mathware, we made a camera smart. Next step would be to enable an automatic alarm system in case of threatening situations and seizures, also at home. This way, the baby can be with its parents more often. These kinds of social projects are also possible here, which characterizes Sioux.' ⬛
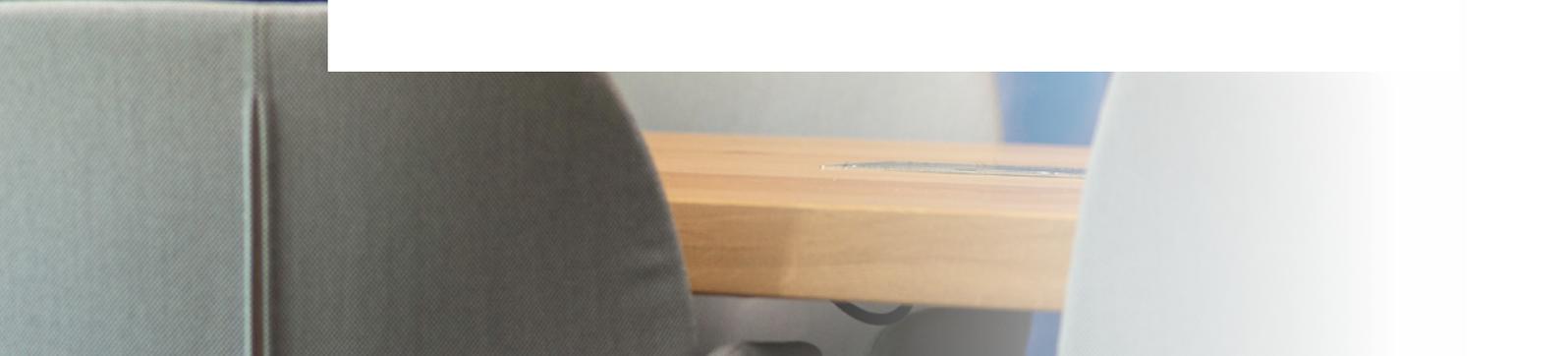
Classified and Sioux

'WE JUST LOVE **COOL TECHNOLOGY**'

Great cycling races have been lost on it: a chain that runs off the chainring because you pedal too hard when changing gears. Classified's **POWERSHIFT** shifting technology puts an end to this problem, even for the amateur sports cyclist. In addition, it is possible to change gears in a fraction of a second, thanks to the software of Sioux Technologies.

Two major brands have long dominated the huge market for bicycle drive technology. At the end of 2020, however, an innovative newcomer showed up: Classified. The Belgian-Dutch company introduced a game-changer with which it wanted to conquer the world: the POWERSHIFT. This is a state-of-the-art shifting system built into the rear wheel hub. It replaces the front derailleur and allows to change gears in a fraction of a second, under full load and with a large gear range.

Important and fun

The development of the innovative switching technology took Classified about seven years. A few weeks before the launch Roëll van Druten, CTO and co-owner of Classified, called Sioux. There were problems with the software, which had to be solved very quickly. 'I knew of Sioux's great reputation in the field of embedded software development. First, I was surprised that they picked up during Christmas, then at the enthusiasm and speed with which they responded.'

'He got a colleague on the phone with a passion for bicycles', says project manager Tatiana Ungureanu with a laugh. 'Sioux does not only work for large machine builders. We find it important and fun to help innovative startups,

especially if there is something to learn. This was also an opportunity for us to further expand our expertise in applying Bluetooth Low Energy technology, which facilitates wireless communication between the shifter on the handlebar and the shifting module.'

Eight bicycle manufacturers now offer Classified's shifting system as an option for various models. Integrated into their own carbon wheels, Classified's technology is also available at over more than 200 dealers. It gets raving reviews on many vlogs by sports cyclists. Meanwhile, Classified and Sioux continue to develop the technology.

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'Everyone who tests the POWERSHIFT is convinced'

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Encryption and user scenarios

Ungureanu: 'Our cooperation has resulted in a completely new software platform with various functionalities. Shifting now only takes 150 milliseconds and a user-friendly interface provides the cyclist with the necessary feedback and control. Security is guaranteed by good encryption and the system is energy-efficient because it only activates when motion is detected. Future-proofing the software platform also meant supporting more user scenarios, such as the seamless exchange of components and changing bikes, which adds quite a bit of complexity.'

Revolutionary technology

Later in 2022, the POWERSHIFT hub for mountain bikes will also be launched. Van Druten calls this the next milestone in the development of his company. 'The dream is to become an established player in the cycling community with a premium product that everyone wants. That is a huge challenge. Our technology is not to blame; everyone who tests the POWERSHIFT is convinced. Many have tried to develop a shifting system that can shift under load, but we succeeded. Our partnership with Sioux is of great value in this regard, to further pursue revolutionary technology and also because of the personal click. We just love cool technology. If there are problems, we never fire at each other; we think in terms of solutions and shift gears quickly.' ❏

Roëll van Druten and Tatiana Ungureanu
(from left to right) ❯

'Many have tried, but we succeeded'

Roëll Druten explains how the Classified POWERSHIFT system works and how the collaboration with Sioux Technologies started.

Leon Giesen meets Risto Siilasmaa

'SOFTWARE AND MATHWARE ARE CHANGING THE WORLD'

‘The best only want to work with the best’

Leon Giesen and Risto Siilasmaa (from left to right)

What does it take to be successful in the global and dynamic power play of the tech industry? Who better to ask this question than **Risto Siilasmaa**. He directed the miracle of Nokia, which went down dramatically in the violence of the smartphone industry but rose again as a global player in network infrastructure. Leon Giesen, CEO of Sioux Technologies Europe, traveled to Finland for a good conversation and recognized himself in Siilasmaa's story. 'Be agile. Cherish your people. Those who understand their customers and market are the winners.' ▶

Leon Giesen: 'I read your book – Transforming Nokia, the power of paranoid optimism to lead through colossal change – with fascination. As a market leader, you describe how you can be knocked off your throne very quickly. At Nokia the focus was on hardware, and the importance of software was underestimated…'

'Yes and no. A lot went well. We were the inventor of the app store, for example. But all companies have their own DNA, an embedded development approach that you don't just change. For example, in early Nokia history the company got used to building custom software

for every new phone. While that was obviously not effective in a fast-growing market with an ever-increasing turnover rate and more and more models, some aspects of the core development model remained and slowed the company down.'

'It also went very fast on the technology front, more computing power, memory and apps…'

'It was time to develop a decent operating system - Symbian. We wanted to set a standard and do this together with other large parties such as Motorola and Samsung. In principle, that is a good idea from a compatibility perspective, but not if you want to conquer the world. Within a coalition of competitors, no one is in charge. Everything moves slowly and it leads to suboptimal solutions. We sowed the seed for our own downfall, especially since iOS and Android suddenly saw the light of day.'

Moving forward together

'But tell me more about Sioux…you also operate in markets with tremendous dynamics and have to go along with that.'

'Our story is one of continuous transformation. Important steps were two acquisitions through which we acquired high-quality competences in mathware and mechatronic engineering. Now we are a service provider that takes on the complete development and construction of very complex systems and machines.'

'I am an engineer and want to know how everything works. What do you mean with mathware?'

'Mathematics that takes our software to the next level. For example, we can push the mechanical boundaries in accuracy of movement and very quickly analyse large amounts of data from sensors. This results in highly innovative equipment and applications, for example for the production of chips and batteries, pathology in the operating room, materials research and smart logistics.'

'Software and mathware are changing the world. You must be very close to your customers' technology.'

'When you are talking about Sioux, you are talking about customer intimacy. The mutual dependence is great, that is how we move forward together. Know your customers and your market; then you are a winner.'

Jump in first

'That is also one of the lessons Nokia has learned.'

'Which other lessons?'

'You have to do it yourself. High risks, high rewards – the winner takes it all; that is the reality in today's digital world. If you are tied to fixed structure, you are at a disadvantage. Agility and daring to jump in first is very important. Users of your products have the power. Because of the strong network effect, you can quickly lose them in large numbers.'

'Nokia sold the smartphone business to

Microsoft and shifted the focus to the network infrastructure. That was part of the solution.'

'Above all, we had to change our culture. This is usually not possible without drastically changing your organizational structure.'

'For Sioux, culture is key. It is fueled by growing together, learning, openness, trust, entrepreneurship, and innovation. We guard this very consciously and invest a lot in this. After all, that is how we help our people, customers and the world move forward.'

Data intelligence

'What do you see as the main challenges for entrepreneurs in the high-tech industry?'

'Software is leading, a lot of value is being created and redistributed in the cloud. We need to understand the logic behind business models. Why do things work the way they work? Being successful requires making the right choices based on a lot of information.'

'Data intelligence is key…'

'Sometimes you cannot predict what data is or will be valuable, so you have to dare to experiment. Study it, learn from it and understand it.'

'You have since left Nokia and are now spending most of your time investing in startups. You are also founder and chairman of F-Secure.'

'Cybercrime is one of the biggest threats of our time. The amount of attacks on companies and governments is enormous, as is the damage done. We provide protection and first response. For me, this work is also personal, it feels good.'

'Even in high-tech nowadays, everything is connected. Our customers are constantly under attack. By integrating security into development processes of systems, you can significantly reduce risks. That is why we are strongly considering investing in cyber security as a new competence as well.'

'Then you have to attract the best people. They want to be challenged and only want to work with the best. You have to offer them creative freedom and ownership.'

'That is a core value of Sioux anyway, and of course having fun.'

'You should laugh at least once in every meeting, that is true.' ⬤

'Cybercrime is one of the biggest threats of our time'

QUOD ELIMINATES MISCOMMUNICATION AND UNNECESSARY DOWNTIME

Sioux Technologies introduces an innovative logging tool for OEMs in high-tech. Software designer **Maurice van den Heuvel**: 'The added value is high, if only because of the enormous cost savings.'

Where did the idea for Quod come from?

'Engineers who work in the direct vicinity of a machine keep a logbook. In this way, they share all kinds of information about activities and results – for example, about testing and integration – even between different shifts. Often this is still done by means of a shared text file.'

A low-tech application in a high-tech world?

'Exactly. That is not useful. A large multi-national in the semicon industry, an important customer of Sioux, also saw this. It was impossible to work simultane-ously in the logbook. Updates were slow. You could write whatever you wanted in it – in your own writing style and definitions, according to your own point of view.'

And that resulted in?

'Miscommunication and misunderstand-ing. Sometimes we did things twice, and sometimes we missed important informa-tion. That does not improve the quality and speed of development. Unnecessary downtime of the machine also costs a lot of money.'

'Quod will find its way all over the world'

Sioux was asked for a solution?

'We built a proto logtool that eliminates all these problems and thus significantly increases the efficiency of the work. We developed this as a Sioux product because of its broader applicability: Quod.'

What does Quod do?

'It is a web application that is installed in the customer's data center or in the cloud. It is accessible from all kinds of devices, including a computer on the machine, and provides an overview of entries in a clear and unambiguous format. What is special

is that the machine's data logs are also placed directly in this timeline, so that you don't have to sort through a very large amount of data to find relevant data, for example.'

Where is the complexity in this development?

'To create a smooth flow and clear picture for everyone around the same machine. You want real-time information, even when there is a large amount of data to be processed. In the variety of devices that the platform must support, especially in

direct communication with the machine. The functional structure and the ease of use.'

That this was not already there…

'Quod is of great added value wherever complex machines are developed and built. It contributes significantly to the streamlining of processes, and therefore to quality and considerable cost savings. I am convinced that this tool will find its way all over the world.' ⬯

Solar Team Eindhoven gets a boost from Sioux Technologies

'WE WANT TO INSPIRE THE AUTOMOTIVE INDUSTRY WITH **INNOVATIVE IDEAS**'

What to do next? That was the question the 22 students of the ninth **Solar Team Eindhoven** asked themselves when they took over the baton from their predecessors. They had achieved great success, including four consecutive victories in the Cruiser Class of the World Solar Challenge in Australia. However, it was time to change course. They built the Stella Vita: a campervan that runs entirely on solar energy. Sioux Technologies helped them avoid common pitfalls in software architecture.

'We overcame a lot of challenges'

Luuk Roozen and Frank Kusters (from left to right)

Read more about Stella Vita

'Of course we could further optimize our existing technology and see where that would take us', says Luuk Roozen, system architect computer science of Solar Team Eindhoven. 'However, we had already demonstrated that a family car powered by solar energy was not a thing of the future. Lightyear is now actually bringing it to the market. Continuing along the beaten path was not sensible.'

Zeitgeist

It took two months of brainstorming, but then they made the decision: Solar Team Eindhoven was going for a world-first: the first recreational vehicle that generates enough solar energy to be driven and lived in. In doing so, it fitted in with the Zeitgeist. The camper is more popular than ever.

'But it's also very interesting from an innovation perspective', says Frank Kusters, lead system engineer automotive at Sioux: 'Campervans are built on platforms of small trucks; they are heavy and can drive up to a million kilometres during their lifetime. In reality they travel a fraction of that distance and are usually stationary for a long time when in use. So there is a lot of room for innovation and sustainability; also with the help of solar energy due to the large roof area and their canopy. Solar Team Eindhoven proved this with the Stella Vita.'

Many challenges

The Stella Vita looks nothing like the square white box with wheels that is now called a camper. It is a streamlined futuristic vehicle with a 60 kilowatt-hour battery pack and a top speed of 120 kilometres per hour. When stationary, the roof can be raised to create living space. Extendable solar panels create a solar roof of 17.5 square metres. Roozen: 'We developed and built it in eight months. Many challenges were overcome, for example in aerodynamics, the powertrain and the electrical design - but also in the software. The help of Sioux, a sponsor of Solar Team Eindhoven for many years, was of great value.'

Modest

'Software is crucial to the performance, functionality and safety of modern vehicles', Kusters emphasizes. 'It's no different with the Stella Vita. It controls and regulates the battery management system, the charging, the powertrain, the infotainment and optimal yield from the solar panels. These systems must work together seamlessly. Sioux has enormous knowledge and experience in this field. We gladly shared this with Solar Team Eindhoven. But in all honesty: our role was modest. We gave a push by ensuring that common pitfalls in automotive software design were avoided, for example by validating the architecture from the first moment with functional tests to avoid surprises afterwards. The real work was done by Luuk and his colleagues.'

Mission accomplished

On September 19, 2021, Solar Team Eindhoven set off on a journey from Eindhoven to Southern Spain in their Stella Vita. On the way, they visited universities, embassies and the European Parliament. On the public roads, they were quite the sensation. They became world news and with that, according to Roozen, the mission was successful. 'We want to inspire with innovations in solar-electric mobility and thus set the automotive industry in motion; that's the dream. I am convinced that one day I will go on holiday with a commercial version of our camper. But now it's time to reflect and make room for the next Solar Team Eindhoven. What they are going to do? No idea. But it will undoubtedly be exciting, and they too will be grateful for Sioux's help.' ◻

Thermo Fisher Scientific Bioscience and Sioux
work towards a safer and healthier world

'IT DOESN'T GET ANY BETTER THAN THIS'

The bioscience division of Thermo Fisher Scientific helps science move forward, for instance, with laboratory instruments, tools and reagents for their life sciences customers. Sioux Technologies has become a trusted development partner. Both want to take their partnership in biomedical research to the next level, for example, by developing complex mechatronics instruments that enable scientists to visualize and analyse cells to detect rare cells for immunological, cancer and stem cell research. 'We are ready for it', state **Arnoud de Geus** and **Steven Beeler**.

'Sioux takes full responsibility for the development and construction of complex modules and systems'

Steven Beeler was appointed director of software engineering Protein & Cell Analysis at the bioscience division of Thermo Fisher Scientific in Eugene, America, in 2018. This division has as many as 5,700 employees and was largely created through acquisitions. As a result, Beeler's club of software specialists is fragmented. The mutual differences in techniques and processes are huge. Although work is in progress, there is still no shared development platform.

Pool of talent

'This can make it difficult to develop our tools cost-effectively', says Beeler. 'One of my strategic goals was therefore to find external expertise and organize flexibility. This is how the cooperation of our division with Sioux came about. There is a match on many levels, first of all in terms of global footprint. In addition, Sioux has an enormous talent pool, also in the field of relevant knowledge domains such as image analysis, machine learning and artificial intelligence. I am also impressed by Sioux as a full-service system house for high-tech, an essential quality for success in our world. Our first joint project was a flagship product: The Flow Cytometer.'

Major innovation boost

The Flow Cytometer is an instrument for studying cells. A cell sample is passed through the device in a liquid and is 'shot' with light to unravel its physical and chemical characteristics. Sioux modified the software architecture with an international team of 25 people, thus realizing

∧ Steven Beeler

a major boost in innovation on an already existing product.

Arnoud de Geus, director of new business development at Sioux: 'Next, we worked in direct collaboration with the research department of Protein & Cell Analysis at Thermo Fisher Scientific on a foundation for future functionalities of the device, new visualization, and AI analysis of images. More recently, we started a large software development project that focuses on importing sequencing data - the DNA recipe that lies beneath the cell or protein - and processing and visualizing it with state-of-the-art algorithms in a cloud environment. In this way, we are increasingly operating as an extension of the R&D organization of Thermo Fisher Scientific Bioscience.'

Next step

Early 2022 a delegation of the bioscience division of Thermo Fisher Scientific will visit the Sioux Campus in Eindhoven. Subject of the meeting is, among others, the future cooperation. Ask De Geus how he sees this, and he leaves no room for doubt. Sioux, as a system house, wants to take the next step in the partnership.

'What Thermo Fisher Scientific does is extremely high-tech and complicated. We feel like a fish in the water. Moreover, we have already built up a wonderful portfolio in analytical technology and life

science solutions. We can take full responsibility for the development and construction of complex modules and systems. In this way Sioux also gives direction to the developments of customers and helps to accelerate their time to market. From our experience and multidisciplinarity, we are able to support the bioscience activities of Thermo Fisher Scientific even better, and we want to do so from a strong intrinsic motivation.'

Early diagnosis

Sioux wants to make the world a little bit better through innovation. 'It doesn't get much better than this in that respect', says de Geus. 'We focus on the development of highly relevant technology for the health and safety of people.' 'And we find each other in that, too', says Beeler. 'I really like what we do. We enable science to make a big difference, by creating new advanced therapies, enabling early diagnosis of cancer and mapping the DNA of viruses. Thermo Fisher Scientific has deliberately chosen to cooperate with Sioux. A great deal of mutual trust has been built up in recent years. Sioux has a deep understanding of our technology and a long-term strategy that helps us move forward. Our business is constantly changing, and innovations follow each other rapidly. Sioux is a partner who is always ready to scale up and has all the competences to do so. We are going to do great things together.' ✪

∨ Arnoud de Geus

Sioux Technologies has all the expertise to contribute to the success of high-tech products and production systems. The strength of Sioux lies in the unique combination of high-quality competences in the field of software, mechanics, optics, physics, mechatronics, electronics, mathematics, system integration and IoT solutions. With over 900 employees Sioux supports or forms the R&D department of leading high-tech companies. Sioux is happy to take responsibility: from thinking along in the concept phase to delivering series production. Together with her customers, Sioux wants to add value and build innovative solutions that can contribute to a society that is smarter, safer, healthier, more enjoyable and more sustainable. **For more information please visit www.sioux.eu**

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