Calyos: the digital twin that attracts new partners and strengthens the value proposition

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A virtual factory as a laboratory for innovation at Calyos

Calyos' cooling technology is drawing significant interest from global technology giants and automotive leaders. To support them in designing large-scale production lines, the company has developed a hyper-realistic digital production showroom.

Calyos is, first and foremost, a story of innovation where industrial research freedom, academic expertise, technology transfer and entrepreneurial spirit converge. Based in Hainaut, the company develops a cooling technology originally designed by Euro Heat Pipes (EHP) for aerospace applications. "This technology works without air or pumps, ideal for outer space," smiles **Olivier de Laet, Founder of Calyos**.

Around ten years ago, this spin-off separated from EHP to focus entirely on harnessing the potential of two-phase cooling for terrestrial applications. This technology enables rapid and efficient heat transfer, operates without moving parts, and requires little to no maintenance.

Photo: Olivier de Laet, Founder (right), and Antoine de Ryckel, CEO of Calyos (left)

Giants of electronics and computing

As an alternative to air or liquid cooling, the systems developed by Calyos quickly attracted attention from manufacturers across electric mobility, computing and data centres, and energy. Among its clients are BMW, Valeo, Safran and Noctua. “In this era of AI and climate change, cooling challenges have become absolutely critical,” continues Olivier de Laet. “Our technology is more powerful and energy-efficient, proven and perfectly logical,” adds **CEO Antoine de Ryckel**. Potential partners: major car manufacturers, hyperscalers operating data centres, and other leading players in IT and energy, are eager to explore how Calyos’ solutions could be integrated into their projects.

Technology centre business model

Calyos operates as a **technology centre** rather than a mass manufacturer. Instead of pursuing high-volume production, the company focuses on technological development and highly flexible prototyping. “Our aim is to produce only small test series and collaborate with major players capable of producing the large quantities of equipment they require, either in-house or through their suppliers,” explains Olivier de Laet. Forging such partnerships means co-developing the production process needed to manufacture two-phase coolers on an industrial scale.

A digital twin that convinces partners

This key challenge was addressed through Agoria and Sirris’ ‘Make the Future’ programme. Structured around **4 stages** and **7 key transformations**, the programme helps manufacturing companies translate their technological challenges into concrete, future-oriented solutions keeping them competitive and innovative. Applications range from energy optimisation and equipment modernisation to process monitoring, maintenance, talent management and collaboration with customers and suppliers.

As part of the **Smart Manufacturing** transformation, and with support from the **Mecatech cluster**, Calyos partnered with Eutomation to develop a **digital twin** capable of precisely simulating, in 3D, a production unit for its cooling systems. On **COO Cyrille Billet’s** screen, conveyor belts and robots demonstrate the operation of an advanced assembly line throughout an entire production cycle.

“Instead of building our own line, which would have cost nearly two million euros developing this simulator has taught us a great deal about the technical challenges such a line entails, and how to overcome them,” explains Antoine de Ryckel. “This highly accurate digital replica allows us to demonstrate that the production process can be fully automated, controlled and scaled for industrial deployment. The idea is to let partners virtually ‘step inside’ and gain a clear understanding of the simulated processes.” The CEO adds that this project has also convinced Calyos’ shareholders of the scalability of the solution.

Through this initiative, Calyos is also fully aligned with the **Integrated Engineering** transformation of the programme, designed to better meet customer needs through co-engineered, customised

products.

Cybersecurity and data management

Calyos' **Made in Europe** technology was designed for major industrial players and directly addresses key contemporary challenges including cybersecurity risks. "Our clients insist that our technology is protected to the highest standards. Such guarantees have become just as important, if not more so than ISO certifications," notes Olivier de Laet.

Calyos has therefore made significant progress in the **Digital Factory** transformation of the Make the Future programme. "For example, we're aiming for a paperless environment, whether it's design drawings shared between engineers or the collection and management of production and lab test data," explains Antoine de Ryckel. But digitalisation serves another purpose beyond security: "We want to apply AI to these data sets to further optimise our processes and ultimately enable the design of fully robotic production lines."

Both leaders also highlight the importance of the **Networked Factory** transformation, which focuses on accelerating innovation through strategic partnerships. "You can't do everything on your own. We are deeply embedded in a Walloon ecosystem of subcontractors and work closely with Mecatech, universities, research centres, and major international players to implement our technology," they emphasise.

Expert input

For Calyos, as for all participating companies, the programme began with a Factory of the Future Scan, carried out with the support of **Alain Jacques, Senior Engineer Manufacturing Strategy at Sirris**. This analysis helped assess the company's maturity level across the seven strategic transformation axes, and to define clear objectives aligned with Calyos' priorities and pace.

"Our small team of twenty people is agile and able to implement change quickly. Transformation is part of our culture, but we must remain pragmatic and move forward step by step," says **Antoine de Ryckel**. "The idea is to assess our progress on the seven transformations together with Agoria and Sirris at the end of the year. Alain brings valuable insights from other companies he's visited, sharing best practices and fresh perspectives."

***This article is part of the Make the Future programme by Agoria and Sirris**, supporting manufacturing companies in becoming more competitive, innovative and sustainable. It relates to the Digital Factory transformation, one of the seven key transformations which helps companies automate processes, anticipate challenges and make faster, data-driven decisions.*

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