

ATHOS PARTNERS WITH JABIL TO RAMP PRODUCTION OF GROUND-BREAKING SMART FITNESS APPAREL



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**Dhananja Jayalath,
Co-Founder and CEO, Athos**

Case Study



ATHOS

Company	Athos
Industry	Health, Wellness and Fitness
Country	USA
Employees	50
Website	www.liveathos.com

CHALLENGES:

- Embedding hundreds of electronics components into pioneering fitness apparel presented considerable hurdles
- Unique hardware start-up required a flexible, end-to-end partner that could scale from concept to production with top quality output

SOLUTIONS:

- Athos selected Jabil over other tier-one manufacturers because of its world-class plastics and molding expertise and end-to-end services
- Jabil was a better cultural fit as the company was passionate about pushing the boundaries of innovation

WHY JABIL?

- Jabil's plastics, molding and assembly expertise enabled Athos to fulfill its goals of building its state-of-the-art core
- Jabil's supply chain expertise offered sourcing alternatives and economies of scale
- Jabil's end-to-end solutions simplified an extremely complex process while ensuring high quality production
- Proximity to Jabil's Blue Sky Center will accelerate next-gen product development
- Close alignment with Jabil will enable additional support for garment inlay production

Athos, a startup based in Redwood City, Calif., is poised to transform the fitness industry with the world's first smart fitness apparel that measures muscle activity, heart rate and respiration in real time. Using sophisticated and expensive electromyography (EMG) technology that previously was restricted to elite athletes in lab settings, Athos is redefining how fitness and performance are measured.

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**Hamid Butt,
VP of Hardware
and Operations,
Athos**

The revolutionary idea behind Athos started with a simple premise: Co-founders Dhananja Jayalath and Christopher Wiebe wanted to get more out of their gym workouts, but as college students, they couldn't afford a personal trainer. Instead, they applied what they had learned in the electrical engineering program at the University of Waterloo in Ontario, Canada, to figure out a way to embed bio-signal sensors into fitness clothing. "We realized the science existed, but there was no way to measure muscle activity without being tied up to some equipment in a lab," says Wiebe, CTO of Athos. "As college students, anything seemed possible."

Fueled by the idea that immediate feedback during exercise would deliver the greatest overall benefits, Wiebe and Jayalath developed a prototype fitness shirt and accompanying smart phone app as their senior design project. Their goal: Integrate the technology found in EMG machines - that cost tens of thousands of dollars - and shrink it into a form factor that could be worn during exercise. "What inspired us was the opportunity

to give people real-time information about what their muscles were doing, so they could change their behavior to improve overall health and wellness," explains Jayalath.

The leap from senior project to startup business happened fast. During the duo's fourth-year design project symposium, Jayalath and Wiebe met an alumnus, a former Facebook exec and Bay Area venture capital firm owner who was part owner of the Golden State Warriors basketball team. This encounter resulted in a follow-up meeting in the Bay Area, and soon there was seed funding to turn the ingenious project into a breakthrough product. So, after graduation, the fitness pioneers headed to the Bay Area and started Athos.

Turning a Great Idea into a Cutting-Edge Product

To make their vision a reality, the team focused on building an end-to-end solution encompassing embedded sensors, a mobile app and fitness apparel. "Our goal was to figure out how to make the technology disappear, so that it was all about

the user experience," says Wiebe. Of course, this was no easy feat. There were multiple wires and electrodes to be embedded into the apparel and it had to be durable enough to survive repeated washings while being comfortable enough to wear like traditional workout attire.

As employee No. 5, Hamid Butt, VP of Hardware and Operations, applied his vast consumer electronics expertise to help create the "core" - a small data acquisition and processing module that could be clipped into any Athos smart garment. Considered the brains of the operation, the core collects and analyzes all the physiological data from the embedded sensors in the apparel and sends it to a mobile device using Bluetooth. Building the core was daunting as it needed to collect and measure data from sensors measuring eight muscles from the lower part of the body, 12 from the upper body, and heart rate and respiration.

A seasoned consumer electronics executive, Butt understood the unique challenges of integrating complex technology into a simple, elegant design. "We wanted the core to look like a jewel, something you would be proud to hold in your hand," he says. "The core couldn't have any visible electronic connectors." The apparel needed to have a similar clean, futuristic look and feel. "Wires couldn't be hanging loose; otherwise it would look like a 1950s space shirt," continues. "In building the core and integrating the technology into the apparel, it was clear we

were trying to do something that had never been done before."

Perfecting a Wash 'n' Wear Prototype

As part of design and development, Athos sought a tier-one manufacturer to help navigate the uncharted territory. "We wanted to build a partnership that went beyond the contract," says Jayalath. "The ideal partner would accept our many challenges and work with us to make a quality product that could scale quickly from concept to production."

Equally important was finding an end-to-end solution provider with a full range of capabilities that would let Athos focus on its core competencies. The ideal partner also had to be comfortable with the unpredictable world of startups. "Hardware companies are considered the 'double black diamond' of startups," says Jayalath. "So we needed a partner that could help us with product design, development, supply chain and manufacturing."

The ability to adapt to changing requirements also was critical. "Because the scope of what we were trying to build was so complex and there were so many moving parts, there were many opportunities for something to go wrong," adds Wiebe. "We needed our manufacturing partner to be extremely flexible in taking our design through several cycles to where we could ramp production."

While Butt had worked with most of the top manufacturers previously, his experience with Jabil's Green Point team during his tenure with previous employer, Leapfrog stood out. "I had worked very closely with Jabil Green Point and their plastics and molding knowledge is world class," he says. "They innovate the overmolding process much better and have more of a knowledge base than anyone else."

Moreover, Athos felt that Jabil understood both the challenges and opportunities facing the small company. "Jabil saw the vision of what we were trying to do and wanted to help us build it the right way so it would scale over time," Jayalath says. "Not only did the Jabil team bring a lot of knowledge across all the hardware processes, they had a manufacturing and supply chain passion that instilled trust that things would get done at the quality bar we expected."

Flexing Manufacturing Muscle

Jabil helped Athos scale from concept to production. First, they refined the core, going through multiple iterations, overmolding redesigns and custom builds to improve reliability and production yield. And, Jabil even recommended a different type of glue to reduce drying time from 24 hours to one hour.

As a result, yields and reliability made quantum jumps. "We were doing something very difficult with the core and it required a devoted partnership," adds Butt.

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**Christopher Wiebe,
Co-Founder and CTO,
Athos**

“Jabil brought in the right plastics experts, testing tools and processes to collaborate with us on every aspect.” The Athos team spent time at Jabil’s manufacturing facilities in China and Taiwan working through the process. “Jabil was right alongside us step-by-step as the product took shape,” says Wiebe. “Their manufacturing facilities were great environments for product iteration and testing. And, support around logistics and assembly has been amazing, which is huge considering there are hundreds of components that go into making the core and fitness wear.”

By taking advantage of Jabil’s supply chain expertise, Athos has achieved sourcing economies of scale while consolidating the delivery of components to Jabil’s manufacturing facility in China. “Jabil is highly motivated to simplify and manage the whole process,” adds Jayalath. “If we have a 4x increase in volume, we know the process will get done. The parts come in, the cores go out. We trust Jabil is taking care of everything, which is the best place to be.”

Partnership in Innovation: Jabil Blue Sky

As production continues to ramp, Athos’ smart fitness apparel is being embraced by world-class athletes who are taking their workouts to the next level. Additionally, personal trainers who train top athletes and celebrities across the U.S. are using Athos to push workout boundaries.

Meanwhile, Athos and Jabil continue to push boundaries on the manufacturing side by taking advantage of ongoing platform and process innovations. The team has convened at Jabil’s Blue Sky Innovation Center in San Jose to review leading-edge manufacturing automation and miniaturization processes that could help drive future advancements. “Blue Sky is the place for us to develop our next-generation products,” notes Wiebe. “Instead of taking a 15-hour flight to China, we can travel one hour to Blue Sky, complete cycles faster and share insights with experts in every core competency.”

Athos expects Jabil to play an ever-increasing role in its quest to add more intelligence into its smart garments. “Jabil’s expertise will prove valuable in helping Athos revolutionize how electronics get integrated into apparel,” says Butt. “More pieces will come upstream to Jabil, such as the inlay that is bonded and sewn into the actual garment.”

To further its record of innovation, Athos is thankful for its alignment with a like-minded company. “The culture of Athos and Jabil really align when it comes to innovation,” concludes Jayalath. “We both believe in pushing boundaries and are passionate about what we do. We’re equally excited by the challenges and committed to using our collective skills to deliver on those goals.”

About Jabil

Jabil is an electronic product solutions company providing comprehensive electronics design, production and product management services to global electronics and technology companies. Offering complete product supply chain management from facilities in 27 countries, Jabil provides comprehensive, individualized-focused solutions to customers in a broad range of industries. Jabil common stock is traded on the New York Stock Exchange under the symbol, “JBL”. Further information is available on Jabil’s website: jabil.com.