

# A Big Step Forward

A pair of red, low-profile shoes is positioned above the word 'Big' in the title. The shoes are rendered in a simple, clean style with a dark sole.

Krispian Lawrence co-founded Ducere Technologies with Anirudh Sharma in 2011. Lechal is the outcome of their concerted efforts to use haptics in the wearable technology space.





**“OUR PHILOSOPHY is that if a product is designed appropriately, then it should not matter who is using it.**

KRISPIAN LAWRENCE



**B**oth Anirudh and I were always fascinated by wearable technology, and were tinkering with various ideas in this space. But the concept was nascent in India when we started Ducere Technologies. We were not only venturing into a less-explored territory, but also pushing it a notch further by building the world’s first smartshoe.

The basic idea behind Lechal was to see how haptic technology, which is related to the sense of touch, could be used for assisting the visually impaired in navigation. And what could have been better than shoes! No one leaves their home without a pair of shoes; it is like a natural extension of the human body. Initially, we wanted to design a haptic-enabled shoe only for the visually impaired. But after the first prototype, we decided to make this technology available to tech-savvy users and give them a wearable product that will make navigating hassle free.

### **THE TECHNOLOGY BEHIND IT**

While designing the product, we realised that every user has a different idea of how his or her footwear should look. Also, the shoe may not be preferred by

all age groups. To eliminate this constraint, we decided to launch polyurethane insoles that are slim enough to fit any type or size of shoe. With these insoles, users can integrate the technology in their existing footwear and enjoy the benefits of a smartshoe without compromising on style.

Pods is the revolutionary technology that gives our products an edge in the market. The compact stainless steel pods are made from a simple metal powder that goes through a 15-step manufacturing process. Both the products are used for navigational purposes and communicate with the user through vibratory feedback. The user needs to install the Lechal app in their Android or iOS phones to connect with the pods. The shoes and insoles have inbuilt vibrators, proximity sensors, and haptic actuator—all that users need to do is set the destination in the app and through vibratory feedback the shoes will guide them. If a person needs to take a left turn, the left shoe will start vibrating almost 1 km before the turn. The vibrations also change in variation with changing distance. This eliminates the need for listening to any directions, looking at the screen, or checking the route.

**The product can be utilised for three broad purposes: navigation, fitness, and interaction.**



**NAVIGATION**

Lechal is aimed at providing the user with hassle-free navigation—be it walking, cycling, driving, or hiking—and makes exploring easier. A user can go to any country and just add their destination, and the shoes will ensure they reach the right place. The app also works offline, so having a data connection is not mandatory. Another unique feature is the fact that users can create their own paths and share it with other Lechal users. For instance, if you discover a new trail while hiking, you can tag it and share it with others, hence simplifying the process for them.



**FITNESS**

It also doubles as a fitness tracker—counting the steps taken, calories burnt, and distance travelled—and as a fitness coach, wherein you can set targets.



**INTERACTIVE**

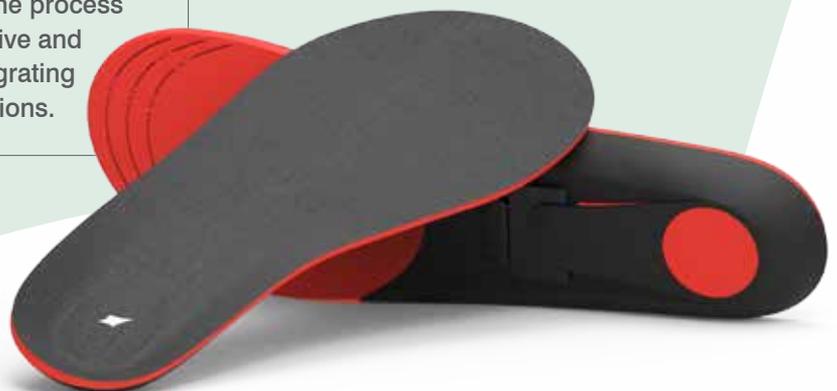
Apart from being intuitive, it is also interactive—Lechal users from across the world can interact with each other, race, compete in real time, and share their milestones. The app also responds to voice commands and other simple gestures such as tapping the shoe to tag a location. We are in the process of making it more perceptive and user friendly, and are integrating more gesture-based functions.

**DESIGN, THE CENTRAL CORE**

Our philosophy is that if a product is designed appropriately, then it should not matter who is using it. We are primarily a product-based company, but design has been the core of our operations from the beginning. Even though we started off building it for the visually impaired, aesthetics and fashion were always our main criteria. The shoes have to look good and be comfortable, and from that perspective we are more of a fashion company than a wearables company. We believe that wearable technology is the future of fashion—we are already witnessing people displaying their fitness bands or smartwatches—and smartshoes will be the next progression. We envision a future where shoes with inbuilt technology will be the norm and users will depend on their shoes for navigation.

**INDIA EDGE**

The entire project—from conception to designing to manufacturing—is based out of India. And if you design a product to work in India, you can be rest assured it will work elsewhere too, and that has been our competitive edge. When we started, we were one of the few wearable technology companies and among a handful of hardware startups in India that were also manufacturing products. But the competitive advantage we enjoyed due to working out of the country was lower operating





All images courtesy: Lechal

costs compared to other countries such as the US. Starting a similar company in Silicon Valley would have been extremely cost exhaustive. And with a lower operating cost, we could develop a low-cost product for the visually impaired. In addition to this, the country is a talent pool of engineers and designers who are skilled, innovative, and ready to take challenges.

Also, there was the huge challenge of designing a location-based technology in a country like India that has thousands of bylanes and alleys. When we started designing the product, Google Maps was not as accurate as it is today, so we would often get lost trying to locate a particular alley. Hence, we developed our own algorithms to create roads if it did not exist on maps. This helped us understand the technology better, enabling us to offer our consumers a more seamless experience.

We raised US\$2 million in 2014 through a combination of angel investments and debt, and are in the process of closing another round of funding. From an era of limited resources, we are entering a time of limitless opportunities. However, as Indians, I think it is in our DNA to be frugal—we are equipped to achieve the best possible results with the minimum resources available. And that has also been our motto—we have developed a world-class product despite the limitations in the ecosystem.

India is at present one of the great places to build hardware products. Some of the key initiatives of the Government such as fast-tracking of patent applications, tax rebates, and fund allocation for setting up manufacturing plants to boost IT product innovations, are encouraging moves.

## THE FUTURE

The first batch of the world's first haptic footwear was successfully shipped to more than 30 countries recently. We witnessed and enjoyed a mix of buyers in our first shipment, from members of royal families to professional athletes to the visually impaired.

Our first target for this year is to get the product out in the market. We have identified four geographies apart from India where we would like to establish a strong foothold—North America, Europe, the Middle East, and Australia. We are in the process of tying up with local retailers, and distributors and getting the product to the shelves.

We recently tied up with an international sporting and outdoor brand to launch a co-branded product line by mid-2016. We will be launching more styles of Lechal and coming out with a whole new category of sports shoes. As a wearables company, we are also working on other wearables and we intend to launch at least one new product every year. ■

*As told to Titash Roy Choudhury*

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