

Assembling and disassembling

Aly Khalifa is the founder of Designbox, a product and graphic design company based in Raleigh N.C. that is dedicated to 'design innovation and inventive culture'. Having designed shoes for a variety of clients, he has some original views on how the footwear industry needs to move away from what he sees as its current default position of manufacturing using generic designs, toxic adhesives and factory labour.

"In a world where trends change faster than you can tweet about them, it's hard for shoe companies to keep up when their products are assembled half way around the world and the people making the shoes have no concept of the people wearing the shoes and vice versa." Through his latest enterprise Lyf Footwear, he is seeking to tackle these perceived problems in a radical if not revolutionary manner by using a design framework known as 'integrative innovation', a process through which the best ideas come out of combining all challenging problems into one big creative task.

"The footwear industry needs to get really creative and think outside of the conventional shoe box. One of the biggest problems is globalised manufacturing and the disconnect between buyer and seller. Guessing what your customer wants rather than making exactly what they really want is high risk. If trends change before a shoe hits the stores, you have no way to alter it, nor recover the full manufacturing cost."

He plans to achieve this by producing custom-fit, custom-fashion shoes using local assembly, 100% recyclable materials and with a low carbon footprint. Construction is by a mechanical connection system using interlocking components and was inspired by Japanese Shinto joinery where clever design without screws or adhesives has produced structures that actually become stronger over time. It uses no adhesives and requires no tools, so in effect, the shoes can be made by anyone and anywhere. Shoe kits have been available for a long time but are essentially low tech, usually rather crude and lacking any customisation in terms of design and fit. Lyf shoes are most certainly not.

The technology used to create the customised fit and the actual components that are used, is highly advanced. It utilises the most advanced digital manufacturing tools to combine micro-scale production with full retail customer involvement. Individualised components are created on demand and footwear is customised for both fit and fashion. It has also been a long process. In fact, although Aly Khalifa has been developing Lyf Shoes technologies and methodologies for more than a decade, he is only now

getting started with consumers. With the constant and rapid changes in 3D printing which he uses to produce some components and all the other development work during this period, it has taken several generations of product to reach where he is today.

The patented product engineering involved eliminates any need for complex machinery, adhesives and the drying ovens they require as well as the substantial labour content normally required in the industry. Shoes are assembled on demand which the company says is ideal for intimately meeting consumer needs with the lowest carbon footprint possible. By following a decentralised manufacturing model, the barriers of entry are removed and the way paved for micro-enterprise development across the world as a way to incorporate indigenous textiles from rural villages offering custom prints through to being a gateway to digital manufacturing.

By offering consumers a buy-back programme, Lyf is also pioneering what it refers to as 'Symmetrical Manufacturing' whereby each assembly facility also disassembles the shoes and sends the resulting components back to OEM (original equipment) manufacturers, creating

Assembled ladies shoe.

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what it claims to be the industry's first 'closed loop' shoe. It also uses a clever digital capture device that tracks biomechanics and builds user profiles. This allows it to identify user needs and make each pair of shoes better than the last through direct interaction with the consumer.

"Since we only make what we sell, we eliminate the huge amount of waste typical of the shoe industry. The construction of the shoe itself is uniquely free of the toxic adhesives used in footwear. Lyf shoes are designed for complete disassembly, so each pair of shoes can stay out of the landfill and be recycled into a new pair. It's a lot like the boy scout mantra of 'pack it in, pack it out', meaning that if you put something into the world you should be able to take it back at the end of its use period and then regenerate the next one."

Lyf Shoes are designed to be a platform of expression for creative people, so the company focuses on consumers who relish creative expression, demand quality products and like to feel good about where their product is coming from and where it is going. Its first line consists of a single casual silhouette for women and another for men. Within that platform there are a multitude of fit, fashion and technology options which it believes will keep its customers captivated and their group busy for quite a while. Since the business model relies on closing the loop with customers in order to make their next pair better, the company believes it will gain valuable direct feedback on the next lines to be released.

The company is fully committed to using sustainable sources and hopes to achieve full Cradle 2 Cradle certification across its products. This is made apparent by the focus on all natural fibre uppers (biological nutrient which can go back into producing new fibre or else be turned into soil) and 3D printed elastomer (technical nutrient which is also fully recyclable). This is all tightly controlled via a closed-loop returns programme where customers get a 15% discount on their next pair.

Asked how the shoes are able to be 'a custom fit', Aly Khalifa says, "We have a wonderful last designer who has created the proprietary files on which all of our shoes are based. We leverage some sophisticated methods to 'virtually last' our shoes in lengths, ball widths and heel widths. We even split pairs since most people have one foot longer than the other. While this is a massive amount of data it has given us the ability to fit customers in a radically different way. As a result, we have bypassed traditional methods of shoe making so that we can efficiently produce a truly innovative and customised product in-store."

Shoe components are produced and sold on-site at a ShopOp (retail shop/operation) using a minimum amount of equipment and without the use of VOCs in assembly so that the process is entirely clean. The overall growth plan is based on a distributed manufacturing model called the Lyf Partner Program where local entrepreneurs can be certified to make shoes on-site. Once a customer has their Lyf Fit profile saved with the company, they can be confident that every future pair they buy will fit perfectly in the same way as going to a traditional bespoke hand shoemaker.

As the company expands into new markets, it also plans to engage local designers to create graphics for uppers that suit that particular market, local IT experts to modify the digital Lyf Tracker system and local material suppliers who are able



Disassembled shoe.

achieve its quality standards. In other words, adapting itself to meet the needs of the individual regardless of background or where they live.

Summing up his philosophy, Aly Khalifa declares that "Lyf Shoes is a company dedicated to making footwear for a better planet. All of us in the footwear industry know that we have a lot of environmental, health, and production challenges. By rethinking the process of how shoes are made and sold, we believe we have discovered a unique opportunity to integrate job creation, customer service and sustainability into a new paradigm." This could resonate strongly with many environmentally concerned consumers as it would appear they have all the answers as far as they are concerned. However, it will doubtless take time. 📌