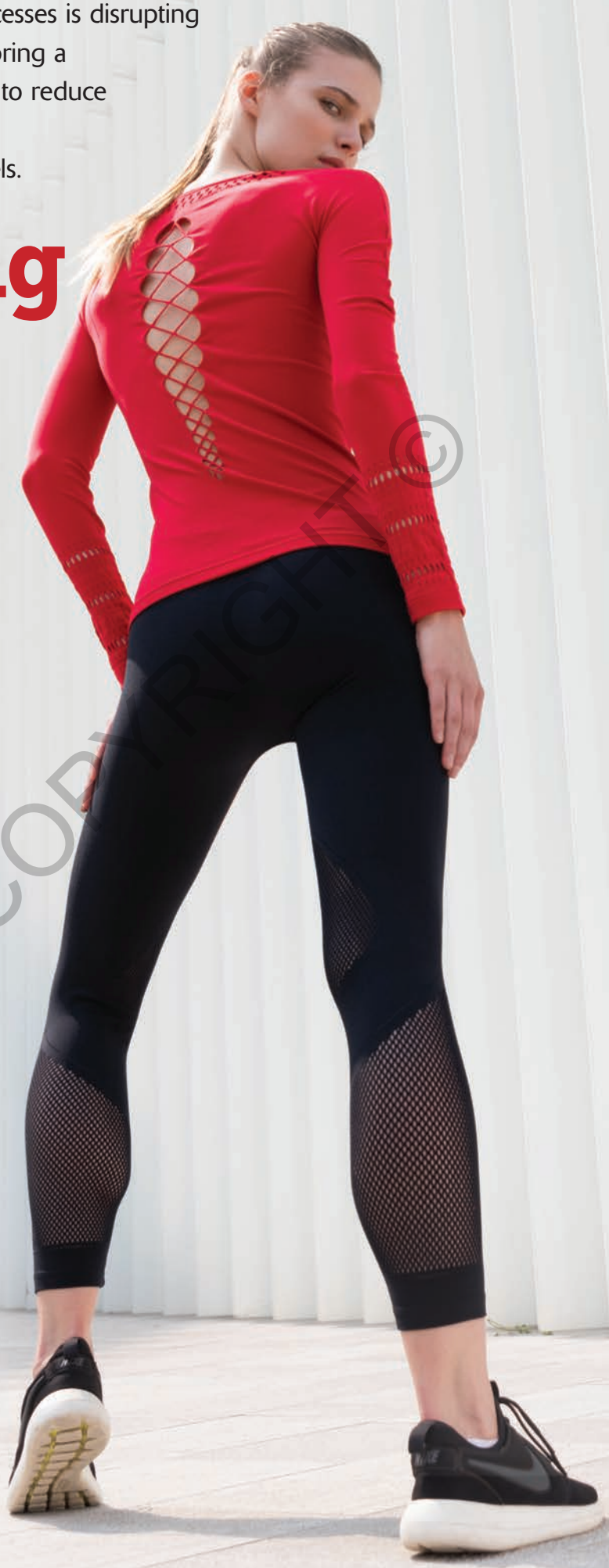
Innovation in technology and work processes is disrupting the traditional sequence of events that bring a product from idea to market. The need to reduce lead times is driving a trend that is also opening the way to new business models.

Rethinking business as usual

The broad concept known as Industry 4.0 – considered a fourth industrial revolution to follow steam, the internal combustion engine and information technologies – covers a vast array of innovative processes and machines that are impacting the textile and garment industries along with many others. Behind the hype building up around automation and artificial intelligence, it can be argued that examples of the factory of the future are already in operation.

One case could be Cifra, an Italian company specialising in seamless warp knitting. Based in Verano Brianza near Milan, it first made agrotextiles before changing course to make fancy hosiery. In 1997, it embarked on yet another new direction. This was the year that Japanese fashion designer Issey Miyake created A-POC, an acronym for A Piece Of Cloth. The concept was based on a single roll of tubular knit from which a consumer could cut out several items of clothing (tops, gloves, socks, skirts and others). When Cifra chief executive, Cesare Citterio, discovered this innovative approach to garment design, he believed he could industrialise the process invented by Mr Miyake.

More than 20 years later, Cifra has developed and patented a knitting technique it calls Warp Knit Seamless (WKS) that makes seamless items of clothing at a fast pace. The company has recently placed an order for a twenty-eighth Karl Mayer raschel double-needle bar jacquard warp knit, adding to its production capacity of 10,000



After tapping the athleisure trend, Italian mill Cifra, a key partner of companies including Lululemon and MAS Holdings, is now seeking to develop products for men.

WKS-Cifra

Innovative Chinese sportswear brand Particle Fever has partnered with antimicrobial specialist Polygiene. Julianne Zhu, the brand's marketing director, states that sustainability, embodied by Polygiene's slogan "wear more, wash less", is becoming more important in China.

Polygiene and Particle Fever4

garments per day. From Lululemon to Armani, major sports and fashion brands are key customers. "The process we have developed is very flexible and is akin to tailor-made mass production," Mr Citterio tells *WSA*. As an additional "green" perk, he says the technology generates little waste.

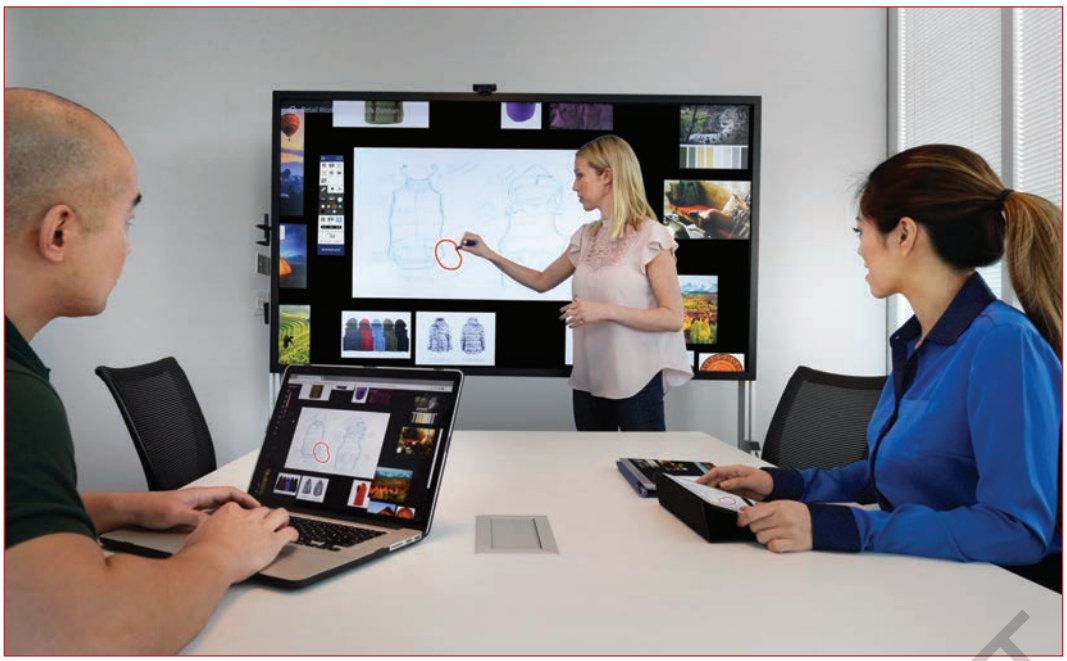
Cifra's WKS technology can be used to make sophisticated body-mapped clothes, shapewear and compression wear because the garments have few or no seams. Looking to expand beyond bodywear and baselayers, the company is looking to develop mid-layers and soft shells. It works with many high-tech yarns, including fibres made by Fulgar, Nilit and Aquafil. Nylon dominates its production line, but Mr Citterio would like to increase its range of natural fibres, especially merino wool. Men's clothing is another market he intends to develop, as women's clothing makes up 90% of the company's current business.

While Cifra is betting on automation, reducing finishing processes and waste, other textile companies are reorganising their resources to offer more options and more flexibility to their customers. This is how Olivier Balas, chief executive of Balas Textile, based near Lyon, in France, is preparing for the future. With its two historical partners and now shareholders, Groupe Mouzon and Tissage Robert Blanc, Balas Textile has become the 'technology hub' of a network of companies active in knitting, weaving, dyeing and printing. "We work with eight different companies, all located close by, and our activities generate 250 direct or indirect jobs in the area," Olivier Balas tells *WSA*. Balas Textile is in charge of finding new markets and replying to tenders in any of the four sectors that the company has come to specialise in: sports clothing, including men's swimwear, downproof fabrics, military uniforms and workwear. In addition to sales and marketing, Balas Textile has invested in a testing laboratory to verify that the fabrics developed comply with the requested technical characteristics. The lab space is stocked with devices that measure evaporative and thermal resistance (skin model), downproofness, moisture management, pilling or abrasion resistance, and others. By pooling the expertise and know-how of several companies, Balas Textile has access to a wide array of technologies. Oliver Balas mentions its ability to deliver high vis fabrics in orange and red, said to be particularly challenging colours, as one of the company's assets. The expertise it has gained in downproof fabrics has attracted many of the world's major puff jackets brands.

Consumer first

As these new business models take shape, companies within the textile supply chain are also feeling the need to reach out beyond the scope of current customers to gain a better grasp of evolving market needs. This strategy is seen as a way to drive demand throughout the supply chain and helps ingredient brands build their markets. Lycra, which is in the process of changing hands from Koch-owned Invista to Shandong Ruyi, has a long history of polling consumers to help it articulate its marketing campaigns. The latest platform launched by the branded elastane developer was dedicated to Lycra Sport and presented in early 2018. Other companies organise focus groups with their own customers to better brainstorm the future.

US polyester producer Unifi unveiled a new approach to its portfolio of products at the Outdoor Retailer Show in Denver in late July. It has created a platform called Profiber which



Bluescape's digital platform is designed to enable companies to work faster and more efficiently thanks to a single virtual and collaborative workspace where internal and external teams can interact smoothly across all types of devices.

Bluescape Software

brings together the many functions that can be added to its polyester and nylon yarns. Unifi says this move helps make its performance technologies more "benefit focused", be it added comfort or performance. This it believes will make it easier for its customers to select the properties that are best suited to their particular markets.

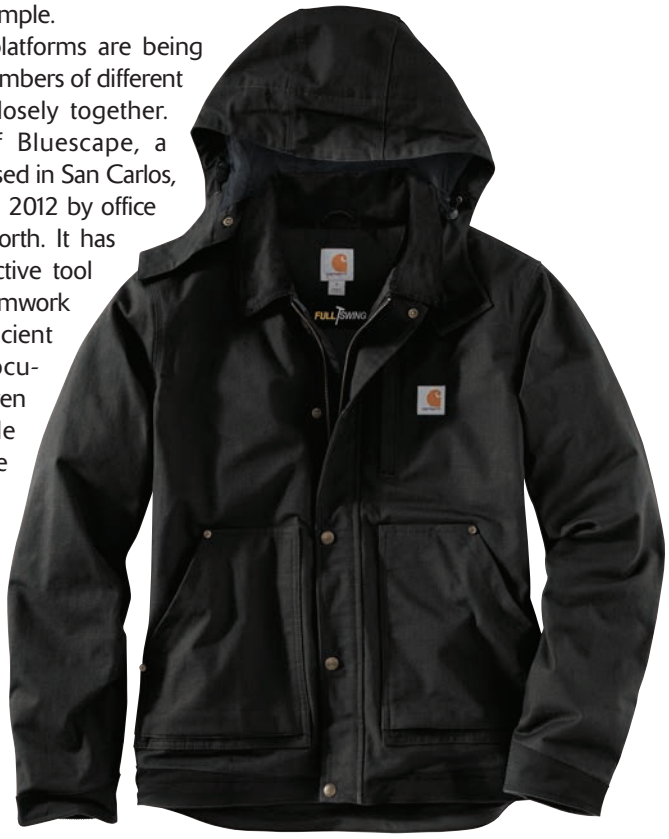
A supplier of antimicrobial silver-based additives, Swedish company Polygiene, conducts numerous market studies to keep a tab on changing consumer attitudes with regards to hygiene and lifestyle. It monitors the attitudes of 4,000 consumers in four major markets and across many product categories (from towels to sneakers and sweaters). "We are a business development partner, not just a textile additive supplier," says Mats Georgson, Polygiene's new marketing director, and long-time board member.

Austrian manmade cellulosic fibre producer Lenzing is taking an even more radical approach by seeking to make Tencel not only a strong B2B partner but also a dynamic consumer-facing brand. By focusing on a single trademark, quietly removing modal from its labelling programmes, the fibre producer believes it can optimise its marketing strategy and better address evolving consumer needs.

New platforms

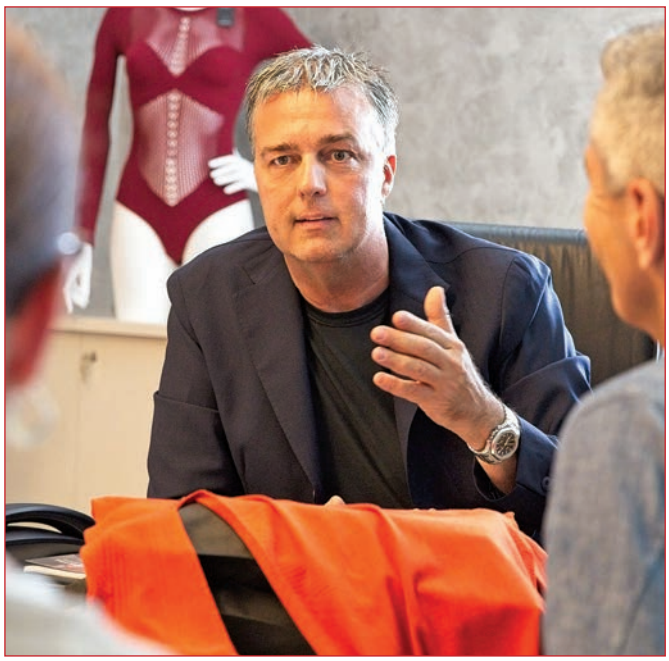
These deeper partnerships and collaborative work methods call on the networking and sharing abilities of new technologies. Cordura works closely with a wide array of mills to develop new products using the high-tech 6,6 nylon. "Insight and collaboration are increasingly important to bring an idea to life," says Cindy McNaull, global brand and marketing director for Cordura. Partnerships now go deeper, she says, "we are often working with different departments within a company and this means that everyone needs to be aligned so that we can better close the gaps in the market." This includes integrating the voice of the consumer into the product development process, which she says has led to novel products made by women's workwear brand Dovetail and Carhartt. A recent collaborative project between Cordura and Carhartt Crew to create the 'ideal pant solution' called on a crowd-sourcing platform connecting carpenters, roofers, aircraft and diesel mechanics, landscapers and engineers to the brand's design team. Insight of this kind could even lead to the development of new fibres, says Ms McNaull, citing the T420HT staple fibre as an example.

Digital tools and platforms are being developed to help members of different teams work more closely together. This is the goal of Bluescape, a software company based in San Carlos, California, founded in 2012 by office furniture maker Haworth. It has developed an interactive tool designed to make teamwork easier and more efficient by bringing all documents related to a given project to a single virtual workspace accessible to all team



Crowd-sourcing tools were used by Cordura and Carhartt to identify new features and address unmet needs in the workwear brand's Full Swing Steel line.

Carhartt



Cesare Citterio, owner and CEO of Cifra SpA, has been focusing on seamless warp knitting for the past 20 years developing technologies that allow mass customisation and produce little waste.

Polygiene and Particle Fever4

members across different devices. Presentations, spreadsheets, images, sketches, annotated images, all versions of a design project, including data in all forms can be grouped together for a more fluid flow of ideas and information. "Bluescape allows teams to follow the design process at all times," says account executive Tim Doyle. "It reduces the risk of information getting lost in translation." He says film studios are big users of the digital platform, as well as sports brands, including New Balance and Olukai. A brand can reduce its design process from 18 to 12 months using this system, he says.

IoClothes is another type of platform which has been launched to assist companies and designers working in smart clothing, shoes and textiles. Founded in 2017 by Ben Cooper, formerly of VF's Innovation Centre, it is designed to "bridge the gap between technology and textiles" as well as "facilitate collaboration and accelerate innovation in apparel, footwear and textiles". Mr Cooper hopes that a neutral third-party site will encourage the flow of information and enable members to find industrial partners, source components, build a network and share experiences. Based in New York City, the "LinkedIn for smart clothing" has attracted 370 members in its 18 months of existence.

Mr Cooper believes that the development of smart clothes warrants the creation of new business models. "Companies are making some very promising and innovative concepts but then they bring it to market in a traditional manner." This, he says, is a "recipe for disaster", the textile industry is "thinking too small and selling far too short".

These new platforms and networks could help bring innovation to market faster and more efficiently. As the need for flexibility and tailor-made solutions continues to grow, the textile and clothing industry may also need to innovate in its collaborative and work processes to invent the supply chain of the future.