

TECH

THE SHAPE OF THINGS TO COME

The new face of beauty

Cosmetic giants are turning to the world of tech to give the beauty industry a makeover, from skin monitoring apps to personalised shampoo. **Hannah Hudson** reports

How far would you go in pursuit of beauty? If you'd been an early adopter in the 1930s, you might have gone as far as the Beauty Micrometer, a whizzy invention by a certain Mr Max Factor, designed to help identify the areas of your face that could be enhanced or 'camouflaged' by makeup.

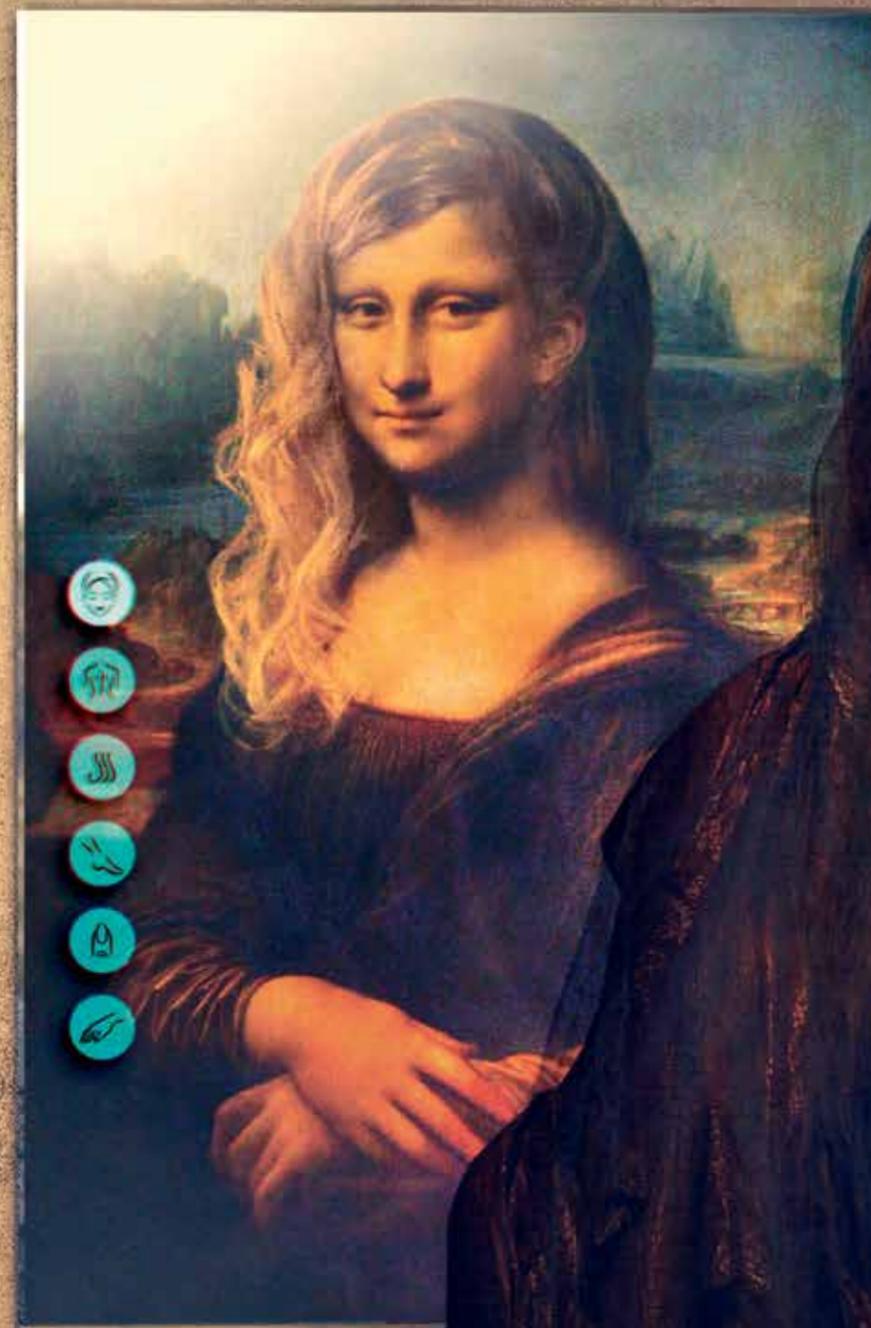
"Resembling a baseball mask, the device fits over the head and face with flexible metal strips which conform closely to the various features," explained a science magazine of the time. "[These strips are] held in place by set screws, allowing for 325 possible adjustments. If, for instance, the subject's nose is slightly crooked, the flaw is promptly detected by the instrument and corrective makeup is applied by an experienced operator."

Designed primarily for Hollywood actresses, surprisingly it never quite caught

on. Since then, other innovative beauty gadgets brought to market have included the Dimple Machine (a face-fitting spring that pressed two small knobs into the cheeks, intended to create a 'fine set of dimples'), the Glamour Bonnet (which claimed to improve your complexion by vacuuming out the air – somehow without suffocating the user) and the Electric Facial Mask (a *Silence of the Lambs*-esque piece of kit that vibrated your face in order to ward off wrinkles). None achieved mainstream success.

But these days the relationship between beauty and technology is beginning to deliver some major developments, as the so-called 'beautytech' sector attracts investment from major beauty brands.

"When it comes to beauty, technology is the new black – it's the chicest, simplest answer to vexing beauty problems," says



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MINS

Kit Yarrow, consumer research psychologist and author of *Decoding the New Consumer Mind*. "The stunning advancements that technology has brought to other areas of our lives – from getting around, to managing boredom, to finding answers – have elevated its stature to the point where consumers are now looking to technology to solve beauty problems, too."

"Beautytech is the inevitable evolution," agrees Lan Vu, founder and CEO of BeautyStreams, an online service analysing trends in the beauty and cosmetics industry. "Beauty and technology are both built on constant innovation and change, so the pairing of the two worlds is a natural match. Technology presents endless, creative possibilities for applications in the beauty world, while the beauty industry, a sector based on feelings and people, brings a touch of humanism to the tech industry."

Last year saw the launch of Silicon Valley's first fully immersive beautytech acceleration programme. Run by igniteXL and Draper University, SV BeautyTech is supporting ten early-stage startups.

"Traditionally Silicon Valley was about 'tech bros' innovating for like-minded 'bros' because they understood their users," says Claire Chang, founder and MD of igniteXL. "What's exciting about beautytech – and why we're thrilled about SV BeautyTech – is that we are well positioned to support women entrepreneurs who understand their users and their unmet needs."

She notes that the accelerator isn't for startups creating new beauty technologies, but rather for those that are incorporating innovations from existing markets – such as biotech, machine learning and artificial intelligence. This distinction is a key factor of the beautytech landscape. With the global cosmetics industry worth approximately £354bn, which technologies are set to shape its future?

SMARTER SHOPPING

Shopping for cosmetics is set to become easier than ever, thanks to clever tech applications infiltrating the buying process. In March this year, L'Oréal announced its acquisition of ModiFace, a Canadian tech company that creates AR and AI technologies for the beauty industry. The tech uses live video to track facial features such as eyes and lips and then, based on those features, renders different makeup, hair or skin effects.

L'Oréal says ModiFace will be part of its Digital Services Factory – "a dedicated network

New faces
Claire Chang of igniteXL. Below Benefit's brow try-on app; Neutrogena's Skin Scanner



to design and develop new digital services for the group's brands". ModiFace employs nearly 70 engineers, researchers and scientists who have submitted more than 200 scientific publications and registered more than 30 patents.

But L'Oréal isn't the only one investing in AR. Tom Ford Beauty, a subsidiary of Estée Lauder, last year launched a 1,400-square-foot standalone beauty store in London's Covent Garden, featuring a host of tech innovations. In addition to exploring an interactive scenting installation (for sampling perfumes), you can even book a makeup lesson where your masterclass is filmed from a digital mirror and emailed to you in chapters, so you can watch and recreate in the comfort of your own home.

And other major companies are getting in on the act. Earlier this year, multinational luxury goods conglomerate LVMH launched its own accelerator programme dedicated to startups innovating in the luxury industry. One of its 50-strong cohort is MemoMi, the creator and patent holder of the MemoryMirror, an award-winning digital mirror platform revolutionising the way people shop. Through AI, VR and AR, customers can virtually try on makeup in real time.

A version of this technology can be seen in action at LVMH-owned Benefit. A 'Brow Try-On' tool allows you to virtually try on different brow shapes using the camera on your smartphone, a desktop or in-store. Select the thickness, definition and placement of your brows (yes, those are all important considerations), then, once decided, you're presented with a list of recommended products for getting the look.

"Shoppers are starting to view in-store technological assistance as an extension of themselves rather than an extension of the sales experience," says Kit Yarrow. Research shows that 67 per cent of US beauty buyers aged 18-22 prefer to search for product information in store on their mobile device than ask a sales assistant.

A CONTEXTUALISED REFLECTION

But why stop at simply admiring your own enhanced reflection? Why not ask for feedback at the same time? The future includes an increasing number of devices that will give you real-time feedback on every aspect of your appearance.

While smart mirrors (those that let you view the weather, watch television and check the time while preening) aren't exactly new, companies are developing products that go one step further. Taiwanese startup HiMirror, for example, has a built-in camera that analyses your skin – tracking your wrinkles, dark spots, pores and dark circles – then giving you related skincare recommendations.

And it's not just about makeup. Skincare is a big driver of beautytech, with many brands bringing into the home the diagnostics previously reserved for pricey dermatologist appointments. In the UK, product design firm Cambridge Consultants launched its Skintuition skin diagnostics platform earlier this year as a low-cost way of optimising your image for analysis.

Users take a selfie using a smartphone, aided by a ring of detachable LEDs, before the app analyses their skin in up to 12 different colours simultaneously, including UV and infrared. By embedding the platform into a commercial product such as a bathroom mirror, Skintuition says it can gather regular images of your skin and alert you to changes in its condition via your phone.

The possibilities for this type of technology are exciting. Neutrogena Skin Scanner uses a similar ultra-magnifying lens with built-in LED lights and sensors that fits over the top of your phone. The accompanying app allows you to keep track of your skin's moisture level and offers product recommendations for your skin type. And L'Oréal offers a way for consumers to be sun-safe with its UV Sense, a battery free circular stick-on that fits on your thumb and connects to an app to let you track exposure.

"This type of technology allows people to have a consultation and gain an idea of how

they can improve their appearance without feeling judged by a third party," says Dr Dimitrios Tsvirikos, a London-based consumer and business psychologist.

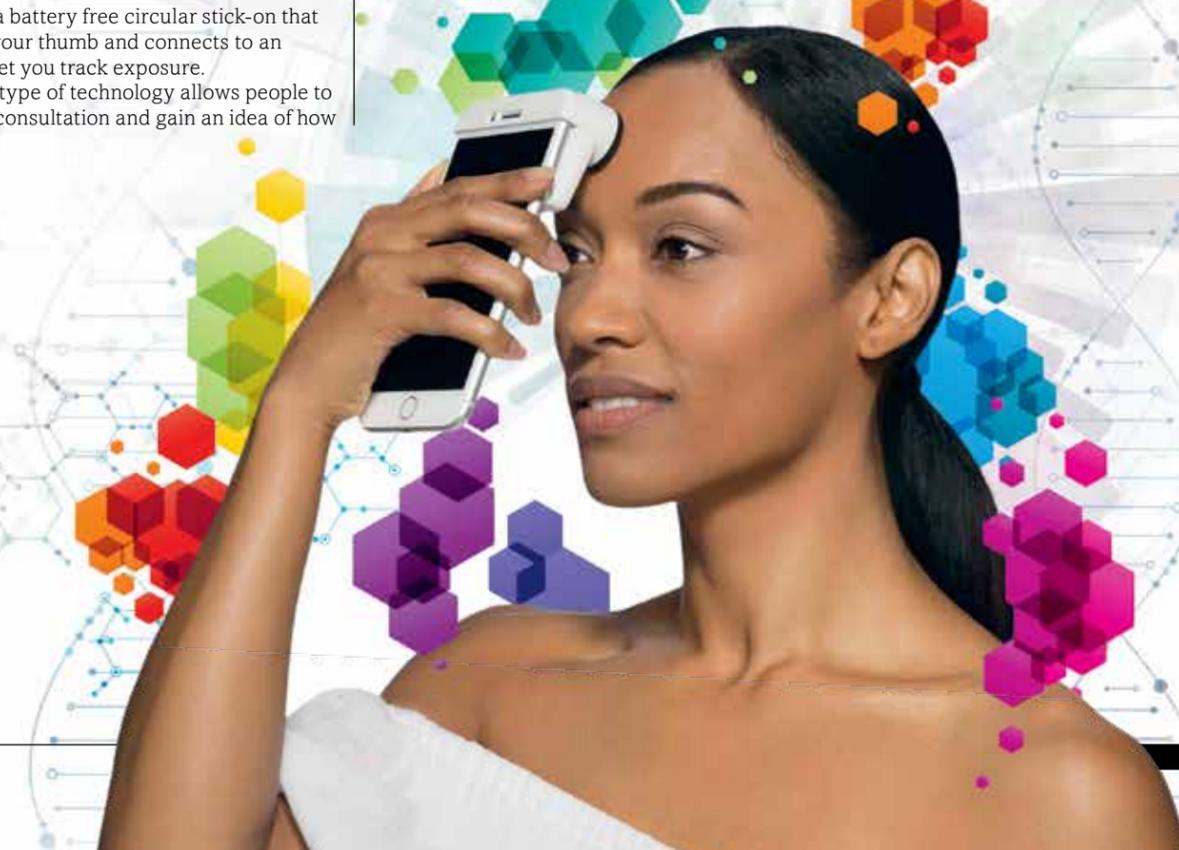
"While we may be comfortable talking to another person about, say, getting a facial, we're less keen to talk about our darker insecurities – wrinkles, looking tired, ageing. We're more comfortable with a non-judgemental interaction about products and facilities."

TECH THAT CHATS BACK

L'Oréal recently partnered with Facebook to launch Beauty Gifter, a beauty service for the platform's Messenger service. This 'intelligent beauty product discovery robot' is designed to help users find the right gift for friends based on a few questions, including budget and preferences.

Coty has launched a visual 'skill' (a version of an app) for Amazon Echo Show. 'Let's Get Ready' provides visual how-to guides and quick makeup application tips,

An increasing number of devices will give real-time feedback on every aspect of your appearance



along with recommended hero products from Coty's brand portfolio. Programmed with more than 2,000 unique combinations of hair, eye and skin colour, as well as event type, it works by basing its recommendations on a person's unique attributes. Users can add products from each look directly to their Alexa shopping list, and even sync the skill with their Facebook calendar to proactively suggest looks for upcoming events.

DATA AND PERSONALISATION

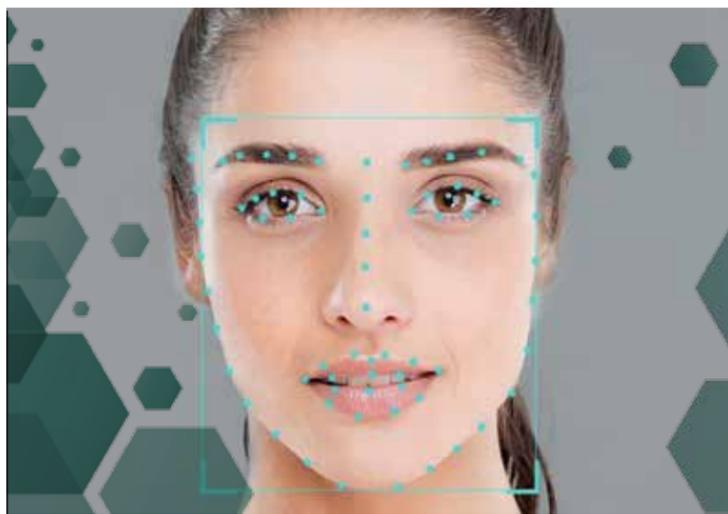
Clearly we're on a path to ever-more customisation and personalisation. Next we won't just want product recommendations – we'll want something tailored to us. In late 2017, Shiseido acquired Giaran, an AI company whose technology is being used to create virtual makeup try-ons, tutorials and personalised recommendations. The company has said it will use the data to inform its own product development.

Interestingly, trend forecaster WGSN predicts that we will continue to give our data willingly in return for useful beauty services. This is true even for our most personal information – our DNA. Beauty startup Skinshift uses a customer's DNA to test for 16 genetic markers in five categories, including firmness and elasticity, wrinkling, sun damage, pigmentation and free radical damage.

"Consumers do indeed weigh the benefits and risks of providing personal data in exchange for insights and service – and it's often seen as a fair exchange," says Kit Yarrow.

MACHINE LEARNING

Of course, all this data requires analysis and action by someone – or something. Enter machine learning and automated product creation. According to The Future Laboratory's Beauty Futures 2018 report, startups such as Proven are



Counter intelligence
Shiseido has bought Giaran to advance AI innovation
Below: Coty's 'Let's Get Ready' project for Amazon Echo Show

using deep learning algorithms to filter through eight million skincare product reviews, 20,000 ingredients and 100,000 products in order to identify patterns and trends to determine the right skincare products for different skin types.

"The average person spends between 45 minutes and 1.5 hours researching products before they buy any beauty products," says Proven founder Ming S Zhao. "And even after they buy based on the research that they're able to do, 55 per cent of people are still unsatisfied post-purchase."

AI could be the technology that ultimately empowers consumers. "Imagine the possibilities of combining AI with AR," says Phil Cullum-Kenyon, head of analytics, health and beauty at Nielsen. "On the simplest level, if you frequently use an AR-enabled mirror to virtually try on pink lipsticks, the technology will quickly realise that pink is your colour – and will start recommending other similar shades you might like."

Leading the charge in AI-enabled micro-personalisation is New York-based startup Function of Beauty. Created by an MIT graduate with a PhD in computer science, it quizzes users on their hair type, texture and traits, and uses machine learning to refine a customised shampoo and conditioner based on what others with similar characteristics have used and found effective.

Another MIT-based start-up, Atolla Skin Lab, gathers skin data from an individual in person – such as moisture levels, oil levels and lifestyle factors – and feeds it into its machine learning algorithm to create customised facial oils. It then monitors the efficacy of the products over time and tweaks the formulas accordingly.

And this is just the beginning. "In the future, AI could power our entire personal health and beauty regime," says Lan Vu. "Everything from controlling the lighting

"In the future, AI could power our entire personal health and beauty regime"



Cabinet reshuffle
Function of Beauty creates personalised hair care

and temperature in the house in order to beautify our skin tone, to creating health and beauty treatments based on daily scans of our skin and urine, to controlling robots who perform plastic surgery."

ALGORITHMIC BEAUTY

On the one hand, the future according to beautytech is exciting and progressive, offering a personalised and bespoke vision that caters to the needs of the individual as never before.

"Beautytech is broadening the definition of 'beauty' by highlighting the segments of population who were for a long time ignored and not included," says Claire Chang. "It's creating a much more inclusive future – one in which there isn't a single 'look' defined by big brands."

On the other hand, there are some who worry that beautytech is taking society down a path not of natural, inclusive beauty, but rather of perfection and flawlessness. Are digital tools – objective and non-judgemental, yet unceasing with their suggestions for 'improvement' – altering

our perception of beauty? Maybe.

Coining the term 'selfie-awareness', The Future Laboratory suggests that our relationship with our self-perceived beauty has been irrevocably altered by the arrival of the selfie. Whereas before, we had to be in front of a mirror in order to assess our appearance, the prevalence of smartphones and social media means we're contemplating the image we present to the wider world more of the time.

Looking good for a photo is becoming seen as just as important – if not more so – than how we look in real life. Nowhere is this demonstrated more clearly than by online makeup influencers, whose faces – shaded cheekbones, narrow noses and plumped lips – are flawless and airbrushed online, but appear cartoonish in person.

Experts predict this could have an impact on the way we perceive beauty altogether, as we increasingly rely on inanimate objects to tell us what our face needs. As The Future Laboratory report says: "[Not only is] social media helping to perpetuate this ideal, [but] as beauty brands increasingly embed technology into their offering, whether it be machine learning apps or connected beauty devices, we will increasingly assess beauty standards not in subjective terms, but objective ones."

It's already beginning: 55 per cent of plastic surgeons have patients who listed looking better in selfies as a motivation for a procedure.

"Consumer perception of beauty is currently full of contradictions," says Kit Yarrow. "While there's a movement toward inclusiveness and an appreciation for a wider definition of beauty, there's also a tech-enhanced, Photoshopped, overly staged and hyper-superficial side of beauty with more emphasis than ever on perfection. Either way, there's no denying that our online lives have created more superficiality and increased the importance of appearances." ■

MODERN BEAUTY TECH: GIMMICKS OR FUTURE CLASSICS?

While the micrometer may have been confined to the dustbin of history, 2018 has produced a host of innovations using technology in creative ways

SMASHBOX 3D LIP PRINTER

Available in selected Smashbox stores, this 3D machine (right) prints a customised lip colour before your eyes.

ROMY PARIS FIGURE LAB

A Nespresso-like machine that makes fresh face cream and serum each day depending on your skin needs. Choose the ingredients and get pressing.

NEUTROGENA LIGHT THERAPY ACNE MASK

Combining red and blue lights and a Man in the Iron Mask-style face covering, it combats bacteria and inflammation – two of the main factors that contribute to acne.

PREEMADONNA NAILBOT

Select a photo, design or emoji on your phone, slot it into the device and the smartphone nail art printer prints it directly onto your nails in five seconds.

