

FJORD™

Design and Innovation from
Accenture Interactive

Accenture Interactive

Read the Fjord Trends 2020 on
[Accenture.com/Fjordtrends2020](https://www.accenture.com/fjordtrends2020)

For a deeper dive visit
trends.fjordnet.com



1 Many faces of growth ⁷

2 Money changers ²¹

3 Walking barcodes ³⁵

4 Liquid people ⁴⁹

5 Designing intelligence ⁶³

6 Digital doubles ⁷⁵

7 Life-centered design ⁸⁹

PREVIEW 2020

Meta-trend:

Realigning the fundamentals

Every year, Fjord – Accenture Interactive’s design and innovation practice – crowdsources trends for the year ahead from its network of 1,200 people in 33 studios worldwide. With new studios opening in Japan and across Latin America, this year’s Fjord Trends are our most globally diverse. Yet, despite the diversity of regional flavors and context, there was a high level of consensus in our initial idea-gathering stage. These are also our most closely connected trends ever, telling a comprehensive story about our landscape and what’s coming next.

Economics and politics, capitalism and resources, technology and society have long been entwined, but recently the consequences of that entanglement have burst into public consciousness – ironically, driven by the very technologies that made such interconnectivity possible. The omnipresence of digital and the internet have been big (possibly decisive) factors in the prominence of President Trump and Greta Thunberg, of Amazon.com and the gig economy, smartphones and techlash and, indeed, the re-evaluation of Silicon Valley start-ups triggered by the failure of WeWork’s IPO.

Questions about capitalism’s trajectory of endless growth with profit as the sole metric have moved from shouting on the streets to conversations in the boardroom. Concerns about plastic have developed into a major climate crisis movement, which is now among voters’ top priorities in many countries. The clash between the technology industry and governments is causing widely felt tremors, as tech giants are considered to have immense power but there’s disagreement about who should be held accountable.

Two years ago, we highlighted *Tensions* as our meta-trend. In retrospect, that led directly to last year’s meta-trend, *The search for value*. Now, that search has evolved into a re-evaluation of purpose and place in the world by governments, businesses and individuals alike.

Meanwhile, technology continues to create change: now, it’s changing the shape of money, recognizing our bodies as a form of signature, and creating virtual doubles.

2020’s meta-trend is nothing short of a major realignment of the fundamentals. It’s tempting to misinterpret this as a gloomy picture – instead, we think this is a once-in-a-lifetime chance to innovate in business models, services and products around new definitions of value.

For companies with the courage to recognize this meta-trend, there are many opportunities – and there will also be challenges. For example, it questions the decades-old definition we’ve had of business success, which is underpinned by the philosophy of profit as the only directive.

This realignment also potentially leads to iconic innovation moving beyond start-ups in favor of more traditional businesses that will need to work together to make change happen at an industry-wide level. We might see a two-speed model emerging as the shift takes place at different paces in different markets. Emerging markets might just leapfrog western attitudes toward endless consumption and go straight for a more balanced view. Meanwhile, people continue to be ever more fluid in their behaviors, constantly shifting between traditional demographic segments in ways that seem contradictory.

However it plays out from here, one thing is likely: those who embrace the long-term view – by starting with their impact on the world and society, and embracing the systemic complexity of the world – will emerge as winners.

Trend 1

Many faces of growth

For decades, companies have been singular in their aim: financial growth – and the faster the better. Now, investors and customers are pushing to evaluate activities against other measures of growth as well, perhaps through environmental, social or governance metrics. It's easy to assume that this is all about profit-bashing, but it's not – this is a positive call to redefine growth in new ways that enhance our lives. If financial growth is no longer an organization's sole business objective, what are the others? And how do we pursue them without losing sight of the fact that profit is ultimately essential for organizational longevity? If we can resolve that tension, the redefinition of growth offers an epoch-changing opportunity to imagine new ways we can create and celebrate value.

Support employees emotional

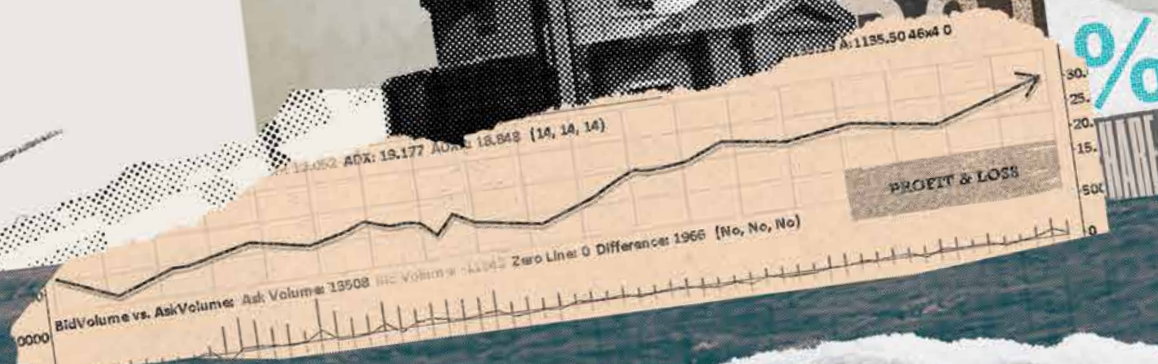
NEW METRICS

HUMAN-CENTERED SYSTEMS

emotional wellbeing provided

ACCESSIBILITY AND TRANSPARENCY

MEETING CONSUMER NEEDS



What's going on?

People power

Investors, customers and employees are urging organizations to reconsider their view of the world and scrutinize their place in it. Unsettled by changing societal values, climate change and depleting natural resources, and economic and political instability, people are starting to question long-held beliefs – including the notion that growth at any cost is acceptable. As a result, capitalism is having a mid-life crisis.

At the heart of the *Many faces of growth* trend is people power. People are fueling demands for change at a time when the wealth gap between the highest income population and everyone else is the widest it's been since the 1930s. Those in the top 40 percent now have, on average, ten times as much wealth as the bottom 60 percent – up from six times in 1980.

The good news is that those with the influence to change how we go about growth are listening and talking about the subject. Business Roundtable, (an influential association of nearly 200 CEOs from North America's most prominent companies), recently redefined its mission, marking a major turning point. For years, its formal statement of corporate purpose put shareholders first. As of August 2019, its new purpose champions activities such as “value for customers”, “investing in employees” and fostering “diversity and inclusion” before shareholders even get a mention.

“People are asking fundamental questions about how well capitalism is serving society,” said Business Roundtable Corporate Governance Committee Chair and CEO of Johnson & Johnson Alex Gorsky. Ex-Unilever boss Paul Polman and Salesforce Chairman and CEO Marc Benioff have also spoken publicly on this subject recently.

Greta Thunberg is leading her generation in a push to heal and protect the planet for today's children and the generations that follow them.



**CAPITALISM.
TIME FOR A
RESET.**

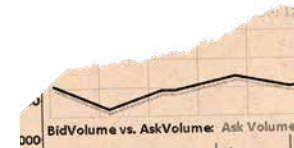
Business must make a profit but should serve a purpose too.

Visit [FT.com/newagenda](https://www.ft.com/newagenda)

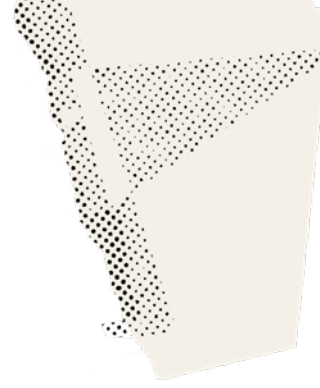
FT
FINANCIAL
TIMES

THE NEW AGENDA

The Financial Times launched The New Agenda in September 2019 to help businesses understand the new era of capitalism, which balances financial growth with wider definitions of success.



“It’s time for a new capitalism – a more fair, equal and sustainable capitalism that actually works for everyone, and where businesses don’t just take from society, but truly give back and have a positive impact.” — Marc Benioff, CEO Salesforce

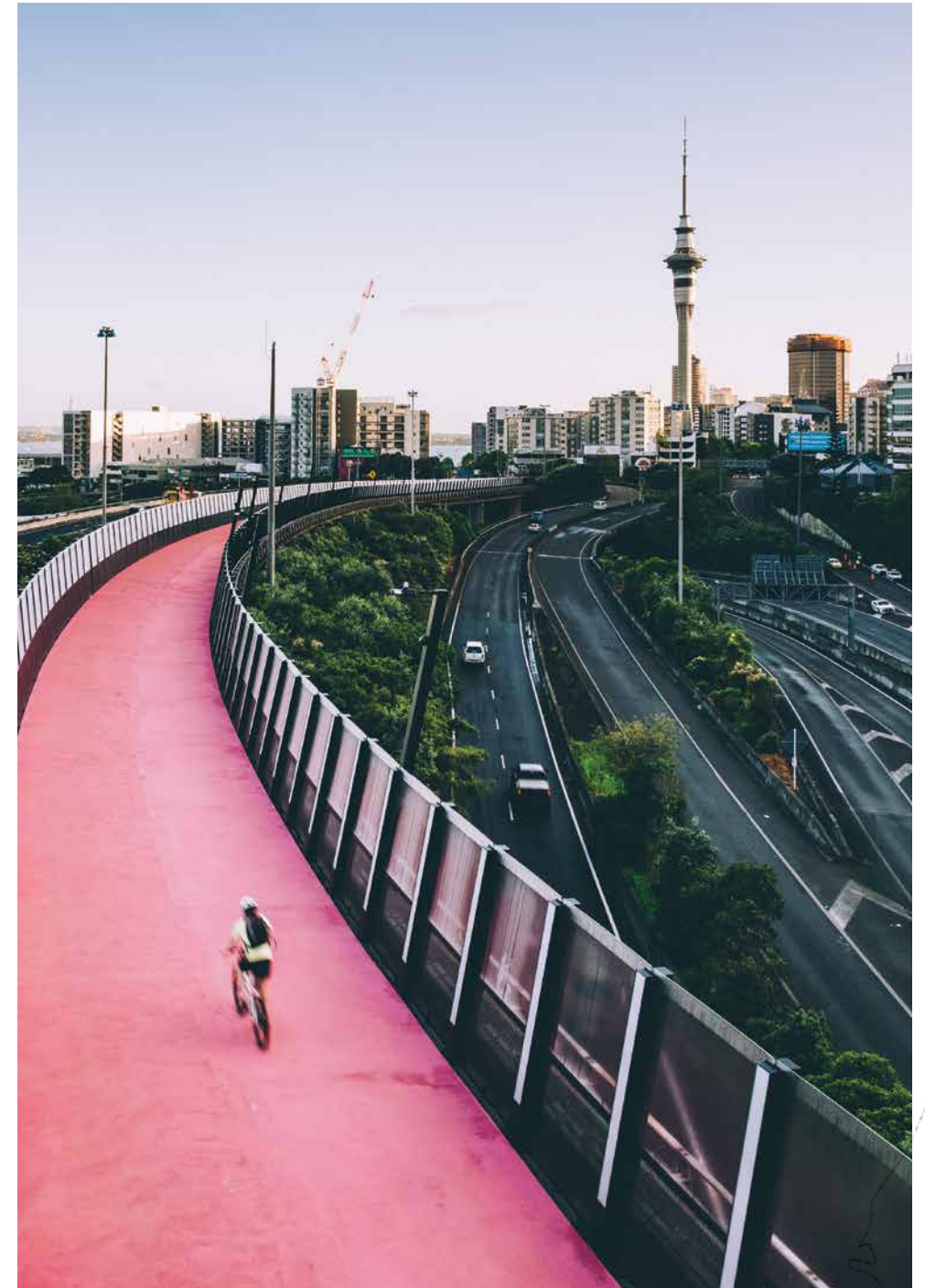


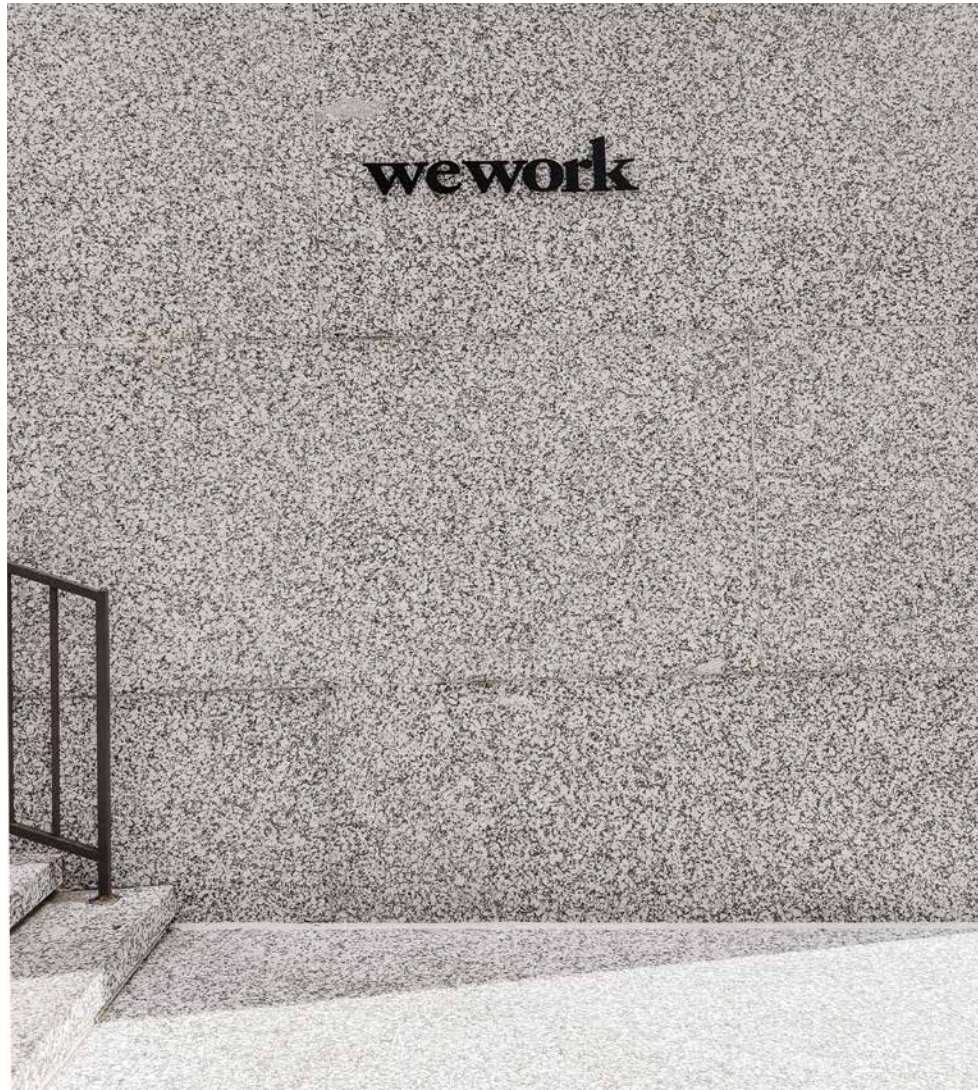
Benioff observed: “We can no longer wash our hands of our responsibility for what people do with our products. Yes, profits are important, but so is society. It’s time for a new capitalism – a more fair, equal and sustainable capitalism that actually works for everyone and where businesses, including tech companies, don’t just take from society but truly give back and have a positive impact.”

In September 2019, the Financial Times introduced The New Agenda. “The long-term health of free enterprise capitalism will depend on delivering profit with purpose,” it stated. “Companies will come to understand that this combination serves their self-interest as well as their customers and employees. Without change, the prescription risks being far more painful.” A month later, BlackRock confirmed a global partnership with the Ellen MacArthur Foundation to launch its first circular economy fund – a powerful signal from the world’s largest asset management firm to other companies and investors.

The calls are coming from both inside and outside the house – investors, employees and customers are making their voices heard. People are demanding their employers be more purposeful and ethical, or else they’ll strike or leave. Amazon staff, for example, recently staged a walk-out to show the company exactly how they feel about its failure to act on climate change. Swedish climate change activist Greta Thunberg is inspiring school children to fight for their futures. Along with 15 other young people, she recently filed a potentially world-changing complaint to the United Nations to have climate change classified as a children’s rights crisis.

New Zealand has allocated budget to causes including mental health services, reducing child poverty, supporting Maori aspirations and modernizing hospitals in a bid to make the country a great place to live and work.





Valued at US\$47 billion in August 2019, WeWork abandoned its IPO in September due to a lack of enthusiasm from potential investors.

Customers, meanwhile, are starting to demand a different set of values from the organizations with which they choose to engage. According to a recent survey, over 70 percent of adults now feel public companies should be mission-driven as well as focused on shareholders and customers. The same study found that as many Americans believe a company's primary reason to exist should include making the world better as those who say it should include making money for shareholders (64 percent). A significant proportion of younger people have turned their backs on capitalism – in a 2016 Harvard study, 51 percent of 18-29-year-olds in the US stated they didn't support capitalism.

There's an interesting signal coming from public markets which are becoming more skeptical of some over-ambitious tech start-ups painting persuasive pictures of growth that don't always translate to business success. Uber went public in May 2019 but, by September, it was trading 30 percent below its IPO price, and its rival Lyft had slipped more than 40 percent in just six months. The same week that the smart bike business Peloton took a 10 percent tumble on its first day of trading, Airbnb decided it likely wouldn't risk listing until 2020.

The most powerful illustration of this, however, came with the collapse of the WeWork IPO in September. Its US\$47 billion valuation had already been widely questioned – and even dismissed as “insane” by Scott Galloway, Professor of Marketing at NYU Stern School of Business – when the IPO was officially pulled after the company's valuation dropped by more than US\$30 billion in a matter of days.

Meanwhile, a growing number of organizations are already making important business decisions that point toward a more balanced view of what growth should mean, and lay the foundation for future gains. Swedish newspaper Dagens ETC banned advertising from fossil fuel firms and Walmart stopped selling ammunition for military-style weapons – two purposeful stands that will inevitably hit their finances but, crucially, improve their standing in the eyes of their employees and the public. Meanwhile, New Zealand unveiled its first “well-being budget” in May 2019: a new economic goal to make the country both a great place to make a living and to make a life.

What's next?

In our Fjord Trends 2018, we predicted *The ethics economy*, which was about organizations increasingly taking a political stance on issues of general concern affecting their business. Our point was that businesses could no longer get by simply with corporate social responsibility. In further developments to that point, we're now seeing organizations reach beyond ethics and even political involvement to ask: how do you include other motivating measures of growth in your operating mentality and still run a dynamic and successful organization? Of course, capitalism without infinite growth is a huge mental challenge – but it isn't impossible.

Imagine that we value – as an everyday objective – employees growing their abilities and increasing their future job prospects. As an employee, the value proposition of a company would be that you would grow as a person in many dimensions (and this would be measured). How attractive would that be to recruits? Imagine that companies were also evaluated on growing stronger ties to the community in which they work. Or that a company's prosperity was no longer measured on its own, but as a part of customer or natural ecosystems.

New definitions of growth will lead naturally to new thinking in meaning and metrics, which might include personal growth performance measures like learning, happiness, communal longevity or good health. Food giant Sodexo, for example, is now factoring in its progress in reducing food waste when calculating its success. We're anticipating a watershed moment when the cost of a product or service is redefined to incorporate sustainability factors (often called externalities) as well as the financial cost of generating it.

According to Professor Mariana Mazzucato, (Founder and Director of the Institute for Innovation and Public Purpose at University College London), in the future, financial institutions might stop evaluating their loans on categories of firms or countries. Instead, they might look at applicants' activities that help fulfil specific missions – such as removing plastic from the ocean. There should be "less picking winners and more picking the willing", she says.

Economic models will also evolve. As Kate Raworth of Oxford University's Environmental Change Institute has pointed out,

the economic diagrams we use shape our models of the world, but poorly designed diagrams have skewed our understanding of how the world actually works. Economic growth was not, at first, intended to signify wellbeing, she has written. Though it aspired to be a 20th century science of human behavior, it was a science based on a flawed portrait of humanity. With its dominant model "rational economic man" more accurately describing the nature of economists than that of other people, an explicit objective got lost, leading to a proxy goal: endless financial growth.

Shareholders will demand environmental, social and corporate governance because, according to Robert Eccles, Visiting Professor of Management Practice at Saïd Business School, University of Oxford, they believe "it's going to drive everything else they care about: growth, market share, and profitability".

The argument that natural resources are finite and that the planet cannot support limitless growth is a compelling one. It's likely to be the major factor that eventually persuades those who question today the need for a redefinition of growth and a shift in how capitalism works. All organizations will need to work out how best to respond. To be clear, this is not a question of sustainability versus profit, but an essential strategy to staying in business. "Companies that don't adapt – including companies in the financial system – will go bankrupt without question. [But] there will be great fortunes made along this path aligned with what society wants," Bank of England Governor Mark Carney recently said.

More growth will come through technology. While materials-based businesses will be constrained by their ability to change quickly, purely digital companies will be able to move faster. For instance, they'll have fewer constraints in their switch to renewables that reduce their energy and resource footprint. While resources become scarcer in the physical world, those in digital worlds are limitless – so long as we have the renewable energy to power them.

Organizations will need to upskill staff at all levels. Accenture published a report assessing CEOs' readiness for achieving UN global sustainability goals. In it, they identified key leadership requirements, including the ability to pioneer profit through purpose – looking beyond near-term profits to align other growth goals with their core business strategy, operations, and investments in innovation and technology over the longer term. A growing number of organizations now seem ready to change. Four in ten Fortune 500 CEOs now agree that solving social problems should be part of their core business strategy.

“The long-term health of free enterprise capitalism will depend on delivering profit with purpose. Companies will come to understand that this combination serves their self-interest as well as their customers and employees.”

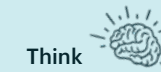
— Financial Times, The New Agenda



Our planet and its finite natural resources cannot support limitless growth, prompting a need to rethink how we use our world and how we can reduce our negative impact.

Fjord suggests

Reimagine how you define and measure growth for different stakeholders.



Think

How will you define new types of value you can deliver while making the profit required to thrive? And how will Customer Experience and Employee Experience work together to create that value at the points of creation and delivery?

Say



Ask your employees what sort of growth they'd like to see in the organization. Get the debate going.

Do



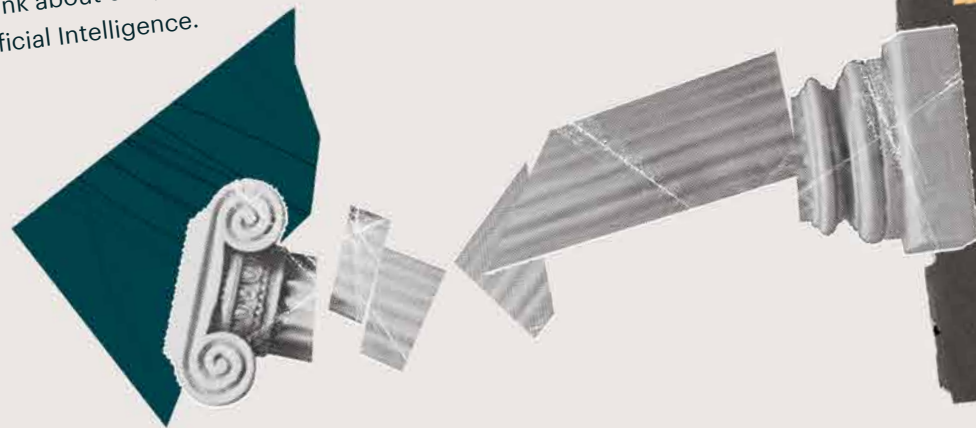
Start to embed new metrics (alongside financial growth) to drive behaviors. What you measure counts. Collaborate with those willing to make change happen at an industrial level, as effective change is easier to commit to if many join the game. How are you set up for different value to be rewarded? How do you motivate people?

Trend 2

Money

changer\$

Our experience of money is changing. This includes how we think of it at a macro scale (what it is) and at the micro (what it can do). The very notion and shape of money is morphing – and so is our perception of it, relationship with it, and thus how we think about paying for things. Once, money was a physical entity – the shift away from that began a long time ago with credit cards. Now, in a new wave of change, it's evolving towards invisible value exchange ecosystems powered by digital – a fundamental shift that enables us to do more than just buy things and opens up a host of new product and service opportunities. In this evolution, money can carry other information with it and represent multiple forms of value that aren't national currencies. At the same time, banks (old and new) are innovating the ways we think about our personal finances not only now, but in our near future, using Artificial Intelligence.



Cashless Society
Fin-tech challenger banks are
BIOMETRIC AUTHENTICATION

What's going on?

Once upon a time, we went into a bank and waited in a queue. Then, we self-served with online and mobile banking. Now, many societies – in Asia, especially – are going cashless. In China, mobile payments are now so common that paying with cash is practically unheard of, even with street performers and taxi drivers. Meanwhile, millions of people in developing countries remain unbanked. New payment ecosystems are being pioneered by non-traditional financial companies, and our relationship with money is being made more ambiguous by seamless or almost invisible systems such as payment by smartphone, payment by facial recognition and cashier-less retail stores. According to CBS News, only 13 percent of Swedish people could remember using cash for a recent purchase and, in the US, 30 percent no longer use cash in a standard week.

Opportunities in global payments are significant, with Accenture estimating that revenue is likely to grow at a compound annual growth rate of 5.5 percent to reach US\$2 trillion over the next six years. Accounting for 58 percent of total revenue, customer payments are expected to grow at 5.1 percent by 2025, and the corporate payments that make up the remaining 42 percent are expected to grow at 6.1 percent. Based on this, US\$500 billion in incremental revenue is now up for grabs.

Trust in legacy banking systems has been challenged, however – among younger people, especially – by scandals and traditional players' failure to adapt fast enough to evolving customer expectations. At a time when payments are becoming increasingly decentralized, start-ups are providing all manner of improved customer experiences which raise expectations and, in turn, place greater pressure on traditional banks. Today, as more services make the business of sending money to individuals and companies instant and free, quality of experience is a critical differentiator.

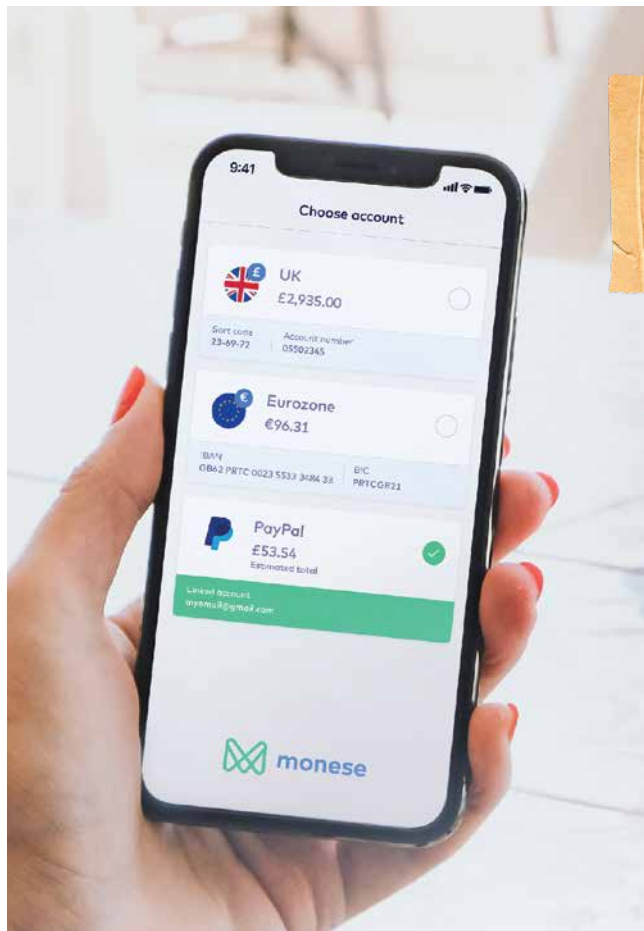
Payment innovation



The new Apple Card aims to reinvent the credit card, eliminating fees, simplifying application and helping people to make financially healthier decisions.

“We face an inevitable world of instant, invisible and free payments, which spells trouble for banks that don’t want to be relegated to the plumbing of payments.”

— Gareth Wilson, head of Accenture’s global payments team



Monese invites people to open a GBP/EUR account using their mobile in minutes, without needing credit checks or proof of address.

There are echoes here of what we’ve already seen in telco – where customer relationships switched from telco service providers to smartphone-makers—and in energy – where a similar relationship transfer has favored smart thermostats such as Nest or aggregators like the UK’s Flipper. When it comes to money, people think less about their bank than payment providers like Apple Pay or Google Pay for security and ease, TransferWise or Revolut for international currency transfer, or a social platform where their friends are.

“We face an inevitable world of instant, invisible and free payments, which spells trouble for banks that don’t want to be relegated to the plumbing of payments,” says Gareth Wilson, head of Accenture’s global payments team.

Today, it’s easier than ever for non-financial companies to play a financial role in their customers’ lives.

M-Pesa is a telecom-based banking service for the unbanked developed in Kenya, now being used from Albania to Afghanistan, and is one of a host of new, non-traditional banking services. Customers top up their balances at a corner store, protect it with a pin, and make payments to anyone set up to receive them – all without a bank account, just a cell phone and a contract with their telecom service provider.

Apple Card is a new kind of credit card with accompanying software that connects to an iPhone user’s Wallet app and can pop up as a default option whenever they use Apple Pay. Its features help people better monitor their finances, enhance the Apple Pay experience and embed people more deeply into the Apple brand so it’s less tempting/more difficult to switch to a competing smartphone provider. UK-based Monzo and Australia’s Xinja and 86 400 are a new breed of neobank innovating ways to help customers better manage their money – and they’re growing, fast. Monese enables people to open GBP and EUR accounts as one, using their mobile without any need for proof of address, and Sweden’s Klarna allows people to buy now, pay later.

Others are exploring the future of new digital currencies. In west Africa, 15 countries recently agreed to adopt a single cryptocurrency, called Eco, in 2020. In China, the government plans to launch its own, state-backed cryptocurrency next year. Meanwhile, Facebook is working on its own global cryptocurrency, Libra, and just announced Facebook Pay.

For now, regulators, governments and potential players are grappling with if and how best to respond to the prospect of digital currencies – and the inevitable concerns they raise about financial stability, customer protection, privacy and potential for criminal activity. For instance, France declared in September that it will block Libra’s development in Europe. A month later, PayPal, Visa and Mastercard withdrew their support. These companies were all founding members of the Libra Association (a Swiss group established by Facebook to govern Libra, comprising technology and finance giants plus Latin American digital wallets Mercado Pago and Xapo).

Central Banks are actively focused on this space and some are progressing with key proof points for Central Bank Digital Currency. In 2019, Accenture worked with the Bank of Canada (BoC) and the Monetary Authority of Singapore (MAS) as they collaborated to conduct the first cross-border and cross-currency payment, using two different DLT platforms and central bank digital currencies.

New digital currencies will come. When they do, we will no longer think in terms of transferring dollars or euros or the hassle of converting them across borders – instead, we will think in terms of sending “value” as easily as we send a photo online. Our relationship with money will become even more abstract and our transactional experience will become absorbed into social interactions. This might mean that you can effortlessly add “value” (like an emoji) to a photograph you share with a family member on social media – this could be a payment but also might be a Deliveroo voucher.

For now, the majority of payment systems may still be designed for plastic cards or real-time bank payments. However, our expectations are largely driven by innovation in the digital space, so we’re slowly getting comfortable with paying using our phones – and soon with our faces. As money becomes less visible, it’ll take on different properties, including greater transparency, traceability and highly seamless transactions.



Traditional bank RBS has launched digital bank Bó as an active partner to help people manage their money.

M-Pesa means “mobile money”, and is a transfer, financing and microfinancing service for people who have smartphones but no bank accounts.



What's next?

Money changers is a trend that will impact not just financial institutions or those wanting to become one, but every organization and individual involved in any financial transaction – whether they're retailers, employees or customers. Our mental model of money as something physical – notes in our hand, or coins in a piggy bank – will be replaced by money as traceable, programmable file transfers.

Think of it like music: a long time ago you had to experience music live. Now, it's most frequently experienced as a digital file that contains other information beyond the music itself – the lyrics, the band history, links to gig tickets. The same shift is happening for money. Our assumption of money as a single unit with a single unit price will evolve, too.

Imagine money units with different layers of value on top of unit price. Payments for green products or from companies with advanced social policies, for example, could carry an extra layer of value within its blockchain-enabled history. Or, it could carry increased value for certain groups of people – the equivalent of a membership card discount but baked into the money unit itself. If a person's bank knows their age or status as a student, and can embed this (anonymized) in their money, why should they need to prove these facts when buying travel?

Impact in different markets will be influenced by their local economy contexts. In poorer, struggling economies where money transfer via messaging service is already an alternative to bank services, there will be significant opportunities among “unbanked” populations – an estimated 1.7 billion+ people worldwide. One example of such an initiative is the Bangla-Pesa – a local currency introduced for small business owners in an informal settlement known as Bangladesh in the Kenyan city of Mombasa.

Meanwhile, in more advanced, mid-market economies, we'll see a drive to offer people more help with their finances. A host of players are already doing this, including legacy financial services brands such as RBS in the UK, which recently launched stand-alone digital bank Bó that works with customers to help them “do money better”.

All of this represents a major opportunity for companies to redesign their payment experience and use it as a point of differentiation. Just as transport was disrupted by Uber and retail by the checkout-less stores pioneered by Amazon Go, payment innovation will disrupt whole industries. Common to both companies' success were their efforts to remove the friction of transaction, thereby building new service experiences. Soon, inputting bank account and routing details to make a transfer will seem prehistoric. In the US, Venmo has been leading the way in peer-to-peer social payments for several years.

As it becomes easier than ever for companies to play a financial role in their customers' lives, trust will be key – and it will have to be built through quality of experience. Organizations must ask themselves: what should the role of financial services be at this point, and what will payment innovation look like for their own particular service? In the US, Fjord has been working with a famous charity on the experience for easy street donation. Imagine if each donation left information in your bank account that unlocked discounts on shops near the point of donation?

Over the next few years, change will accelerate. With the help of their built-in biometric capabilities, smartphones and digital watches can already learn to identify their users for authentication with minimal effort. Next, we'll see a significant rise in the use of “biometric mobile wallets” – payment by fingerprints, facial or retina recognition. Mobile biometrics are expected to authenticate US\$2 trillion in in-store and remote transactions in 2023 – 17 times more than the estimated US\$124 billion such transactions in 2018, according to one recent forecast.

Today's young people may even become the first to ditch the leather wallet entirely, in favor of a digital wallet that can think for them – for example, choosing the payment service with the best rewards for savings.

To unlock new opportunities, organizations must earn their customers' trust through great, seamless experiences and demonstrable competence. Every time a bank messes up a customer's experience, they automatically suspect incompetence behind the scenes and their trust erodes. If we change the shape of money, we need products and services that address concerns about privacy, transparency and integrity. We'll also prefer those that meet our particular needs and provide the best possible experiences. This will mean making complex new ideas of money easy to understand and use.



“Today, as more services make the business of sending money to individuals and companies instant and free, quality of experience is a critical differentiator.” — Fjord Trends 2020

ATMs might soon become relics from a bygone era, with many societies starting to go cashless.

Fjord suggests

Reimagine transaction and payment as a source of innovation and competitive advantage.

Think



If your service were a part of money transactions, what would it look like? For example, if every payment carried information about you or your customers, what would that be? How useful could you make it? How will the changing landscape of money affect your business and customers?

Say



Communicate why people can trust your organization. Highlight your customers' trust as an asset you can extend to new financial offerings.

Do



Move to where people are going to manage money, and build on services they already use (i.e. technology like SMS or services like neobanks). Follow these closely and look for new product opportunities around people's money goals.

Trend 3

Walking barcodes



(01)



>[///--- 01110010 01100001 01101001
FOLLOW THE COOKIE TRAIL ---///]<

Interfaces are dissolving, and we're finding new ways for technology to identify both us and features of our behavior. Combined, these factors create amazing opportunities to continue simplifying our everyday life. We've grown comfortable with the idea of leaving digital footprints everywhere we go online (though we might not like it much). Now, facial and body language recognition are becoming widespread, so we're leaving a physical cookie trail everywhere we go in the real world. With 5G right around the corner, there's abundant potential to design new products and services that address the challenges of physical world data collection and content personalization – with real-world solutions and enhanced experiences.

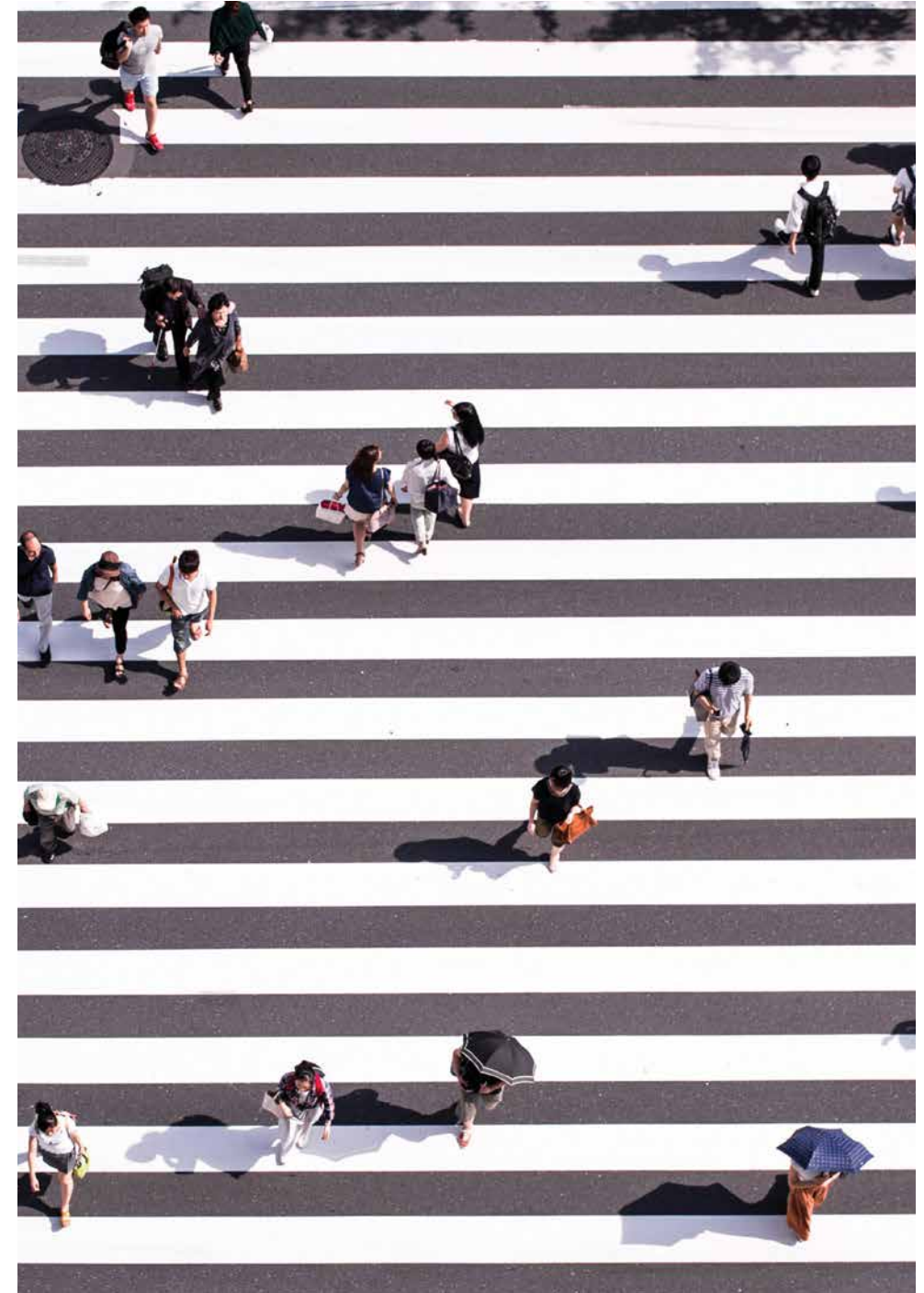
What's going on?

For some time, we've been trackable by the data our online behavior generates. Now, the bleed of technology into the real world means that our physical behavior is also generating trackable data, connecting us to the wider digital ecosystem that monitors our streets. As physical features become machine-readable, The Economist recently noted, our faces can be read like a barcode. Your body becomes a signature.

Already, facial and body language recognition enable seamless interactions such as unlocking things, personalized curation of messages and content, and paying for purchases. In China, Alipay – the financial arm of e-commerce giant Alibaba – has developed “Smile to Pay”, for example. In insurance, Zurich’s FaceQuote lets people get a life insurance quote with just one selfie.

Dissolving interfaces
In entertainment, Disney piloted an interactive movie poster with Accenture Interactive. The AI-powered experience used photography and emotion recognition to enable a poster for the movie Dumbo, which could display a version of the movie poster that corresponded with the expression on the face of the person looking at it.

Governments, too, are taking an interest: India is planning one of the world’s largest facial recognition systems while in China, the authorities are building the world’s most extensive facial recognition database – with the power to identify any one of its 1.3 billion citizens in seconds. In the US, the Pentagon has invested in technology that can identify people at a distance by their heartbeat, which is as unique to them as their iris or fingerprint.



As advanced technology arrives on our streets, our faces and body language will be trackable, enabling personalized experiences in physical environments.



Amazon has added to its Echo range with Echo Loop (a ring) and Echo Frames (glasses), raising privacy concerns.

“5G mobile internet is set to go mainstream in 2020 and generate the majority of global mobile media revenues by 2025.” – Fjord Trends 2020

Inevitably, such developments are raising privacy concerns and, in some cases, innovations can't even get off the ground. In May 2019, San Francisco banned facial recognition technology in response to civil rights advocates. Vimeo's alleged collection and storage of thousands of people's facial biometrics without their knowledge recently prompted a US lawsuit. Meanwhile, concerns raised by an art project critique of ImageNet, (a database of 12 million images and 22,000 visual categories publicly available for research and educational use), forced the firm to remove more than half a million images. Amazon smart products Echo Frames (smart glasses) and Echo Loop (a smart ring to be carried with you at all times that even makes phone calls for you) have also sparked privacy debates.

Amid recent political protests, Hong Kong's government decided to invoke a colonial era emergency law to ban face masks, which would make facial recognition of protesters easier. The decision caused an outcry, as did testing by Chinese schools of headbands designed to monitor pupils' attention levels and feed performance data directly to teachers and parents. Facebook AI Research has now even created the first “de-identification” program for video to make people invisible to facial identification software.

It's not all negative, though. Facial and body language recognition can deliver invaluable new and enhanced services. UK health start-up Babylon combines AI with people's medical expertise to deliver improved access to healthcare – AI initially helps to identify a patient's condition, then assesses their reaction to help gauge whether they fully understand the advice they receive. Recent Facebook acquisition CTRL-Labs is a New York start-up that specializes in allowing people to control computers using their brains.

5G mobile internet is set to go mainstream in 2020 and generate the majority of global mobile media revenues by 2025. Its impact isn't just about faster data connection – while 4G transformed our communication options, 5G's biggest influence will be on how machines function, and that effect will ripple through every facet of modern life.

A drop in delays between devices and networks will create a host of new possibilities. For example, it could enable physical spaces to be augmented with a personalized layer in real time – even incorporating feel or touch – allowing each individual to have their own experience of the same space. A new hospital in Yongin, South Korea, plans to test an AR navigation system and holograms of patients in isolation, to give them a better way to interact with their visitors.

Using contextually relevant mobile data to surface better experiences to people on-the-go will offer significant creative opportunities. Until we start using 5G, though, we probably won't fully appreciate what it can do for our experience as people.

Mischa Dohler, Professor of Wireless Communications at King's College London, is working on creating the Internet of Skills, which will allow for kinetic movements to be sent to other locations. A person wearing an internet-connected glove, for example, could have their movements mimicked in real-time by a robot elsewhere in the world. "We're not able to transmit touch and muscle movement through the internet, but we will with the low latency capabilities of 5G," he says. "We are now starting to build the devices which allow you to execute skills remotely." At Mobile World Congress 2019, exhibitors brought this concept to life by showing how doctors might be able to perform surgeries from a distance.

Pioneering airlines, such as Delta, and airports are introducing biometric scanning to make passengers' experience of air travel faster and more seamless.



What's next?

Personalized content, advertising and experiences now familiar in the digital world will soon become mainstream in physical environments. In our 2018 *Computers have eyes* trend, we highlighted computers' growing ability to "read" images thanks to Artificial Intelligence and Machine Learning, and the digitization of physical spaces was at the heart of our 2019 trend *Space odyssey*. Now, *Walking barcodes* will present new opportunities for space design as the further merging of our digital and physical selves changes how we interact with the world around us.

5G has the potential to allow endless scope to connect things – people, sensors, machines – in new and creative ways. Living services – sophisticated, contextually-aware, digital services – will move from the digital world into the physical world. The Internet of Bodies will be added to the Internet of Things, facilitating new business models such as bundling and more effective advertising. It will supercharge businesses to work in real time, and it will transform industries – for example, annual mobile media revenues are predicted to double in the next ten years to US\$420 billion. Brain-computer interfaces and other devices that blur the lines between mind and machine also have extraordinary potential.

Publicly available video offers rich research material for the design of new services – body language as a passive source for AI diagnosis, for example, or digital phenotyping, (the study of health dynamics using passive social media or smartphone data). However, it also represents a privacy and ethical minefield: significant challenges lie in managing privacy concerns and consent, and dealing with biased or poorly functioning systems. For instance, a system designed to block intoxicated people might mistakenly block those with disabilities that affect their balance or gait.

In today's post-Cambridge Analytica era, public backlash is a serious risk. It's essential to learn from mistakes made in the digital environment when developing new products and services. In particular, privacy concerns and consent must be addressed more seriously as, with biometric data, any hack or security breach risks permanently compromising the individual – you can change a password, but not your fingerprint.

Understanding human behavior will create opportunities and help overcome challenges. Organizations will need to understand how to design opt-out in the real world, how to ethically shape people's activities, and any associated concerns and constraints. In China, use of beauty filters is so common there's a name for it: internet celebrity face. After research showed people felt ugly when scanning their face using facial recognition technology, Alipay added filters to its "Smile to Pay" system.

Though we've been monitored by CCTV for decades, it's been statically and silently embedded, so it hasn't felt intrusive. Once we start interacting with physical environments that can recognize us or personalize to our wants and needs, we'll become more aware that our environment is watching us. Inevitably, this will change how we perceive ourselves and our actions. Imagine the ability to see (and share) a video edit of your day – your best moments at work and at play? And if you think you're starring in your own movie, how will that change your behavior? This may be especially important in the workplace and lead to better but also possibly artificial behaviors.

Though some people will be concerned about being recognized by a public machine, with many smartphone users now comfortable with facial recognition in their hands, it's likely that many will come to accept it – especially when they understand what they'll get in return.

With voice, simple things like asking for the time or the weather helped drive rapid uptake. What will be the equivalent for facial recognition? The world's airports are starting to introduce biometrics in their security checks, including the UK's Gatwick Airport, which recently became the country's first airport to confirm it will permanently use facial recognition cameras for pre-flight ID checks. In China, Chengdu Shuangliu Airport now automatically presents a traveler with up-to-date personalized information when they approach a screen.

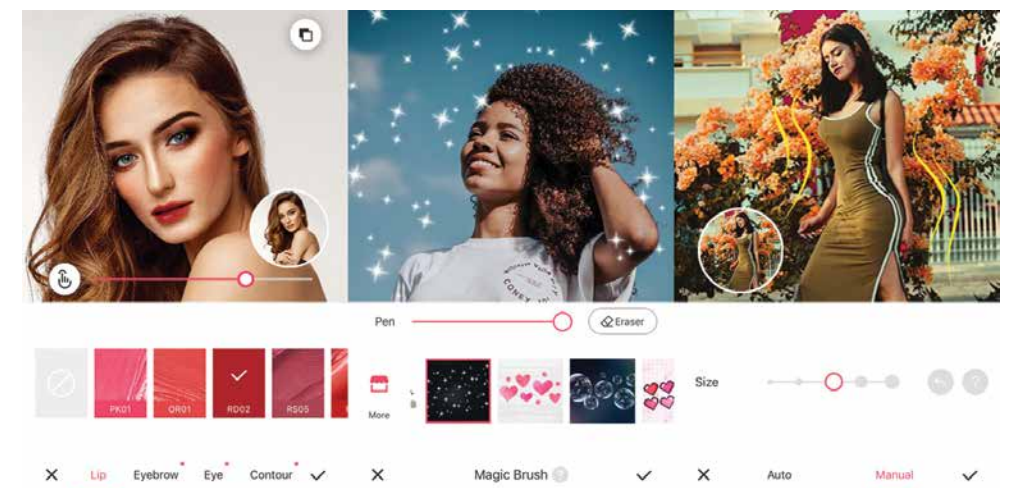
There's growing momentum in self-managed identity solutions that enable people to take control over the information they share, with whom and for how long – including the ability to revoke access. This is the focus of a key initiative at the World

Economic Forum involving a broad public private consortium of experts and stakeholders, focused on the future of good digital identity.

How soon will we use facial recognition to open front doors, gym lockers and then approve ATM cash withdrawals? What can we do with other forms of body recognition? For example, tracking the speed at which the elderly move around their environments, or using machine learning to look for tell-tale signs of frailty.

Capitalizing on *Walking barcodes* will not be easy. Increasingly, we'll live in environments powered by intelligent, automated systems that access our data to learn about our behaviors. As this becomes more common, we'll notice a decline in screen-based interaction, such as via a kiosk, so organizations will need to factor this in when designing services. People will need a tangible indicator that they've handed over some of their information – performing the function of the barcode reader's beep at the store. This could mean re-directing energy toward designing meaningful human moments instead of transactional stop-gaps, and making the invisible handing over of data worthwhile for all people feeding the machine.

Use of beauty filters has become such a popular phenomenon in China, it has a name: "internet celebrity face".





“Now, with facial and body language recognition becoming widespread, we’re leaving a physical cookie trail everywhere we go in the real world.”

— Fjord Trends 2020

As we become used to being scanned like barcodes, how will privacy and trust issues evolve?

Fjord suggests

Reimagine new services
for dissolving interfaces,
enabled by 5G.



Which of your services could be unlocked by biometrics, (in line with regulations and laws in your sector, of course)? What could you do with facial recognition or understanding body language to reduce friction for people? Look at the human experience of these services: Who do they most convenience? How do people consent? How could improved communications between machines – via 5G – create new service opportunities?



Advocate for data minimalism and educate your customers about data consent and privacy – the consequences of data breach in biometrics are much more severe.



Make the invisible visible so people understand when a scan, transaction or consent has taken place. Ensure that people can be the curators of their own personalized experiences – build a platform for people to express, discover, and receive what they want – subject to privacy laws like GDPR.

CONSUMER

UNABLE

BY AIR MAIL
PAR AVION

Living

GUIDE TO
KNOWING YOURSELF

MADE IN CHI



Trend 4

Liquid people

In *Many faces of growth*, we assert that capitalism is having a mid-life crisis, as changing societal values and people-pressure force businesses to rethink their focus on a narrow definition of growth. *Liquid people* is the flipside of the same coin: it's about people's reassessment of themselves, the lives they lead and their impact on the world around them. We're all starting to question what it means to be a customer and an employee. What's beyond consumerism? What's beyond the notion of work simply as a means to make a living?

What's going on?

Something contradictory is happening: we still want to buy, but we're starting to move away from using material objects to define ourselves. We're seeking ways to show who we are without pointing to our possessions and what we do for a living – we're starting to want to be more than that now. We emphasize "starting to" because, of course, we're still eating hamburgers, buying clothes that make us feel good, flying to interesting places, gazing at shiny new products and wondering if we can afford them (and often buying them regardless).

The same is true at work: we're still working hard for companies we may or may not really like, trying to understand our self-worth through what we do many hours a day.

Yet we see signals that this is changing, and consequently, organizations will increasingly need to redefine their understanding of the people they serve and employ, to allow people to find a greater sense of relevance.

Consumption is not dead, but it's changing. For years, we were what we owned, what we drove, what we wore, what we ate. At work and in social settings, we were where we worked and what we did. Those ideas are now challenged – along with other symbols we once used to define our place in the world like nationality, religion, community – because what we buy and why we work have become more fluid. This shift is being driven by a range of factors, including concerns about climate change and a sharper focus on personal wellbeing.

Already, a growing number of people are becoming conscious consumers. They still consume, but they now do so to support a cause and/or do minimal harm to the planet or society. They readily accept the trade-offs between the things they choose to buy or do – no longer sweating about the contradictions

Flexible mindsets



Rising numbers of meat-eaters are choosing meat-free options from vendors like Impossible Foods for ethical and environmental reasons.

“Not only are we increasingly expected to make ‘right’ choices about what we buy or do, we are increasingly likely to be criticized if we don’t.” — Fjord Trends 2020

In Sweden, peer pressure is driving air travel down and rail travel up.



often inherent in this, because what they contribute when they do so is more important. Companies that effectively respond are growing in popularity. Everlane runs a popular Black Friday campaign in which every order prompts a donation to Oceana to help reduce the proliferation of single-use plastics.

Last year, in *The inclusivity paradox* trend, we highlighted the need for organizations to evolve their approach beyond demographic segmentation. Instead, we advocated they focus on meaningful mindsets – an approach that better serves people’s desires in today’s world to be seen and treated appropriately as individuals. Since then, there has been ample evidence of people perceiving and defining their identity and worth in ever more liquid ways. In 2019, gender fluidity went mainstream and by September, Mattel had launched the world’s first gender-neutral doll. Freelance self-employment spiked as people sought the flexibility to make their careers work for their lifestyles.

People have always chosen to spend more on certain items while spending less on others that we consider to be less important. The difference is that now, these trade-offs are becoming more common and visible. For instance, many meat-eaters are happy to forgo meat on weeknights, some sustainable fashion buyers still travel by plane, many global corporate workers run community side projects. Most importantly, we’re open about this. In other words, we’re now looking for a bundle of different values in the things we consume beyond the joy of consumption, status or ownership. The “value add” that marketers have sought for decades is changing shape rapidly and becoming linked to unpredictable but important forms of self-actualization.

Companies are starting to follow this trend, too. Brazilian start-up Beleaf, formerly known as Vegan Já, is one of a number of plant-based food companies around the world to change its name to broaden its appeal to meat-eaters. In the US, around 95 percent of people buying from meat alternative food business Impossible Foods are meat-eaters. Vegan is now the fastest growing food takeaway in the UK, and recent YouGov research suggested a conscious flexitarian diet could soon become the country’s norm.

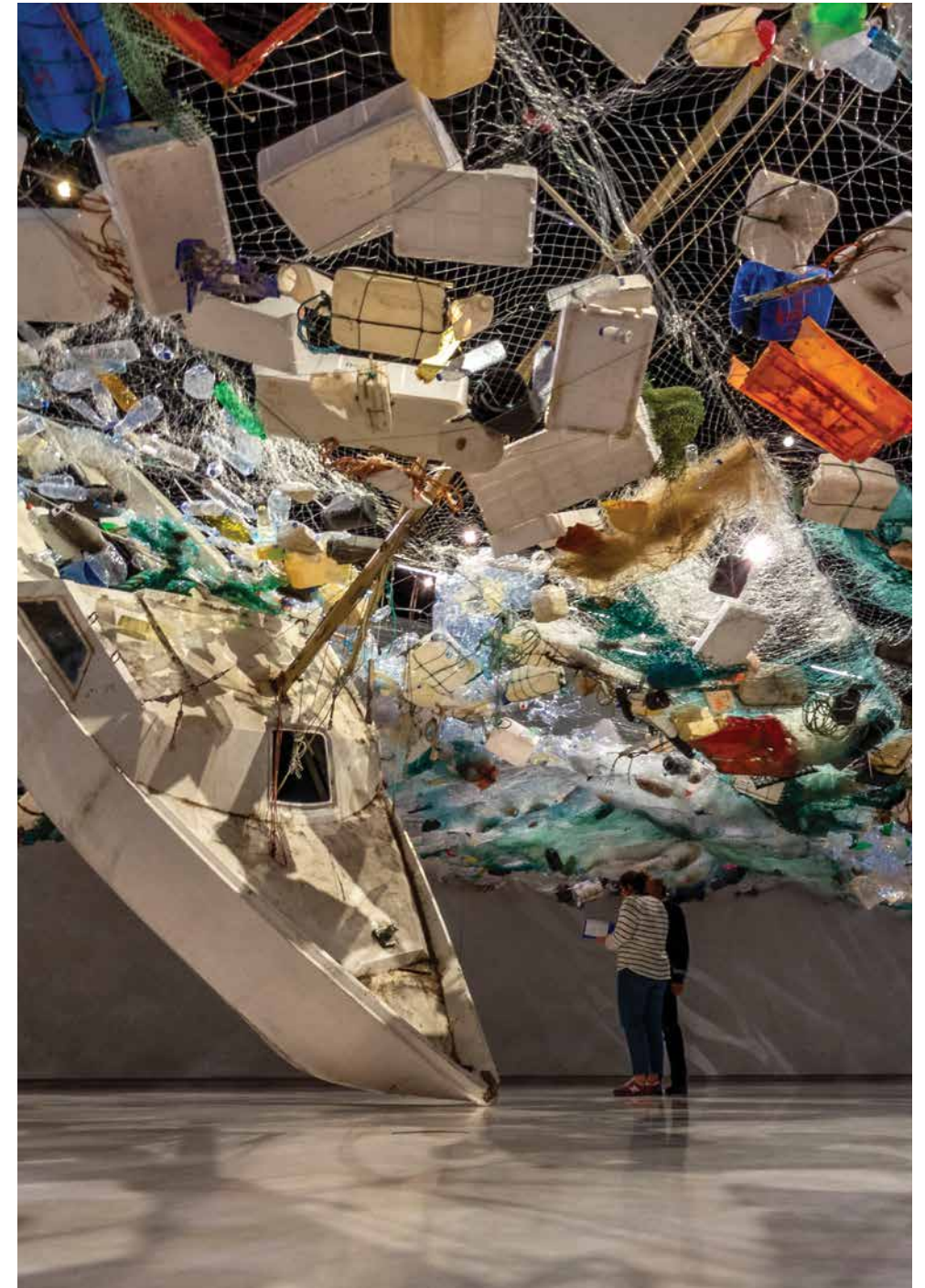
Not only are we increasingly expected to make “right” choices about what we buy or do, we are increasingly likely to be criticized if we don’t. In Sweden, “flygskam” (flight shaming) and “tågskryt” (train bragging) has resulted in an 8 percent fall in airport passengers and 2 million extra train journeys. Swiss bank UBS found one in five people have cut the number of flights they took over the past year – which could halve current growth in passenger numbers – because of impact on the climate.

Employers, meanwhile, must embrace workers’ liquid expectations – measuring employee experience and satisfaction as they have long done with customers. In the words of author Miya Tokumitsu: “There’s little doubt that ‘do what you love’ is now the unofficial work mantra for our time.” Employers who haven’t already done so must start to prioritize purpose and wholeness in their recruitment, retention and benefits plans to meet the expectations of younger generations as they enter the workplace. We’ve started to question work-ism – described by one commentator as “a religion making Americans miserable”. People’s desires to be understood as fully-rounded individuals – with all inherent complexities and contradictions – continues to grow stronger. One response is recently demonstrated by Starbucks’s decision to offer mental health services as an employee benefit.



2019 saw Mattel release Creatable World – the world’s first gender-neutral dolls, which can be male, female, neither or both.

Single-use plastics remain a pressing concern, with companies like Everlane making efforts to help reduce their impact.



What's next?

Liquid people is not a by-product of the rise of new definitions of corporate growth – it's far more personal and profound. Initially, it's likely to feature most heavily in more developed, western markets, but its impact is likely to be far-reaching over time. Eventually, people's recategorization of products they regard as lacking function or seeming wasteful will also see value itself redefined.

We fully expect to hear more about ethical anxiety – perhaps it could even become the Oxford English Dictionary “word of the year” in 2020. It'll sit in the background as we navigate trade-offs not only between competing ethical demands, (How far has this product had to travel? How well was it produced?), but also between these demands and our own wants and desires. One Fjord designer told us that her housemate refused to join her in decreasing plastic consumption because he was already “doing enough” by being vegan.

For now, conscious consumerism may not be for everyone but as it becomes a new social currency, it will go mainstream in certain markets – and organizations must be ready to respond when it does.

Liquid people suggests that we need to connect customer and employee experience much more closely than ever before. If both customers and employees are seeking similar goals, why not link them implicitly or explicitly in the pursuit? Imagine if employees gained much higher job satisfaction by delivering the new types of added value to customers? After all, 60 percent of young people launching their careers want a job with

social impact. As the debate about the workforce of the future intensifies, why not set, for example, a measurable goal for energy company workers to help their customers reduce consumption? Or for bank staff to assist their customers with meeting savings goals?

Of course, not everyone wants to save. As people's needs change, makers of products and services will need to embrace new ways to understand them, and to help them define who they are and make good decisions. Organizations must understand both the particular priorities and concerns of different people – as well as where shared priorities and concerns overlap.

Worldwide, the number of people aged over 65 is expected to double between 2019 and 2050. In developed markets characterized by rapidly aging populations, some retirees' search for meaning is expected to become a growing concern. In Europe, while the total population is projected to increase from 511 million in 2016 to 520 million in 2070, the working age population will fall over the same period more significantly – from 333 million to 292 million. Come 2030, the US's older generation is expected to outnumber its children for the first time in the country's history.

“All too often, individuals are left to their own devices when it comes to finding a new sense of purpose in a post-retirement period that could be as long as the middle years in duration,” according to Marc Freedman, author of *How to Live Forever: The Enduring Power of Connecting the Generations*. “Many feel like they are all alone in navigating the new terrain, practically and emotionally.”

There's opportunity for organizations to develop products and services that help retirees in their search for a new sense of who they are. At the same time, companies must be cautious about making assumptions based on any person's age or life stage. A preference for conscious consumption and for products, services and work with alternative values – and without negative impact on the world – is just as likely to be held by people in their thirties and forties as by teens and twentysomethings.

This trend isn't a generational shift – in other words, it's not just about Millennials. As we understand more about ourselves and our responsibility to our planet, people of all ages will be thinking this way in ever-growing numbers. It follows, therefore, that all organizations will need to think more carefully about how they design for and communicate with all generations of customers and staff.



“There’s little doubt that ‘do what you love’ is now the unofficial work mantra for our time.” – Miya Tokumitsu, author

Fjord suggests

Reimagine your offering
for the era of conscious
consumerism.

Think



How does your brand enable people to define themselves beyond what they consume, the work they do or the income they earn? How does your business think about people beyond the boxes of “customer” or “employee”?

Say



Strike the word “consumer” from your vocabulary. Provide people with choices that allow them to flex and explore their identity.

Do



Set up Human Insights teams instead of Consumer Insights – focus less on the number of people that are taking specific actions, and more on the context that surrounds their decision-making. Help people navigate anxiety around ethical choices.

Trend 5

Designing intelligence

Artificial Intelligence (AI) is moving on. While, at first, it was largely used to improve efficiency through smart automation, its next iteration will be more about adding new value and supporting human ingenuity. If we can design systems that effectively blend people's skills with AI, we'll be able to devise disruptive business strategies, empower people to cope with increasing complexity in the workplace and enhance the human experience.



What's going on?

No longer an emerging technology, AI is becoming woven intricately through our everyday lives. Organizations are now making impact by implementing AI in three ways:

First, the AI we're aware of and increasingly take for granted – including apps that know how to categorize photos on our phones, help us navigate the world, answer our questions or control our devices via in-home agents. Usually the machine-to-human help can be divided into three clear categories: see, hear and recommend.

Second, the AI we're not always aware of – in smart services like Stitch Fix, which offers personalized fashion curation by AI and algorithms in partnership with human stylists, and in the Irish tax office's sophisticated conversation agents that give people the answers they need 24/7.

Third is the AI we're fully unaware of, but which helps to drive the products and services we use – unseen. Rolls-Royce uses it for predictive maintenance, analyzing data from internet-connected sensors to spot signs of wear and tear in airplane engines,

Start-up Atolla calibrates face serum to each customer's exact skin characteristics.



ASOS predicts customers' lifetime value based on online shopping behavior, and 80 percent of US stock market activity is powered by algorithmic trading agents.

"Since 2013, the tech industry has been re-making itself around Machine Learning," according to consultant and mobile analyst Benedict Evans. In *Fjord Trends* over the years since, we've predicted AI's evolution: through *Me, myself and AI* in 2017 – about putting a human face and voice on AI and related interactions at a customer service level – and in 2018's *A machine's search for meaning*, in which we outlined the new dynamic of people and AI working together.

For many businesses, early AI successes have revolved around automation, making the two seem synonymous – a misunderstanding reinforced by a persistent narrative that increasing AI reduces labor costs. Organizations are starting to recognize, however, that machines have limitations people don't: AI can struggle to untangle unpredictable events, to keep up with evolving systems, and to understand how such things affect people.

Incidents of algorithmic bias, (where existing social injustices get codified into AI advisors), contributes to racial discrimination in healthcare and gender inequality in recruitment. Over-automation can also lead to complacency, as demonstrated by autonomous vehicle accidents where handover to human drivers failed. Even when organizations attempt to improve automation, we've seen examples of collateral damage – for instance, where efforts to stop internet bullying inadvertently resulted in LGBTQ advocates being demonetized or having content removed.

As AI's positive and negative effects unfold, we're witnessing a growing divide in opinion. Businesses are accelerating their AI programs, with 80 percent reporting that it's now in production within their organization in some form, yet customers and employees are becoming wary of its impact on their lives. 82 percent of Americans believe that AI and robots need to be managed carefully, and there's evidence of rising resentment from workers whose labor is controlled by algorithms.

To reconcile these differences, organizations must move beyond the automation mindset and start to see AI as a dynamic tool that employees can use to improve the business. Doing this requires better tools and more careful consideration of the economic and social effects of introducing the technology. Designing for AI means designing for human intelligence and optimizing the relationship between people and machines.

*Human machine
collaboration*

What's next?

We're breaking out of the categories of see, hear and recommend. Pioneering organizations have already evolved from automation to value creation, and are expecting radical changes in business models over the coming years.

Organizations will need new, systematic approaches for unlocking the full potential of human collaboration with AI. We posed important questions in 2018 that remain unanswered: how will we interact with machines, how will we learn to work with them, how will they learn from us, and how will we create two-way communication?

In our work with The Dock, (Accenture's flagship R&D and global innovation center in Dublin, Ireland), Fjord has been investigating these questions and the role of design to improve people's partnership with AI. This work has identified three areas where such collaboration should lead to dramatic value creation in the next few years: enhancing the human experience, empowering workers to tackle increasing complexity, and envisioning new products and services.

Firstly, designed correctly, AI can be used to create experiences that are not just personalized but help us extend our perceptual capabilities. It can enhance our vision – it's allowing biologists to see inside living cells, and enabling us to map deforestation and biomass reduction that the naked eye might otherwise miss. It can extend our understanding – Google Lens's advanced image recognition has evolved from helping anyone to read instantly in foreign languages to identifying plants. It can make us better learners – Iris by Pluralsight is a technical training advisor that uses natural language processing and Machine Learning (ML) to recommend content, updating question difficulty and skill ratings as it collects feedback.

AI can make us more conscientious communicators – Instagram uses AI to address bullying by detecting potentially harmful content, then asking the writer if they really want to post it. AI can help us manage our money better, as automated debt manager Tally neatly demonstrates.

The second area of value creation is that AI helps us with complexity. The combination of digital transformation and globalization has expanded the speed, complexity and scale of business infrastructure. This has required most large organizations to establish in-house data science teams

to help them understand and improve their operations. However, to transform their insights into replicable actions, we must design trustworthy AI-driven tools and services that empower employees operating in these increasingly complex and dynamic systems.

In transport, Tokyo's Railways Technical Research Institute (RTRI) and the Swiss Federal Railways (SBB) are researching the use of neural networks and AI applications. Their aim is to combat train delays and optimize scheduling in their complex networks by helping dispatchers and controllers work with AI to make decisions and provide information to passengers. In healthcare, Moorfields Eye Hospital and DeepMind built an ocular diagnostic prototype where the analysis of retina scans showed specifically what the diagnosis was based on, enabling doctors to make informed decisions.

In information technology, virtual infrastructures pose an even greater challenge to operations. The intangible nature of data and IT systems allows for complex dependencies to evolve, so application performance companies like Dynatrace use AI to monitor cloud infrastructure, alert managers to issues and even provide root cause analysis.

In business, Marc Benioff, CEO of Salesforce, uses his company's AI product, Einstein, in board meetings to enable the team to dynamically explore data as they plan. "The truth is that business has become too complex and is moving too rapidly for boards and CEOs to make good decisions without intelligent systems," according to MIT Sloan researchers.

While AI is helping us understand business, design is helping us understand AI. A critical factor as, across industries, more



Tokyo's Railways Technical Research Institute is working to help dispatchers and controllers work with AI to make decisions that combat delays.

and more business decisions are being managed by algorithms. Some organizations are already researching ways to tackle bias issues.

For example, Accenture's algorithmic fairness tool uses ML to detect potentially biased training data and suggest ways to adjust for it. Independent research groups like Share Lab conduct data investigations into themes including internet privacy, transparency and the sustainability of online platforms to clarify the role of data in the digital economy. By designing interfaces that make the logic of AI visible and open to human direction, and by mapping out the relationships between systems, we can enhance people's trust in them.

Thirdly, and possibly where the value created will be the greatest, we can expect to see a rapid change of focus within AI development to more complex activities like simulation, decision support and especially innovation. Some organizations are already using AI to speed up the design and innovation of new products, services, and even entire business models.

Finch is a new architectural tool that automatically reflows the fittings within rooms when dimensions of a building are adjusted, potentially allowing senior architects to set up design systems that can adapt to different contexts. Designer Philippe Starck has been collaborating with Kartell to create the first chair designed through human/AI collaboration.

MakerSights is a decision engine used by Levi's, Madewell and Allbirds that determines which styles will be winners and losers, narrowing the gap between what brands think customers want and what they do want. Start-up, Klydo, applies AI to help strategy teams identify, prioritize and gain approval for innovation opportunities.



AlphaStar can take incomplete information and still devise strategies to beat professionals at complex video game, StarCraft II.

Philippe Starck and Kartell's "A.I." chair is a physical representation of what people and machines can do when they work together.



In health and life sciences, Nuritas uses AI to help discover new bioactive ingredients – one of which speeds up post-training recovery by reducing inflammation. Skincare start-up Atolla's Skin Health System gives people testing kits that measure the exact characteristics of their skin then sends them face serum calibrated to their individual needs. US-based Freenome is using AI to turn hidden genome patterns into tools for early detection and better treatment of cancer.

Many of these examples use parametric design – a process where people set the goals, constraints and processes for a specific problem, and AI accelerates the discovery of an optimal solution. However, parametric design relies heavily on complete information – unlike humans, who can infer missing pieces of a puzzle they can't yet see. Neuro-evolution is an approach where researchers set the goals to be achieved and the AI must figure out how to achieve them.

The ability to solve problems with incomplete information is a big step toward making AI applicable to real business challenges. AlphaStar, (AI developed by DeepMind that can beat professionals at complex video game StarCraft II), is a powerful example: despite starting with incomplete information, it explored the world to create a diversity of strategies for winning the game.

AI and people view the world very differently, and if we harness AI for innovation, we could generate ideas we'd never dream of ourselves. Coupling this radical novelty with human social awareness has the potential to solve problems of a scale and complexity as yet unimaginable. It's not a race against machines, but with machines.



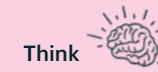
“The truth is that business has become too complex and is moving too rapidly for boards and CEOs to make good decisions without intelligent systems.”

— MIT Sloan researchers

Designing well for AI means designing for the human intelligence around it, to get the very best from the relationship between people and machines.

Fjord suggests

Reimagine how to design AI for the human intelligence around it to step to the next level of value creation.



Think

How can you make AI part of your strategic decision-making process rather than just automation of individual tasks? Where in your processes does human input add more value, and where is AI better suited for the job? What human qualities will you intentionally design into your AI colleague? How will you effectively manage the interface and handover between people and machine?

Say



Talk about AI in simple terms according to what it can do – see, hear, recommend – rather than technical descriptions, like “computer vision”.

Do



Trust AI data to help you in your decision-making and mock-up your AI first before heavily investing in it – barriers to entry for AI prototypes has dropped dramatically, thanks to online prototyping platforms.



SYNTHETIC TWINS

Trend 6 Digital doubles *Digital doubles*

Digital twins like 3D and data models are established tools in manufacturing and industry. Now, they're getting personal, and the race is on to create virtual manifestations of ourselves. At first, they'll offer personalized entertainment opportunities. Soon after, they'll combine with other agentive services. Eventually, they'll become a virtual home for all our data over which we'll have control (at least in theory). As a basic requirement, brands and public services must learn to design for our new digital doubles - the few that learn how to create them will be the biggest winners.

What's going on?

The aggregation of some personal information centrally is not a new idea: Microsoft's .NET My Services was an attempt in 2001 to allow access to contacts, calendar and email which never fully materialized due to privacy and anti-competitive concerns. Google's suite of products based on Gmail is arguably an up-to-date realization of this. What's coming next, however, goes way beyond a central access point for static data, because it unleashes the power of metaphor in our understanding of what's possible, which in turn will inspire acceptance of innovative services. In essence a digital double of me is easy to understand. Now we need to make it useful, secure and easy to interact with.

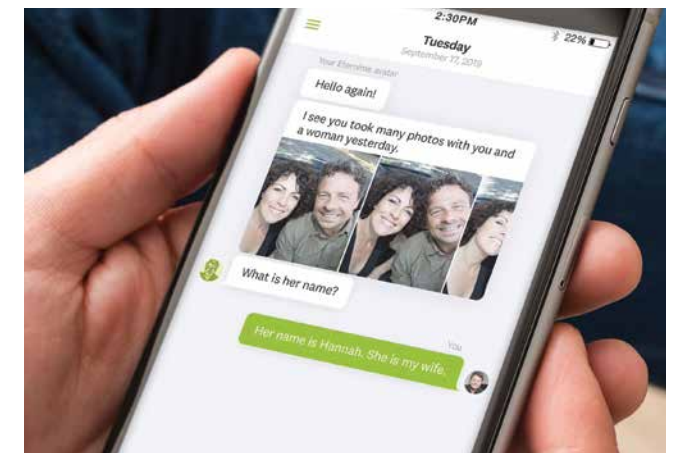
Data portability

Right now, we think of a digital twin as a virtual model of a physical process, product or service. The pairing of virtual and physical allows data analysis and systems monitoring that make it possible to head off problems before they happen. As they can self-optimize over the course of a product or system's life cycle, they're increasingly being used by a diverse array of organizations and industries as virtual prototypes or test beds. For instance, UK start-up SenSat uses Artificial Intelligence to digitize real-world places for infrastructure projects, and recently attracted multimillion-dollar investment from Chinese multinational conglomerate Tencent.

Gartner recently predicted that half of large industrial companies will use digital twin technologies by 2021, and according to Juniper Research, digital twin revenues will rise from US\$9.8 billion this year to US\$13 billion in 2023. Grand View Research predicts the global digital twin market will reach US\$26.07 billion by 2025.



We could soon see our online behaviors and data reflected in digital doubles that we control.



Eternime preserves people's memories for their loved ones to access long after they have passed away, allowing them to exist as an avatar forever.

Modeling agency The Diigitals only represents synthetic models, including Shudu and Galaxia.



Recently, digital twins have started to move beyond industry into new spheres. A range of other areas – such as financial services, healthcare and the workplace – have started to recognize their potential.

Social media is awash with digital selves, where it's become the norm for people to interact via synthetic or filtered versions of themselves. It even hit the news when Chinese vlogger Qiao Biluo's real appearance was exposed after a technical glitch disabled her beauty filter. Many teens and influencers have dual identities presented through fake social accounts called "finstas" – one to project a public profile for a wider audience, and another for close friends – to protect their privacy.

In gaming, a growing number of female players use "voice skins" that distort their voices during chat room interactions with male gamers to avoid harassment. While these anonymity tools have the potential to make the internet feel safer, some suggest they could also make it riskier as they free people from accountability. For example, Snapchat's hugely popular gender-swapping augmented reality lens – downloaded 7 million times in its first few weeks – has been used to catfish unsuspecting men on Tinder.

In entertainment, Mackevision creates digital twins of products such as cars, planes or physical products, for visualization in content creation. In pornography, a sector that's often an early adopter of new technology, Camasutra Industries has created high-resolution 3D scans of adult movie actors for use in VR porn. In fashion, there are digital supermodels such as Shudu and Galaxia from all-digital modeling agency The Diigitals, which only represents synthetic "humans". Elsewhere, DNABlock is a start-up that creates 3D avatars of people from high-resolution 3D scans, allowing them to put their own avatar to work, licenced out by the agency. "Anything you can really think of that a human can do digitally, you can replace with an avatar," says DNABlock co-founder Christine Marzano.

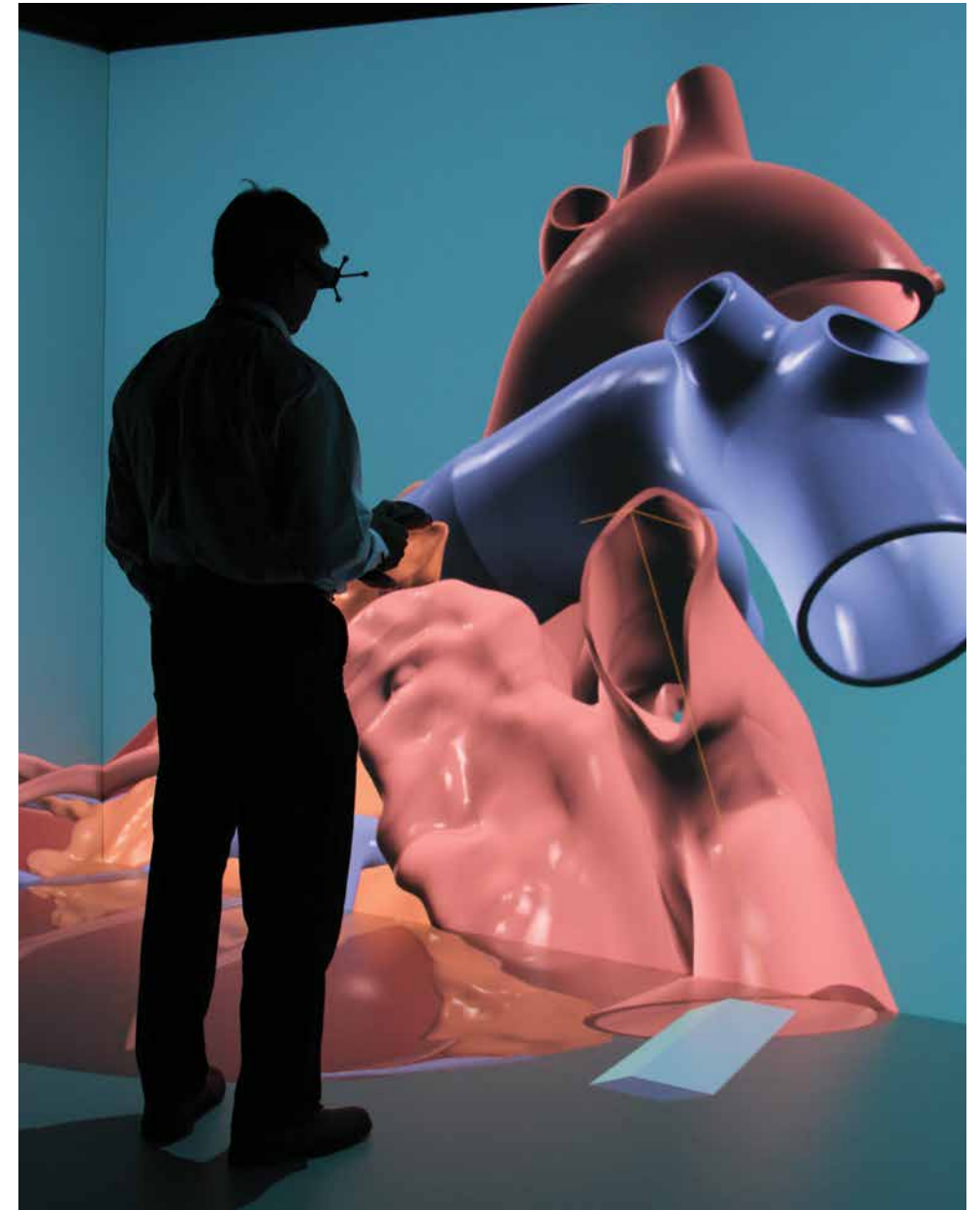
"Anything you can really think of that a human can do digitally, you can replace with an avatar."

— Christine Marzano, co-founder of DNABlock

Digital twins are also being recognized as an invaluable tool for brands to surface relevant solutions when people are likely to be most receptive to offers based on their unique interests, driving the future of customer loyalty. Meanwhile, emotional chatbot service Replika creates a personal AI with whom a user can express and share life events. Eternime collects a deceased person's online presence and makes a digital replica of them for their loved ones.

Employers are collecting employee data to improve productivity and proactively monitor attrition. In its Decoding Organizational DNA report, Accenture Strategy suggests that implementing responsible data strategies can help build employee trust and help generate sustained revenue growth. At IBM, AI – which has replaced 30 percent of the company's HR staff – can use their extensive workforce data to help employees identify new skills training, education, job promotions and raises, and to predict with 95 percent accuracy which people are about to resign.

In our trends last year, we predicted *Synthetic realities* – AI-generated realities mixing real and virtual. As digital twins and synthetic realities further combine, we will see the emergence of the next generation, personal equivalent – digital doubles that combine your data, context and aggregated external information.



The Living Heart Project is exploring what we could achieve if medical devices could be designed and safely tested virtually before being tested in the real world.

What's next?

In the near future, we can expect people to start designing and controlling their own ecosystems, ruled by algorithms they own and that serve their best interests—not those of companies. “It’s going to be very personalized, very individualized, because what you want when you go on vacation might be very different from what I want. Your personal digital twin will know that and work for you and mine works for me,” says Forrester Vice President and Principal Analyst on Customer Experience Rick Parrish.

The ongoing absence of true data portability has been blamed for maintaining monopolies and harming workers. In turn, this has perpetuated a situation in which people generate data they exchange for services with social media companies, search engines, online retailers, governments or banks. Digital doubles will re-write this model: by doing the work with companies and serving back to the user the best solutions for them, they will begin to become the gatekeepers of our digital lives.

Ultimately, your digital double should act in your interest and on your behalf in many areas of your life. Imagine it booking your vacations knowing not only your preferences, but also your calendar and budget (not now but in the future) – saving you money, effort and anxiety while adding enjoyment and experience. A digital double should flip spammy product push and advertising on its head, shielding you from the avalanche of fragmented recommendations, instead guiding you in ways that fit your lifestyle and preferences, while caring for your wallet and the planet. Of course, this scenario is still some way off, yet we see clear steps toward it.

The Data Transfer Project is the first step toward housing all of a person’s data in one place. By facilitating a collaboration between major technology platforms, it’s building a common framework that will enable people to move their data between two platforms seamlessly, directly, and at their own initiation.

In life sciences, digital twins are in the research phase, but will eventually be used to project, predict or validate the outcomes of medications, surgeries and lifestyle choices. The Living Heart Project aims to repurpose advanced simulation technology used by the automotive, aerospace, energy and tech industries to analyze patients’ health and plan therapies and surgeries – University of Auckland has developed a virtual lung with similar intentions.

AI is enhancing quality of life for people with degenerative conditions. When Dr. Peter Scott-Morgan was diagnosed with motor neuron disease, he decided to transform himself into a cyborg. Working with a team of doctors, technologists and designers, he has become a living experiment in pushing the limits of human interaction with AI.

A different flavor of digital twin, a new breed of “agentive services” is now under development, in response to concerns about privacy and safety combined with the complexity of the modern world. AI-driven Polisis reads and digests complex privacy policies so people don’t have to, and NDA Lynn is an AI lawyer that will review a non-disclosure agreement for its user. Meanwhile, Awario tracks mentions of a particular brand.

As everyday services like automated banking start to combine with digital twins’ data intelligence, it’s probable that people will increasingly want everything in one place and under their control. Instead of struggling to understand our personal data stored in amorphous, abstract clouds, we could keep it in our digital double – the perfect mental model for our data double – and nurture it to expand its capability, Tamagotchi-style.

Organizations will need to understand digital doubles from both a business and human perspective. Google learned this lesson through its ongoing development of Duplex – in effect, a digital double by proxy – which initially proved a confusing experience for people on the receiving end, some of whom mistook Duplex for a spam call. Following feedback, Google has announced plans to position Duplex to help people book car rentals and movie tickets.

Companies must be careful when striving to understand how people relate to their digital doubles, and how their existence changes the way people see themselves. The way our digital doubles are visualized will be important. If we see a proliferation of digital doubles based on idealized or objectified representations of people, there’s obvious potential for negative impact on our self-image, as we saw with the airbrushing controversy a few years ago.

The critical consideration for people will be: who do I trust to host my digital double? A critical consideration for organizations will be: how can we design trust and safety in to give people the confidence to choose us as their host? It will be important to design any personal digital double experience to make it engaging, transparent and seamless. Interface and interactions must match the mental model – and must be simple and clear.



“Companies must be careful when striving to understand how people relate to their digital doubles, and how their existence changes the way people see themselves.”

— Fjord Trends 2020

Who do you trust to host your digital double?

Fjord suggests

Reimagine the representation of people.

Think



What category of interactions could be opened up by digital doubles? Shape your strategy with digital doubles around three use cases:

1. Delegating tasks for you.
2. Masquerading your presence.
3. Modeling your behavior or future.

Say



Make it clear to people that they have control of their data – not you – and demonstrate that your platform can be trusted to win customers and employees.

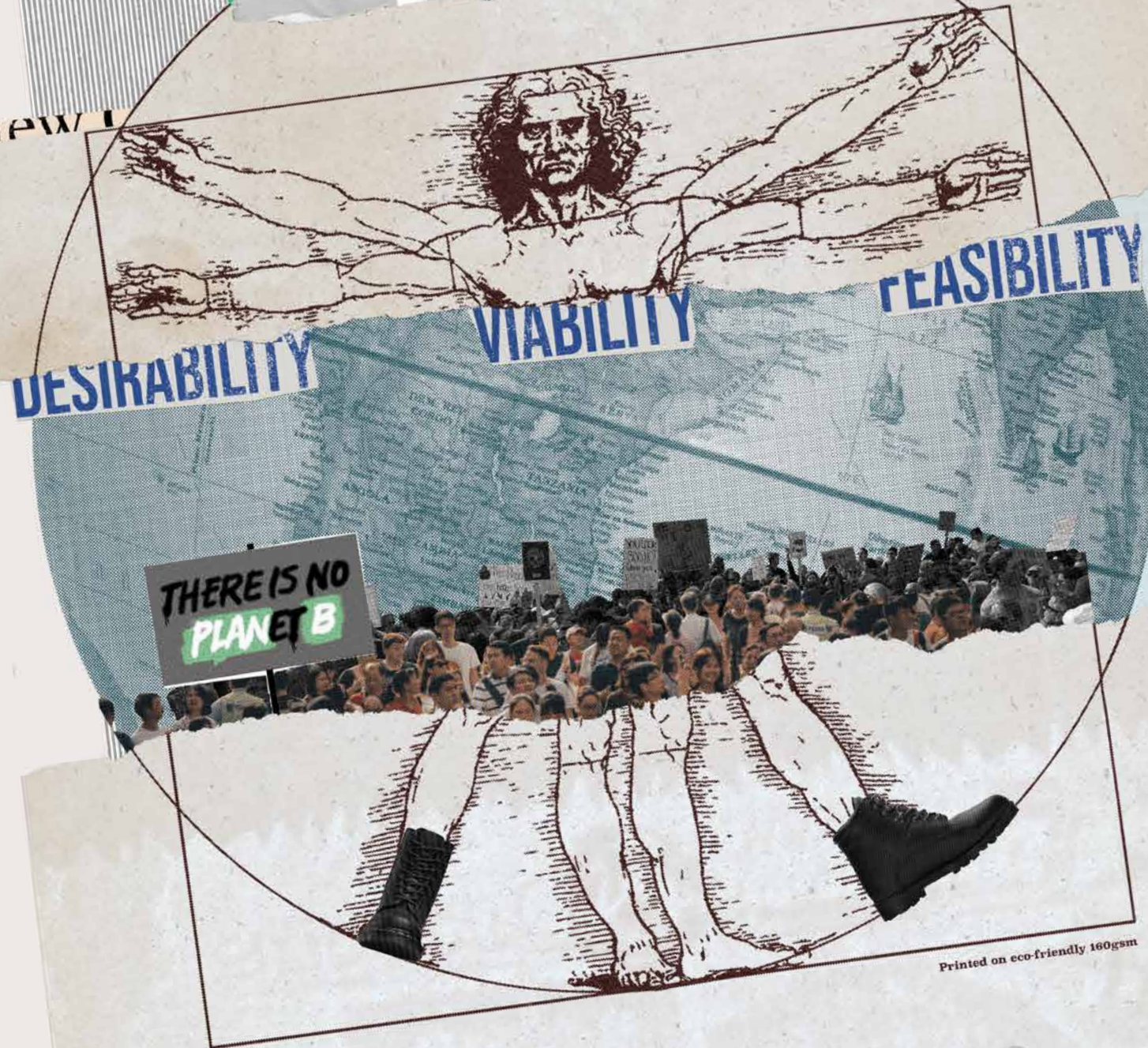
Do



Ensure data reliability, but make sure you're not overly dependent on the data – always include the “lived reality”. Avoid falling into the gamification trap but do play and experiment, as this is a new realm with properties which are as yet undetermined.

HOLIST

NEW



Trend 7
Life-centered design

Our trends this year examine how organizations are working to define new forms of growth that sit alongside profit, and how people are moving away from defining themselves simply by the items they buy or the work they do. As part of the same picture, they reveal that people's focus of desirability, viability and feasibility is moving from "me" toward "we". As this accelerates, user-centered design will feel increasingly selfish and design's emphasis will make a switch in favor of design for all life.

What's going on?

We're all adjusting our balance, so design will need to shift its emphasis in response. *Life-centered design* – inspired by writer John Thackara's theory of designing for all life, not just human life – is the response to the trends we are highlighting this year, particularly *Many faces of growth*.

As we witness a shift from "me" to "we" unfolding across the political and social spectrum, we can also see an evolution in design from user-centered to human-centered and now life-centered design. We're starting to edge away from designing for one to designing for the collective – i.e. the entire planet. The values contained in the traditional Venn diagram of desirability, feasibility and viability are fundamentally changing – as are our design responses to them.

Until very recently, desirability has been all about what's in it for the user or customer. Increasingly, it's becoming about what's in it for the customer and their collective cause across the political spectrum – whether that means sustainable living or taking sides in a trade war. US skincare and cosmetic



Design is perfectly positioned to introduce a systems mindset into any business, due to its multi-disciplinary, facilitatory role.

“The perfect overlap between desirability, feasibility and viability is a sustainable and/or a desirable product or service that also makes business sense.” – Fjord Trends 2020



The intersection between desirability, feasibility and viability is evolving—we're all becoming less self-centered and more life-centered.



business Beautycounter's The Never List of toxic ingredients it pledges to never use in its products is one example of how desirability is being redefined. City First Bank of DC's commitment to prioritizing 80 percent of its loans to underserved communities is another. French food giant Danone established Danone Manifesto Ventures to partner with a community of disruptive entrepreneurs focused on creating a healthy and sustainable future of food.

Meat is a well-publicized example. Once, people would enjoy the luxury of a 28-day dry-aged burger, and appreciate the time and effort it took to achieve that quality. Now, the enjoyment of eating an Impossible Burger comes from the knowledge that we're eating something that's better for the planet. This is a redefinition of desirability made possible by new material and food technologies and a Silicon Valley-style business model comprising venture capital funding, rapid experimentation and innovation, and bringing a clear story to market.

Feasibility was once governed by material or digital production and consumption. Increasingly, it's becoming governed by life cycles of environmental and societal impact. Digital has radically changed what's possible, but new materials and changing societal behaviors are swiftly catching up in the physical world.

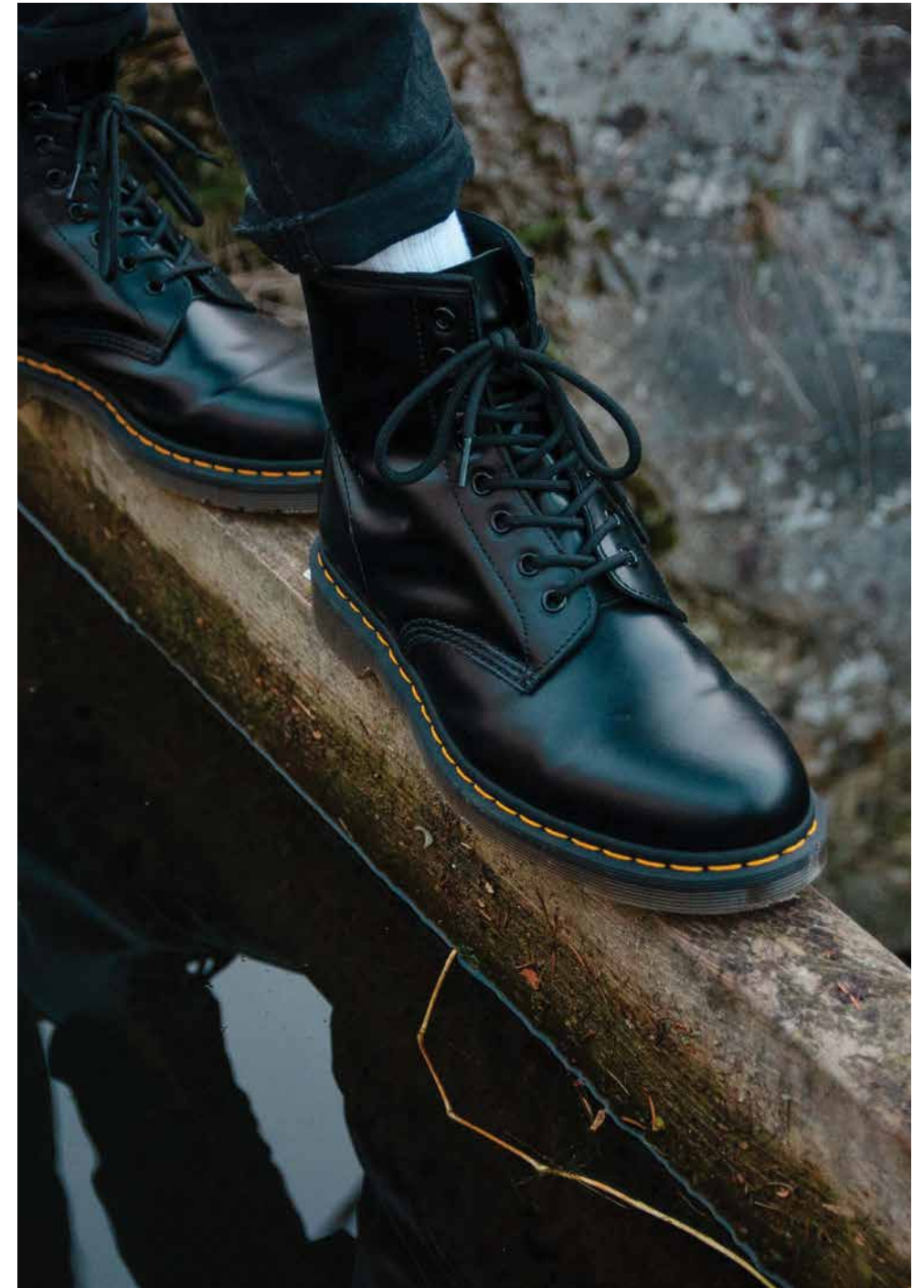
For example, in India, Saathi developed the world's first 100 percent biodegradable sanitary pad from banana fiber – the company claims to eliminate 60kg of pad waste per woman in her lifetime. Fairphone is a smartphone “for everyone who cares about how their products are made” because “how it's made matters”. It improves the conditions of the people who make it and uses materials that are better for the planet. Unilever's trial of refillable packs, based on a model in which ownership of the packaging passes from customer to manufacturer, is enabled by the recently launched global e-commerce retail platform LOOP.

Brands can exploit a considerable opportunity by providing a guilt-free customer experience – this is part of the explanation for the phenomenal rise of re-sale, an industry growing 21 times faster than conventional retail. Stuffstr is a start-up that enables customers to sell back the apparel they no longer use to their favorite retailer, making re-commerce a part of every retail transaction. Nudie Jeans offers free repairs for life, while a cult Danish label recently launched a rental proposition: GANNI Repeat.

These examples were only made viable because they offered short-term return on investment and shareholder value. Increasingly, viability is being shaped by a project's contribution to a broader purpose in the world. Outdoor products brand and certified B Corporation Cotopaxi was founded on the idea that the interest of profit and people could not only co-exist but could be mutually beneficial. From its giving model to its company culture and sustainable product design, it sees its business as a vehicle to make a positive impact. In another example, asset management firm BlackRock has launched two funds for environmental, societal and governance (ESG) issues. Soon, the only viable business model will be one that takes ESG concerns into account.

Design that brings customers into a collective cause is one example of life-centered design. In Denmark, designers Mater work at the forefront of sustainable materials, incorporating recycled plastic and aluminum into a wide range of home furnishings and, by so doing, introducing more people to sustainability while embedding transparency into the design journey.

The perfect overlap between desirability, feasibility and viability is a sustainable and/or a desirable product or service that also makes business sense. For instance, iconic shoe brand Dr. Martens boosted profits by 70 percent when it introduced a vegan range of footwear made from synthetic material. Elsewhere, global architecture firm Snøhetta has developed Powerhouse, a super-efficient building that generates solar energy for the neighboring community, producing twice the energy it consumes.



Dr. Martens launched a range of vegan footwear, meeting people's desire for products with ethical credentials.

What's next?



The world's northernmost energy-positive building, Powerhouse Brattørkaia aims to produce more energy than it consumes over its lifespan, including construction and demolition.

Businesses struggle to keep up with the rapid shifts in customer values and, as they continue to evolve at a pace, the pressure is on organizations to respond effectively. Those producing physical goods will have to change often complex supply chain and manufacturing processes in time to meet customers' demand for purposeful products and services that make a positive impact. Those in digital must replace their business model of constant engagement and self-service with alternatives that reinstate the interpersonal connections, attention and time that people want.

There's opportunity in combining digital and physical re-design. In the UK, IKEA's kitchen of the future partnership with the AI-system Winnow – which automates food waste capture and provides richer insight to help kitchen teams reduce waste and increase efficiency – saved it 50 percent of its in-store food waste.

As John Thackara has observed, because everything affects everything else in one way or another, organizations will increasingly need a systems mindset when dealing with complex problem-solving. A systems mindset combines purpose with people, with life at its heart, and comes from many years of practice, craft and habit. Thanks to the multi-disciplinary, facilitatory role that design plays, designers are well-placed to introduce this mindset to any business. In today's fast-changing landscape, designers must change, too.

Typically, design has always keenly felt the impact of technological change, most obviously industrial (designing the tools to make objects indirectly), and digital (using code to design experiences mediated by a screen). These changes introduced layers of abstraction and experience. Previously, when designing for digital, designers needed to understand the devices their designs would be consumed on and the contexts in which they would be experienced. Next, they must broaden their understanding to look at entire systems as they increasingly design for all life.

“Design is a connecting tool between people, economics and the environment – and out of this communion, understanding and respect for new ideas and products with integrity can come,” according to Dr. Carmen Hijosa, creator of sustainable textile Piñatex and CEO of the company that makes it, Ananas Anam.

For years, the application of user-centered and human-centered design advocated by so many has often separated people from ecosystems. Now, designers must start to address people as part of an ecosystem rather than at the center of everything. This means designing for two sets of values: personal and collective. Designers and clients must both face this complexity head-on and unite the best of systems thinking and practice, together with design practice. As we design both for this and for the migration from current systems to a new one, we'll use transition design frameworks more and more.

The trade-offs between our desires and convenience – between health, joy and ease – will need to be managed carefully. Winning brands will increasingly be those that help people navigate their ethical anxieties about consumption by delivering alternative engaging experiences. Those brands that fail to turn words to action, demonstrate evidence of their purpose and increase their ESG metrics may struggle. In short, design must now extend beyond its own ecosystem.



“Design is a connecting tool between people, economics and the environment – and out of this communion, understanding and respect for new ideas and products with integrity can come.” — Dr. Carmen Hijosa, CEO of Ananas Anam

People's attitude to their planet is evolving, and businesses must prioritize environmental, societal and governance concerns.

Fjord suggests

Reimagine the role of design in 2020.



Think

Redefine desirability, feasibility, viability in your work. How can your offering become regenerative by design, including deleted items that disappear from view? How can you use design as a central tool for creating alignment around change, and the purpose of innovation?

Say



State that you consider natural, political and societal ecosystems as equals – practice “do no harm” in all areas, rather than paying lip service. Demonstrate that life-centered design is your new norm, and not just a project.

Do



Update your design skillset with systems thinking. Collaborate with other disciplines, such as scientists, technologists and futurists, and actively design in systems that encourage people to reduce their use of resources.

References

Many faces of growth

Ray Dalio, *LinkedIn*, “Why and how capitalism needs to be reformed (Parts 1 & 2)”, April 5, 2019

Alan Murray, *Fortune*, “America’s CEOs seek a new purpose for the corporation”, August 19, 2019

Sean Farrell, *The Guardian*, “‘Damaged ideology’: business must reinvent capitalism – ex-Unilever boss”, October 29, 2019

Marc Benioff, *The New York Times*, Marc Benioff: We need a new capitalism, October 14, 2019

Financial Times, “FT sets the agenda with new brand platform”, September 16, 2019

Ellen MacArthur Foundation, “BlackRock becomes Ellen MacArthur Foundation global partner”, October 8, 2019

Ahiza Garcia, *CNN Business*, “Amazon workers walk out to protect climate change inaction”, September 20, 2019

Brian Kahn, *Gizmodo*, “It’s kids vs. the world in a landmark climate complaint”, September 23, 2019

Esha Dey, Drew Singer, Ryan Vlastelica, Kristine Ogram and Mathieu Benhamou, *Bloomberg*, “Unprofitable companies are raising the most IPO cash since the dot-com era”, September 25, 2019

James D Walsh, *New York Magazine*, “At what point does malfeasance become fraud? NYU biz-school Professor Scott Galloway on WeWork”, October 1, 2019

Sandra Laville, *The Guardian*, “Swedish newspaper stops taking adverts from fossil fuel firms”, September 26, 2019

Abha Bhattari, *The Washington Post*, “The status quo is unacceptable: Walmart will stop selling some ammunition and exit the handgun market”, September 4, 2019

Emma Charlton, *World Economic Forum*, “New Zealand has unveiled its first ‘well-being’ budget”, May 30, 2019

Fjord, Fjord Trends 2018

Denis Machuel, *LinkedIn*, “Taking action against food waste: an urgent priority to limit climate change”, October 16, 2019

Mariana Mazzucato, *World Economic Forum*, “How to create a more purposeful capitalism”, January 15, 2019

George Monbiot, *The Guardian*, “Finally, a breakthrough alternative to growth economics – the doughnut”, April 12, 2017

Robert Eccles, *Harvard Business Review*, “Why it’s time to finally worry about ESG”, May 21, 2019

Mattha Busby, *The Guardian*, “Capitalism is part of solution to climate change, says Mark Carney”, July 31, 2019

Accenture, “Business contribution to the 2030 agenda for sustainable development not on track, United Nations Global Compact and Accenture study finds”, September 24, 2019

Business Roundtable, “Business Roundtable redefines the purpose of a corporation to promote ‘an economy that serves all Americans’”, August 19, 2019

Images

Greta Thunberg poster.
Credit: Radu Stanescu/Unsplash

Capitalism. Time for a reset.
Credit: The Financial Times

Cyclist in Auckland, New Zealand.
Credit: Dan Freeman/Unsplash

WeWork logo on wall.
Credit: Ariann Laurin/Unsplash

Bosco verticale, Green in the city, Milan, Italy.
Credit: Chris Barbalis/Unsplash

Money changers

Harrison Jacobs, *Business Insider*, “One photo shows that China is already in a cashless future”, May 29, 2018

CBS News, “Sweden is going cashless”, May 5, 2019

Accenture, “Payments Pulse Survey: Two ways to win payments”, September 9, 2019

Tommy Wilks, *Reuters*, “Start-ups to grab \$280 billion in banking payments revenues by 2025, study says”, September 6, 2019

Barry Eichengreen, *The Guardian*, “Libra: will Facebook’s new currency be stopped in its tracks?”, October 14, 2019

Damon Beres, *Medium.com*, “The Apple Card explains everything you need to know about Apple today”, September 12, 2019

Jack Derwin, *Business Insider*, “Australia just got a new digital bank called 86 400 and its chair has a history of taking on the big end of town”, July 18, 2019

Monese, *About*

Emma Lunn, *The Guardian*, “Klarna: buy now, pay later system that is seducing millennials”, November 17, 2018

Jamie Redman, *Bitcoin.com*, “Africa’s interest in bitcoin remains high as 15 states plans to adopt the Eco currency”, July 2, 2019

Anthony Cuthbertson, *The Independent*, “China bans anti-blockchain sentiment as it prepares for launch of state cryptocurrency”, October 30, 2019

Gian Volpicelli, *Wired*, “What is Libra? Facebook’s cryptocurrency explained”, August 14, 2019

Richard Partridge, *The Guardian*, “France to block Facebook’s Libra currency in Europe”, September 12, 2019

Victor Cortes, *Conxto.com*, “MercadoPago and Xapo, two Latin American companies joining Facebook’s Libra Association”, June 19, 2019

The World Bank, “The Global Findex Database”

Will Ruddick, *The Green Political Foundation*, “How the Bangla-Pesa tapped the value of an informal community”, January 25, 2016

Ian Withers, *Reuters*, “Britain’s RBS launches digital bank Bó to take on start-ups”, November 27, 2019

Quentin Fottrell, *MarketWatch.com*, “Silicon Valley’s final frontier for payments: ‘The neoliberal takeover of the human body’”, October 23, 2019

Accenture, “Driving the future of payments 10 mega-trends”

Images

Apple Card.
Credit: Mark Solarski/Unsplash

Monese. Credit: Monese

Bó card. Credit: Bó

M-pesa agent in Kibera, Nairobi, Kenya.
Credit: Fiona Graham/WorldRemit

ATM.
Credit: Mirza Babic/Unsplash

Walking barcodes

Hal Hodson, *The Economist* – The World in 2019, “The face becomes a barcode”

The Guardian, “Smile to Pay: Chinese shoppers to turn to facial payment technology”, September 4, 2019

Mark Manning, *Mendix*, “Zurich FaceQuote goes from ide to app in week”, June 13, 2019

Steve Lepitak, *The Drum*, “Disney’s Dumbo and Accenture Interactive collaborate on the poster of the future,” March 10, 2019

Gulfnews, “India planning to set up one of the world’s largest facial recognition systems”, September 20, 2019

Bloomberg, *Gulf News*, “India planning to set up one of the world’s largest facial recognition systems”, September 20, 2019

Kyle Wiggers, *VentureBeat*, “AI Weekly: in China, you can no longer buy a smartphone without a face scan”, October 11, 2019

David Hambling, *MIT Technology Review*, “The Pentagon has a laser that can identify people from a distance – by their heartbeat”, June 27, 2019

Kate Conger, Richard Fausset, Serge F Kovaleski, *New York Times*, “San Francisco bans facial recognition technology”, May 14, 2019

Kaiyu Yang, Klint Qinami, Li Fei-Fei, Jia Deng, Olga Russakovsky, *Image-net*, “Towards fairer datasets: filtering and balancing the distribution of the people subtree in the ImageNet hierarchy”, September 17, 2019

Naomi Rea, *ArtNet*, “How ImageNet Roulette, an art project that went viral by exposing facial recognition’s biases, is changing people’s minds about AI”, September 23, 2019

Nicole Lindsey, *CPO Magazine*, “Amazon’s new smart products raise all kinds of Alexa privacy concerns”, October 9, 2019

Chris Baynes, *The Independent*, “Chinese schools scanning children’s brains to see if they are concentrating”, January 15, 2019

Khari Johnson, *VentureBeat*, “Facebook alters video to make people invisible to facial recognition”, October 25, 2019

Bernard Marr, *Forbes*, “The amazing ways Babylon health is using AIU to make healthcare universally accessible”, August 6, 2019

Salvador Rodriguez, *CNBC*, “Facebook agrees to acquire brain-computing start-up CRTL-labs”, September 23, 2019

Intel, “How 5G will transform the business of media and entertainment”, October 2018

5G *World Pro*, “SK Telecom to open 5G hospital in 2020”, May 6, 2019

Wired, “How 5G will supercharge business to work in real time”, August 8, 2019

Sidney Fussell, *The Atlantic*, “YouTube videos are a gold mine for health researchers”, September 9, 2019

Pyments.com, “Alipay to add beauty filters to facial recognition kiosks in China”, July 3, 2019

Seth Miller, *Paxex.aero*, “Biometrics expand in Asia, Europe and the Middle East”, October 9, 2019

Leon Kelion, *bbc.co.uk*, “Gatwick airports commit to facial recognition tech at boarding”, September 17, 2019

Jenni Reid, *Business Traveller*, “Facial recognition kiosk gives flight updates at Chinese airports”, March 27, 2019

Madeleine Hillyer, *World Economic Forum*, “World Economic Forum consortium launches paperless Canada-Netherlands travel pilot”, June 26, 2019

Images

People walking on crossing. Credit: Ryoji Iwata/Unsplash

Amazon Echo Loop. Credit: Amazon.com, Inc.

Customer uses facial recognition as identification at security checkpoint. Credit: John Paul Van Wert/Delta News Hub

Woman using Meitu’s makeup+. Credit: Meitu (video)

Portrait of woman with digital typography across face. Credit: Donny Jiang/Unsplash

Liquid people

Everlane, Black Friday Fund, 2019

Beth Desmond, *New Statesman*, “How gender fluidity went mainstream”, June 12, 2019

Eliana Dockterman, *Time*, “A doll for everyone: meet Mattel’s new gender-neutral doll”, September 25, 2019

Peter Johnson, *The HR Director*, “Rise of the freelancer – self-employed spikes as people seek flex”, June 11, 2019

Katharine Schwab, *Fast Company*, “These plant-based food companies are re-branding to target meat eaters – and it’s working”, July 25, 2019

Adele Peters, *Fast Company*, “Think fake burgers are just for vegetarians? 95% of Impossible Foods customers are meat eater” September 18, 2019

Robert Booth, *The Guardian*, “Vegan food becomes UK’s fastest-growing take-away”, August 28, 2019

Richard Moller, *YouGov*, “Is flexitarianism the diet of the future?”, March 26, 2019

Douglas Broom, *World Economic Forum*, “Sweden has invented a word to encourage people not to fly. And it’s working”, June 5, 2019

BBC, “Flight shame could halve growth in air traffic”, October 2, 2019

Miya Tokumitsu, *Jacobin Magazine*, “In the name of love”, December 1, 2014

Derek Thompson, *The Atlantic*, “Workism is making Americans miserable”, February 24, 2019

Julia LaRoche, *Yahoo*, “Starbucks to offer mental health service as new employee benefit”, September 5, 2019

United Nations, “World Population Prospects 2019”

European Commission, “2018 Ageing Report: Policy challenges for ageing societies”

United States Census Bureau, “Older people projected to outnumber children for the first time in US history”, March 13, 2018

Kerry Hannon, *The New York Times*, “My work life is over. What’s next?”, September 12, 2019

Images

Impossible bao. Credit: Impossible Foods

Snowy view from inside train carriage. Credit: Mike Petrucci/Unsplash

Mattel Creatable World dolls. Credit: Mattel

Plastic waste, MAAS, Lisbon, Portugal. Credit: Martijn Baudoin/Unsplash

Old woman laughing. Credit: Huyen Nguyen/Unsplash

Designing intelligence

Stitch Fix, Algorithms tour, 2019

Ciara O’Brien, *The Irish Times*, “Revenue turns into a digital bot to answer your tax queries”, September 6, 2018

Mark Samuels, *ZDNet*, “Successful IoT deployment: the Rolls-Royce approach”, May 15, 2018

Karen Nyawera, *HBS Digital Initiative*, “Fashion forward – using deep learning at ASOS to predict customer lifetime value in online fashion retail”, January 12, 2019

Silvia Amaro, *CNBC*, “Sell-offs could be down to machines that control 80% of the US stock market, fund manager says”, December 5, 2018

Ben Evans, *Benedict Evans*, “Machine learning deployment”, October 4, 2019

Wired, “A health care algorithm offered less care to black patients”, October 24, 2019

Jeffrey Dastin, *Reuters*, “Amazon scraps secret AI recruiting tool that showed bias against women”, October 10, 2018

Ron Schmelzer, *Forbes*, “What happens when self-driving cars kill people?”, September 26, 2019

Aja Romano, *Vox*, “A group of YouTubers is trying to prove the site systematically demonetizes queer content”, October 10, 2019

Louis Columbus, *Forbes*, “80% of enterprises are investing in AI today”, October 16, 2017

Governanceai, “Artificial intelligence: American attitudes and trends”, January, 2019

Mareike Möhlmann and Ola Henfridsson, *Harvard Business Review*, “What people hate about being managed by algorithms, according to a study of Uber drivers”, August 30, 2019

John Pavlus, *Quanta Magazine*, “His Artificial Intelligence sees inside living cells”, July 24, 2019

Connor Upton, *Design Voices*, “Computers have eyes, but where’s the vision?”, April 16, 2018

Devon Delfino, *Business Insider*, “How to use Google Lens to identify objects and learn more information using your camera and Google Assistant”, September 10, 2019

Pluralsight, *Iris*

Miranda Bryant, *The Guardian*, “Instagram’s anti-bullying AI asks users: ‘Are you sure you want to post this?’”, July 9, 2019

Gregg Schoenberg, *TechCrunch*, “Tally’s Jason Brown on fintech’s first debt roboadvisor and an automated financial future”, June 19, 2019

Gayang Ho, *Global Railway Review*, “Artificial Intelligence in rail: hype or reality?”, May 15, 2019

Charlotte Jee, *MIT Technology Review*, “DeepMind has made a prototype product that can diagnose eye diseases”, April 1, 2019

Alex Hickey, *CIO Dive*, “AI sits in on Salesforce’s board meetings and has something to say”, January 26, 2018

Barry Libert, Megan Beck, and Mark Bonchek, *MIT Sloan Management Review*, “AI in the boardroom: the next realm of corporate governance”, October 19, 2017

Finch 3D, Design tool for architects

Sebastian Jordahn, *Dezeen*, “Philippe Starck, Kartell and Autodesk unveil ‘world’s first production chair designed with artificial intelligence’”, April 11, 2019

MakerInsights, Product decision engine for retail

Klydo.ai, 2019

Nuritas.com, 2019

Rima Sabina Aouf, *Dezeen*, “Start-up Atolla harnesses AI to make personalised skincare products”, September 3, 2019

Matthew Hutson, *Quanta Magazine*, “Computers evolve a new path toward human intelligence”, November 6, 2019

Daniel Shapiro, *Forbes*, “Can artificial intelligence generate corporate strategy?”, August 19, 2019

Images

Skin Health System kit. Credit: Atolla

Train station employee, Tokyo Station, Chiyoda-ku, Japan. Credit: Victoriano Izquierdo/Unsplash

AlphaStar and StarCraft II gameplay. Credit: DeepMind and Blizzard

Woman with hologram data on wrist. Credit: Justin Peralta/Unsplash

A.I. chair. Credit: Kartell

Digital doubles

Brian Buntz, *IoTWorldToday*, “Of custom shoes and bottles: digital twin technology grows up”, May 1, 2018

Paul Sawers, *VentureBeat*, “Tencent leads \$10 million investments in SenSat to create real-time simulated realities”, October 1, 2019

CIO&Leader, “Digital twin revenues to rise by 2023, boosted by AI and ML innovation”, April 12, 2019

Grand View Research, “Digital twin market size worth \$26.07 billion by 2025”, December 2018

Druhti Shah, Kerry Allen, *BBC*, “Chinese vlogger who used filter to look younger caught in live-stream glitch”, July 30, 2019

Ephrat Livni, *qz.com*, “Voice skins will make the internet a freer – but more dangerous – place”, May 21, 2019

Paige Leskin, *Business Insider*, “People are loving the new gender-swapping Snapchat filter, and it’s not being used to catfish unsuspecting men on Tinder”, May 15, 2019

Mackevision, “Automobil Industrie – Partners of Digitization: Mackevision on Digital Twins”, April 11, 2019

Camasutraindustries.com, 2019

Justin Kirkland, *Esquire*, “This porn company wants to use Virtual Reality to keep you alive forever”, May 31, 2018

TheDiigitals.com, 2019

BBC, “Avatars, are we ready for our digital twins?”, October 28, 2019

Ed Hackworth, *Computer Business Review*, “Why the digital twin is the key to customer loyalty”, May 14, 2019

Arielle Pardes, *Wired*, “The emotional chatbots are here to probe our feelings”, January 31, 2018

Ameila Tait, *The Guardian*, “What happens to our online identities when we die?” June 2, 2019

Accenture, “More responsible use of workforce data required to strengthen employee trust and unlock growth, according to Accenture report”, January 22, 2019

Eric Rosenbaum, *CNBC*, “IBM AI can predict with 95% accuracy which workers are about to quit their jobs”, April 3, 2019

Lisa Lacy, *AdWeek*, “3 ways CX is about to drastically change”, September 4, 2019

Will Grimond, *The RSA*, “Why can’t I move my data?”, September 11, 2019

Don Tapscott, *qz.com*, “We’re living in an era of digital feudalism. Here’s how to take your data and identity back”, September 11, 2019

Fatemeh Khatibloo with Mary Pilecki, Shar VanBoskirk, Joe Stanhope, Matthew Flug, Christine Turley, *Forrester*, “The algorithm of you: meet your personal digital twin”, September 10, 2018

Datatransferproject.dev, 2019

3ds.com, “The Living Heart Project”

Hannah Martin, *Stuff*, “Auckland researchers build virtual lungs to better diagnose and treat patients”, July 8, 2019

The Times, “I’m dealing with motor neurone disease by becoming a cyborg”, August 3, 2019

Andy Greenberg, *Wired*, “An AI that reads privacy policies so you don’t have to”, September 2, 2018

NDA Lynn.com, 2019

Awario, Instagram

Natt Garun, *The Verge*, “One year later, restaurants are still confused by Google Duplex”, May 9, 2019

Natt Garun, *The Verge*, “Google is bringing Duplex to the web to help book car rentals and movie tickets”, May 7, 2019

Images

Woman looking up into mirror.
Credit: Vale Zmeykov/Unsplash

Credit: Eternime

Galaxia. Credit: The Diigitals

The Living Heart Project.
Credit: Dassault Systèmes

Two people wearing pink wigs.
Credit: Chan/Unsplash

Life-centered design

Gerry Scullion, *This is HCD*, “John Thackara ‘Designing for all of life, not just human life’”, October 23, 2018

Beautycounter.com, 2019

Cfenterprises.org, 2019

Dominique Vidalon, *Reuters*, “French group Danone’s venture capital fund eyes 20-25 year deals by 2020”, June 22, 2018

Laura James, *Forbes*, “Impossible Burger to finally make its grocery store debut – but will excitement match its Burger King launch?”, September 19, 2019

Solve, Saathi solution

Fairphone.com, 2019

David Blanchard, *Unilever*, “We’re introducing reusable, refillable packaging to help cut waste”, January 24, 2019

Renaë Reints, *Fortune*, “The resale market is taking over fast fashion, report says”, March 19, 2019

Stuffstr.com, 2019

Nudiejeans.com, 2019

Susan Devaney, *Vogue*, “You can now rent GANNI’S cult Scandi designs”, September 21, 2019

Daniela Esnerova, *Money Marketing*, “BlackRock launches ESG tax-transparent funds”, July 17, 2019

Mater Design, 2019

Roddy Clarke, *Forbes*, “Transparency is what conscious consumers urgently need from design brands today”, April 27, 2019

Sarah Young, *The Independent*, “Dr Martens’ profits soar by 70 percent over success of new vegan range”, August 13, 2019

Designboom “Snøhetta completes the world’s northernmost energy-positive building in Norway”

Winnow Solutions, “IKEA and Winnow are building the kitchen of the future”

Leyla Acaroglu, *Medium*, “Tools for systems thinkers: the 6 fundamental concepts of systems thinking”, September 7, 2017

Welum, “The Textile of the Future: Pinatex”

Images

Designers in Fjord Tokyo studio.
Credit: Fjord Tokyo

Home office.
Credit: Gabriel Beaudry

Person walking on wooden edge.
Credit: Kilian Photo/Unsplash

Snøhetta Powerhouse
Brattørkaia, Trondheim, Norway.
Credit: synlig.no

Person hugging tree.
Credit: Will Cornfield/Unsplash

Disclaimer third parties

This document makes descriptive reference to trademarks that may be owned by others. The use of such trademarks herein is not an assertion of ownership of such trademarks by Accenture and is not intended to represent or imply the existence of an association between Accenture and the lawful owners of such trademarks. This document is produced by professionals at Accenture as general guidance. It is not intended to provide specific advice on your circumstances. If you require advice or further details on any matters referred to, please contact your Accenture representative.

Copyright ©2019 Accenture. All rights reserved. Accenture and its logo are trademarks of Accenture.

FJORD™
Design and Innovation from
Accenture Interactive

Fjord, part of Accenture Interactive, is a design and innovation consultancy that reimagines people's relationships with the digital and physical world around them. We use the power of design to create services people love. By combining a human-centered approach with robust methodology, we work with some of the world's leading businesses to make complex systems simple and elegant. Founded in 2001, Fjord has a diverse team of 1,200 design and innovation experts in 33 studios, including Atlanta, Auckland, Austin, Barcelona, Berlin, Bogotá, Buenos Aires, Canberra, Chicago, Copenhagen, Dubai, Dublin, Helsinki, Johannesburg, Lima, London, Los Angeles, Madrid, Melbourne, Mexico City, Milan, New York, Paris, San Francisco, São Paulo, Seattle, Singapore, Stockholm, Sydney, Tokyo, Toronto, Washington, D.C. and Zurich.

To learn more, follow us @fjord
and visit www.fjordnet.com.

Accenture Interactive

Accenture Interactive helps the world's leading brands transform their customer experiences across the entire customer journey. Through our connected offerings in design, marketing, content and commerce, we create new ways to win in today's experience-led economy. Accenture Interactive is ranked the world's largest digital agency in the latest Ad Age Agency Report for the fourth year in a row, and was named a 2019 Most Innovative Company in Advertising by Fast Company.

To learn more, follow us @AccentureACTIVE
and visit www.accentureinteractive.com.

accenture

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialized skills across more than 40 industries and all business functions — underpinned by the world's largest delivery network — Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With 492,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives.

Visit us at www.accenture.com.

trends.fjordnet.com