GREENWOOD CAMPBELL

PRESENTS

THE HUMAN GUIDE TO TECH

SUMMER EDITION

2021

Who are
GREENWOOD CAMPBELL

Our Purpose is to make people's lives better.

We work with brands and organisations that do this every day.

We use empathy, data and tech to create engaged audiences. We design and build award winning websites, transformational apps, inspirational voice skills and game-changing chatbots.

The digital experiences we build save lives at sea, keep Britain's rail networks safe, help people find the right doctor, inspire people to get fit and healthy, bring fans closer to the game they love, make technology simple and transform access to education.

WE ARE GREENWOOD CAMPBELL, THE HUMAN TECH AGENCY.

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Introduction

It goes without saying that 2020 disrupted our personal lives, businesses and relationships more than we could have ever imagined. Under lockdown, we've learned how to work from our kitchen tables, see our friends only virtually with tools like Zoom, and support each other from afar. As we start to see the light at the end of the theoretical tunnel, the disruption has really only just begun.

Covid-19 continues to test our resolve and our resilience. Exponential technologies like artificial intelligence, synthetic biology, autonomous robots, and lab grown meat are challenging our assumptions about human potential.

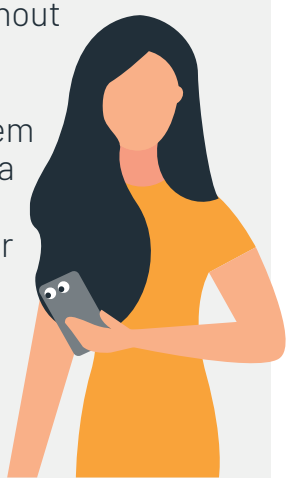
THE PANDEMIC IS ACCELERATING THE RISE OF THE DIGITAL ECONOMY

It's still too early to know how profoundly coronavirus will change our societies, but it's clear we'll be living with the shockwaves for years to come. This pandemic will alter the course of history in ways we can't predict just yet but one thing has been evident, the prevalence for 'digital first'. The pandemic is a reality check for businesses that have been reluctant to embrace digital transformation and now find themselves woefully unprepared. On the other hand, businesses that had not only developed digital strategies but executed on them prior to the pandemic are now in a position to leapfrog their less nimble competitors.

The Human Guide to Tech 2021 is the third edition in the series with the previous guides being downloaded by over 5000 different people across all kinds of industries. The guide is designed for forward thinking, leading organisations who understand the importance of staying close to digital and planning strategically.

Look out for QR codes like this throughout the guide.

Simply scan them with the Camera App on your Smart Phone for extra content.



Why is it vital for brands to track and embrace new trends?

Strategic foresight reduces uncertainty about the future. It's about preparation, not predictions.

Foresight is a strategic activity that uses quantitative and qualitative data, frameworks and tools to build plausible visions of the future so that management can make informed decisions today.

THINK EXPONENTIALLY.
ACT INCREMENTALLY.

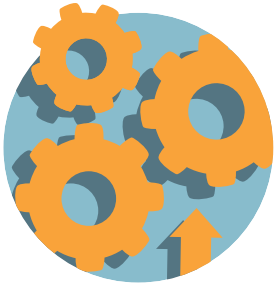
FORESIGHT CREATES VALUE

33% HIGHER PROFITABILITY

Companies with a dedicated strategic foresight methodology and resources outperformed the average by a 33% higher profitability.

200% GROWTH

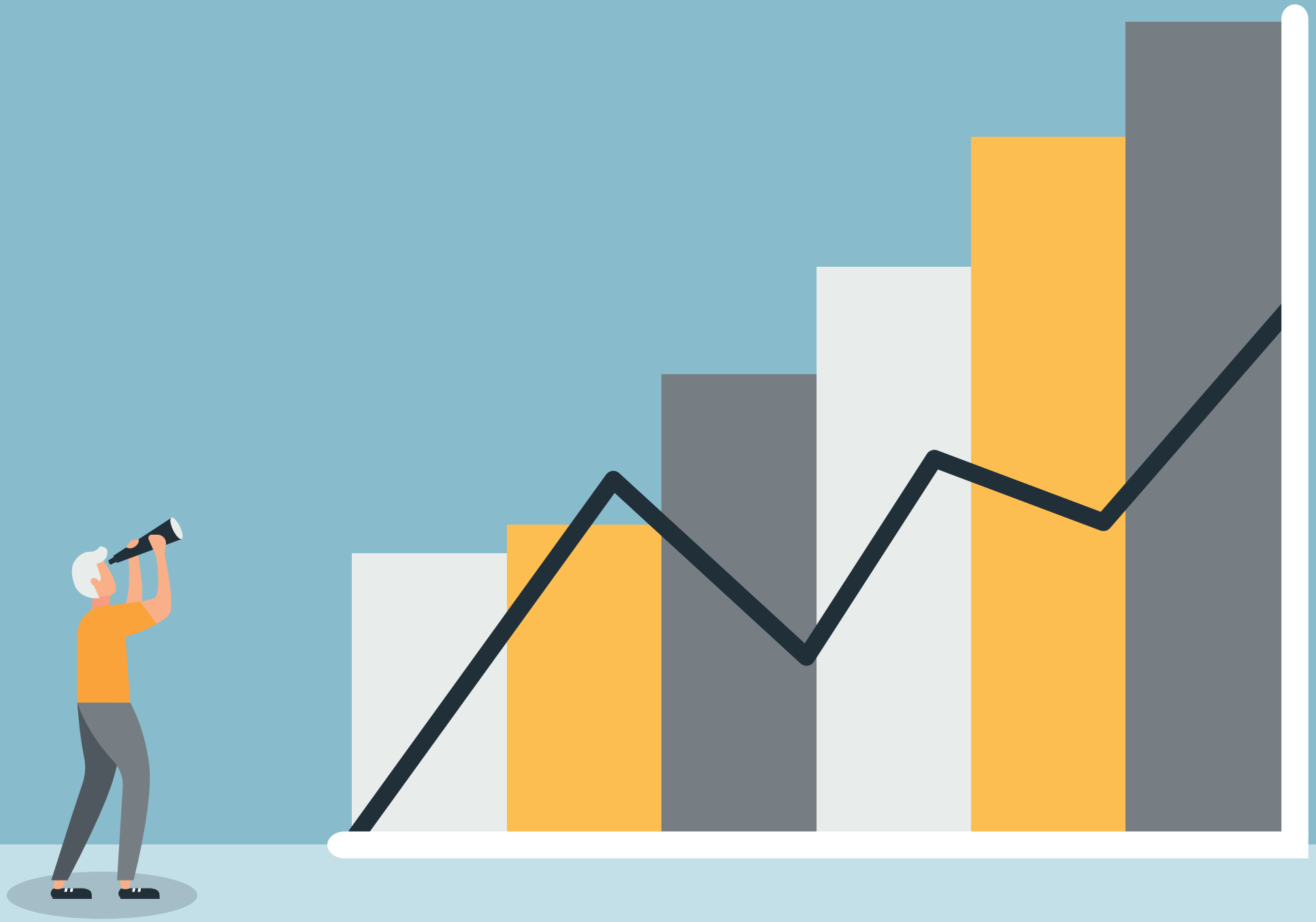
Companies with a dedicated strategic foresight methodology and resources outgrew their competitors 200%.



25% IMPROVEMENT

Companies say that strategic foresight improves business objectives and planning, helps define new markets, and builds flexible mindsets among executives, even in times of deep uncertainty.

Lots of organisations get stuck between 'business as usual' and adapting to future trends, and this makes them vulnerable to disruption. If you aren't constantly reviewing and evolving, another organisation will get there first, serving your customers better than you can.



The Subscription Economy

Gemma Bianchi

Meet Ella, a 25 year old Graphic Designer.

She has a car but doesn't own it.
She works but doesn't have a job.
She loves movies but doesn't own a DVD or BlueRay. She loves to cook but never goes shopping.

How? She's one of the millions that are part of the 'Subscription Economy'.

WHAT IS IT

In a subscription model, customers are charged on a recurring basis, usually monthly, for a product or service. Typically, they can choose how long and how often they want to receive each order and most subscriptions provide the option to renew or cancel at any time.

Subscriptions used to be reserved for products like magazines and services like the gym but this type of business model has become increasingly popular with consumers.

While millennials unsurprisingly lead the way (31% currently subscribed and another 38% planning to in the next six months), even baby boomers are signing up. Although only 8% of baby boomers currently subscribe, 22% plan to do so in the next six months. (Forbes)

THE RISE IN POPULARITY

There is a tipping point emerging in modern commerce.

Why? Because consumer preferences are shifting globally. In fact, recent research from Zuora found that 71% of adults across 12 countries have subscription services and 74% believe that in the future, people will subscribe to even more services and own less physical goods.

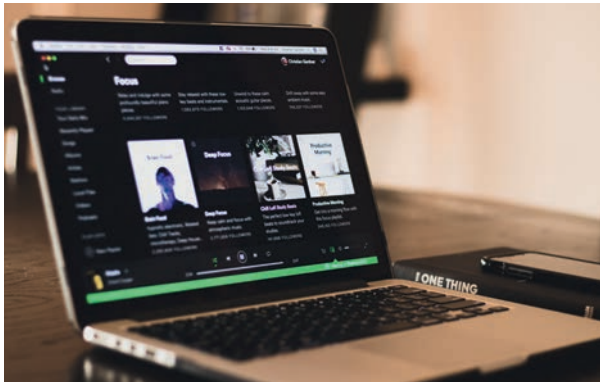
There are three major reasons why consumers choose to sign up to subscriptions: **convenience, price,** and **personalisation.**

These profound changes should raise questions within your organisation:

- What do we need to do differently to meet the needs of the customer of the future?
- How will our value proposition and business model need to change?
- How do we stay relevant to customers like Ella?

The major players

SPOTIFY



Another that needs no introduction, Spotify changed the game in 2006 when they launched. By March 2011, Spotify announced a customer base of one million paying subscribers across Europe, and by September 2011, the number of paying subscribers had doubled to two million. In August 2012, Time reported fifteen million active users, four million of those being paid subscribers. Spotify has revolutionised how we consume music. Their popularity marked the music industry's shift from physical to digital, to embracing the internet rather than fighting it.

TAILS.COM (NESTLE)

Tails.com is an online pet nutrition service that provides tailor-made food for dogs. Each month it delivers a bag of food individually designed directly to the customer.

The company was early to identify changes in the way consumers want to shop and care for their pets, and married digital technology, food innovation and new manufacturing techniques to provide food individually tailored according to factors such as a dog's age, breed, size and level of activity.

GRIND

A brand on a mission to help the planet with organic and sustainable products, they offer a monthly coffee subscription to all the caffeine lovers with a conscience out there. Build your own delivery and pick how much you'd like and how often. Plus, you can skip, pause or cancel your subscription anytime, with no fuss.

JAGUAR LAND ROVER

JLR introduced their subscription service in 2018. Customers pay a monthly fee to 'lease' a vehicle and will get a new one every six months. That fee covers everything from road tax and servicing to insurance and roadside assistance. The ultimate in convenience. They offer four different packages depending on customer needs.

NETFLIX

This one really does not need any explanation. Launched in 1997, they started to get noticed 10 years later when the streaming service started. Netflix had 203.67 million paid subscribers worldwide as of the fourth quarter of 2020 and they are quite often held accountable for the demise of Blockbuster who failed to adapt to the changing digital times.

GOUSTO

Gousto is a recipe box company launched in 2012. The premise is to 'make it joyfully simple to create delicious meals at home', and meal prep boxes arrive with ready-measured, fresh ingredients and easy-to-follow recipes. They claim to source produce carefully, using 100% British meat and seasonal British vegetables. You select between 2 - 4 meals per week for up to four people.

NIKE

Arguably the world's greatest trainer brand, Nike recently launched its Nike Adventure Club, a sneaker subscription service for kids aged two through ten . The company says it's using the service to test out the subscription market before expanding it to runners and other athletes who need to replace their shoes frequently.

And it's not just the big players that offer subscriptions to consumers. You can join a subscription for 'bacon of the month', sock subscriptions, personalised outfits based on your style, wine clubs, adult crafts and razors.

THE OPPORTUNITY

The pandemic has undoubtedly accelerated the trend of subscription-based models.

Before the pandemic started, subscription services were steadily on the rise. It's a trend, driven by consumer demand, that has been growing in popularity for many years. But when the Covid-19 outbreak forced businesses to work remotely and consumers to rethink their lifestyle habits – such as travel, hospitality and leisure activities – many subscription-based businesses soared amid the huge demand for digital services

Companies should love the subscription model because they represent guaranteed monthly revenue, easier planning and forecasting and potential growth.

EXAMPLE

Organisations like Uber who have already completely disrupted the travel market could charge a nominal fee each month for unlimited rides. I tested this concept on LinkedIn with a theoretical concept. £160 a month, unlimited rides, minimum 6 month term.

A lot of feedback was geared towards performance and service levels, ensuring these didn't suddenly drop as a result of increased use. As expected, some users did not want to be tied into a 6 month contract.

CONCLUSION

Subscriptions offer a whole area of untapped opportunity for brands who are yet to venture into this space.

If you're thinking about introducing subscriptions to your product or service, there are some key points you should consider.

- Logistically, what alterations or considerations would you need to make to your organisation before creating a subscription? More staff, more inventory?
- How do you ensure service levels and customer satisfaction are maintained?
- Is your offering personalised to each customer? Can they select the ingredients that work best for them? Or the frequency of their delivery?
- No-commitment. Forcing customers to sign up for 12 months can be a total turn off. Can you give them ultimate flexibility? If your product is great, they'll stay.
- Exclusivity. Customers want to feel like they have access to something they wouldn't otherwise be able to get their hands on.
- Are you offering convenience or improving your customers' life in some way? If not, why would they bother?

Subscription businesses that leverage their customer data and trends to experiment and improve their offerings – whether they're technology providers, traditional retailers, manufacturers or service providers, will gain a greater understanding of their customers buying habits and will be better positioned to grow and scale.

It's these businesses that will ultimately win in the subscription service economy.

How science is saving the world

Kayley Doyle

The pandemic's disruption on our personal and professional lives is hard to quantify. This time last year, it was impossible to foresee how the next year would unfold. However, there have definitely been plenty of lessons learned from the crisis, particularly from a technology perspective. Acting as a catalyst to some incredibly significant changes, the pandemic drove the continuing evolution and importance of data, analytics and, in particular, artificial intelligence (AI).

Before COVID-19, AI was often seen as an important space to pursue, but at times, lacked corporate buy-in. The past year however has provoked a complete paradigm shift. AI is now at the forefront of many businesses, and is continually proving itself to be an essential asset to reach customers, maintain operations, and for people to function efficiently within their day-to-day lives.

WHAT IS ARTIFICIAL INTELLIGENCE?

Many misconceptions exist around AI. Amy Webb from the Future Today Institute states that "Artificial intelligence represents the third era of computing, generally defined as the ability for a machine to perform cognitive functions as well as or better than humans". Such functions can range from perception, to learning, reasoning and even contextual understanding and exercising creativity. However, with current capabilities, Skynet is luckily a long way off (for now).

AI SPEEDS SCIENTIFIC DISCOVERY

So, where does AI tie into the pandemic, and why? There was plenty of uncertainty in the air whilst COVID-19 vaccines were seemingly rushed onto the market towards the end of last year. Artificial intelligence played a huge role by aiding and augmenting the speeding of scientific discovery. Much of the scientific leg work that goes into any medical or lab discovery often isn't glamorous - experiments with several, minute variables often require equally minute tweaks to measurements, materials, and inputs. Speak to any chemistry or biology graduate student about the hundreds of tedious hours repeatedly making small adjustments until they finally find a solution.

Enter, AI - many research labs around the world now utilise the array of tools AI systems now convey, exponentially accelerating the process of scientific discovery, and many in the last year have had the same singular goal; researching, treating and curing Covid-19.

In one astonishing result, an international team crowdsourced a Covid antiviral by synthesizing candidates for 2,000 molecules in less than 48 hours - a process that likely would have taken human researchers months. Now, nearly every major pharmaceutical company has deals with AI drug discovery startups, including Johnson & Johnson, Novartis, Merck and AstraZeneca. All names that have become increasingly familiar in recent months. AI will without a doubt make drug development and clinical trials more efficient overall, leading to a drop in drug prices, more personalised medicine, and hopefully, a new revolution in medical discovery.

Even just earlier this month Tech giant NVIDIA teamed up with pharmaceutical company AstraZeneca on new AI research projects aimed at boosting drug discovery and patient care.

It isn't all perfect however, and the use of algorithms in drug discovery can raise some serious ethical issues. AI could have the potential to be used in taking shortcuts and perhaps undermining the value of science being conducted in the laboratory. In addition, bias could take place leading to the marginalisation of certain patients or diseases. Ultimately, while AI can increasingly complete tasks exponentially quicker than humans, they're only as 'smart' as we design them. Perhaps it's a case that the algorithms themselves need their own clinical trials.

AI FOR VACCINE ROLLOUT

When it comes to COVID-19, as I'm sure everyone in the UK (and around the world) has experienced, it sometimes seems that every silver lining has a cloud. It soon became clear that, although we soon had the highly effective vaccines available, we then lacked the smart infrastructure needed to get them to the people who needed them most. With many countries struggling to get things moving, it is becoming clear that we need something new to help accelerate our efforts.

One promising approach is AI systems helping to steer our vaccination programs. "Humans don't have the capacity to consider thousands of competing and evolving factors," said Arijit Sengupta, who is the Founder and CEO of Aible. "This is precisely what AI does best—that is, complex scenario planning and hypothesis testing that's flexible enough to adjust quickly to new information so that decisions can be made based on the best available evidence."

Adam Odeskky, co-founder of Sensely in San Francisco, outlines that, "Companies such as IBM are now using machine learning technologies to help healthcare systems understand their patient demographics, identify high-risk populations, and factor in vaccine-availability modeling to figure out smarter ways to distribute available doses. AI tools are also being used to help streamline the supply chain and speed up production and transportation of doses."

Still, the technology isn't fool proof. Stanford Medical Center drew criticism late last year after it emerged that its distribution algorithm had assigned vaccines to just seven out of more than 1,300 frontline doctors. "Our algorithm, that the ethicists, infectious disease experts worked on for weeks ... clearly didn't work right" one administrator admitted. Find out what went wrong.

AI FOR EMPOWERING A POST COVID-19 WORLD

Equally, with every new 'cloud' that crops up, there still may be light at the end of the tunnel. Beyond the vaccines, AI will play a major role by helping to continue to limit the spread of infection and boost the efficiency of organisations in a post pandemic society.

On public transport systems, AI and machine learning can be taught to identify and monitor the path of potential carriers of transmissible diseases. By doing simple tasks such as screening the temperature of passengers, AI can provide individual transport operators across different modes of transport with real-time information. If somebody were to take the bus to the train station, then jump on the 2:30 to Waterloo, AI can be designed to know. This allows operators to identify certain risks and deploy additional cleaning protocols, or, if necessary, reduce or stop the relevant service.

AI may also be employed to measure and monitor the occupancy of people in stores and restaurants, and alert public health authorities to excessive crowds in public areas. They can achieve this by feeding images from existing government and commercial CCTV cameras into a centralized AI platform.

On the business side, investment into AI platforms has skyrocketed across the pandemic, shifting from a "nice to have" to a necessity. The disruption to "business as usual" exposed that existing resources and processes could not scale to meet increasing demands; one airline saw cancellation requests explode from an average of 500 per day to 4,000. Without automation, companies could not have achieved the speed and scale required and maintained their relationships with customers.

> **Investing in AI tools can improve profitability in a moment when many businesses are doing more with less**
>
> Brian Solis,
> Global Innovation Evangelist at Salesforce

WHAT MIGHT THE FUTURE LOOK LIKE?

> **The convergence of groundbreaking research, business use cases, the explosive growth of data, and improvements in computing power and storage are enabling advances in AI. The global artificial intelligence market is expected to grow at a compound annual growth rate of 42.2% from 2021 to 2027.**
>
> The Future Today Institute

It is clear this is only the beginning for the growth and transformation of Artificial Intelligence and it is already proving itself to be a key player in the (very near) future. Scientists are already building AI systems to identify where the next novel coronavirus could emerge, having already predicted many more potential hosts of new virus strains than have previously been detected.

The tools in the AI toolbox may truly be endless for business, providing longer-term opportunities to unlock new sources of value and drive growth. In the future, companies continuing to invest in the technology can use AI to reimagine business processes and operational models altogether, consistently finding new ways to measure and deliver real-time value.

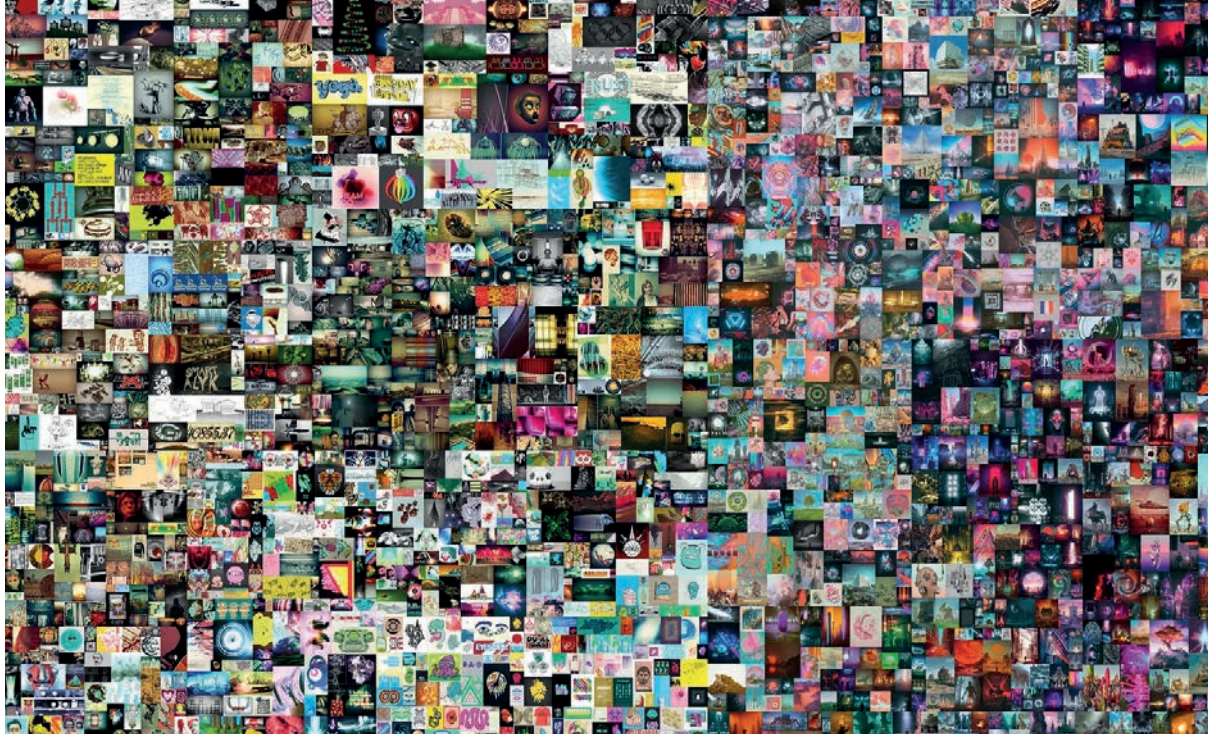
Now entering the second year of the pandemic, many of the ways AI has solved what we imagined should be short-term issues, have now shown their long-term value. Utilising AI to augment systems to work faster, more accurately and efficiently has been nothing short of transformational, but it is likely that its journey has only just begun.

Why would you spend $69m on digital artwork?

Marek Miś

This image right here was sold for $69 million.

No, it wasn't a version printed on canvas made with gold, and no, it's not Da Vinci's or Pollock's artwork either. It's a digital artwork, which in fact you can download and set as your desktop wallpaper for FREE.



DEMYSTIFYING NFTS

The selling transaction was made possible thanks to a technology called NFT - short of "non-fungible token." If you follow digital trends, there's a good chance you know this already, but in case you don't, we did the homework for you trying to find the easiest way to explain what NFTs are:

"If downloading an image from the internet to your phone is like buying a reproduction of a Picasso painting, owning the NFT of that image is like owning the original Picasso."

"NFTs are basically blockchain tokens representing a unique digital item."

"Non-fungible tokens (NFTs) are digital assets that are provably unique, creating digital scarcity. They can't be duplicated or divided. They have many use cases, including for digital collectibles, music, artwork, and in-game tokens."

"What sets NFTs apart from cryptocurrencies (which are fungible tokens as they are identical to each other) is that they have unique identification codes and metadata to distinguish one NFT from another."

We like this one the most:
"NFT is like a unique digital certificate tied to a unique digital asset."

Now this makes a bit more sense, especially when combined with a thought of collecting stuff, or the idea of a legal and confirmed ownership of an asset. This ownership is registered in a blockchain...yes, that weird type of database technology that no one truly understands, yet millions of people invest in it with their hard earned (and real), money.

And what can be an asset? Literally anything digital, from a graphic, video or audio file, to a tweet.

A tweet? Yes. A post on Twitter. Like this one from the founder of Twitter itself, Jack Dorsey. His first ever tweet has been sold for $2.9m...

WHO IS THIS FOR?

Everyone can join the NFT movement. Speaking top-level, there are two main roles you can adapt: a role of a creator and/or a collector.

Creators must have something tangible to sell, something unique, be famous already or be described as a rising star, having potential for their artwork to be valuable in years to come.

A collector on the other hand is more of a personality attribute. A willingness to gather unique, exclusive items, and that sense of ownership is something we all have in our genes. That's what's been fuelling the world of art and broadly speaking collectibles, ever since humans learned how to create first items.

Now, if we start observing NFTs from a business perspective, things become very attractive, especially for brands in retail. NFTs create digital scarcity. And scarcity, as the economic principle goes, creates value.

LIMITED EDITION OF EVERYTHING

Scarcity sells for a higher price. And usually it gets higher with time.

Brands are already jumping in the NFT realms attracting masses of attention from the mainstream audience, finding novel use cases of this technology.

For example:

The NBA's Top Shot NFT product (a blockchain-based trading card system) generated over $230 in gross sales.

Nike came up with a patent for their blockchain-compatible sneakers, CryptoKicks. When you buy a pair of these shoes, you'll also receive a digital asset attached to a unique identifier. When the sneakers are sold to someone else, ownership can be transferred by trading both the real shoe and the associated digital assets. These digital assets can be stored in what's being called a "Digital Locker," a cryptocurrency wallet type app.

Fashion brands like Gucci and Louis Vuitton are exploring NFTs to help verify the authenticity of luxury items and trace the whole journey of the lifecycle from an alligator farm to the store where it was sold for the first time, and then the multiple chains of owners that have owned and sold it.

SHOULD I GET ON BOARD WITH NFTS?

Who knows what the future brings for NFT. At the time of writing this article it seems like we're high on the hype curve. Some people look at NFTs as a long-term investment. Some try to get rich by trading animated gifs, others do it for the thrill of bidding and winning. With the right assets in place and understanding the risks, it's worth using the hype as a catalyst, as there might not be another chance to do it on that scale.

Whether or not NFTs are here to stay, one thing is for sure - blockchain technology is evolving and continues to change the perception of value in money and ownership.

Sustainability in the cloud

Tris Tolliday

Let's talk about the elephant in the room. It's 2021, and we are in the midst of both a climate crisis, and a global pandemic (made more likely to happen by said crisis).

By 2030, it is estimated that the tech industry (ICT) will account for between 8 and 20% of the global electricity supply. It's on par with aviation in terms of current carbon footprint, the swathe of digital devices, data and networks is unfathomably large.

As a business, where and how you host your websites, servers, and applications makes a real difference to both your energy consumption, and carbon footprint. Geography makes up as much a part of your carbon footprint as your cloud provider. Even the time of day you use your resources can make a significant difference.

So what are the top ways to reduce your footprint, while still having cutting edge technology at your disposal?

PICK YOUR LOCATION

Where you host your data is directly related to what energy is available to your datacenter. Countries with a higher percentage of renewable energy on their grid, have more to provide to the cloud operator, and therefore have a lower carbon footprint.

For example Belgium and Finland are great examples of European regions where GCP get over 70% of their energy from low carbon infrastructure.

EACH CLOUD IS DIFFERENT

Moving to the cloud will almost always be more efficient than self hosting, the economy of scale allows for micromanagement of power use, but each cloud offers different specialties.

GOOGLE CLOUD PLATFORM

While GCP (Google Cloud Platform) has been Carbon Neutral since 2007 (Meaning they offset for any carbon they do use), they still have a long way to go before they become true 'Net Zero' (100% of energy coming from 100% renewables, 100% of the time) in 2030.

MICROSOFT AZURE

Microsoft has promised to become Carbon Negative by 2030, meaning after that point they will be removing carbon from the atmosphere as they operate, ultimately aiming to remove all carbon emitted since their 1975 founding by 2050. Their annual emissions hit 16 million tonnes in 2021, but similarly, they have been offsetting these since 2012.

If you are currently using Microsoft Azure, they have a calculator in preview to show your footprint on their platform.

AMAZON WEB SERVICES

Very much at the back of the pack, Amazon is kicking their heels, pledging to become carbon neutral by 2040. As Amazon accounts for 31% of the cloud, this may just be too little too late. However, they are currently offsetting some of their most popular regions including Frankfurt, and Ireland.

GO SERVERLESS

Many modern web applications can now be run on serverless architectures, they go by many names (serverless, functions, cloud run etc), but they share key core benefits for business.

As serverless apps start and stop with demand, and tend to be billed by seconds of use, most applications can benefit from saving money and only use the resources that they need, which in turn drives down footprint. With a generous free tier on all cloud platforms, smaller projects will often fall into the monthly free zone.

PICK YOUR TIMING

If your application doesn't need to run 24/7 (think data crunching and machine learning rather than websites) you can build your workloads to accommodate interruptions and scheduling by your cloud provider to only operate during off peak hours.

Once again this will not only save you money on running costs, you can also utilise known times when renewable energy is abundantly available. Doubling up on this, you will also save energy networks from using surge power plants that tend to be gas powered.

STATIC IN THE AIR

Running a 'brochure' website? If the content doesn't regularly change (more than say, twice a day) consider a static website. These sites can still be engaging and have some dynamic content, but unlike traditional websites, they are built ahead of time and served from a CDN (content delivery network). Users will benefit from blazingly fast load times, and your organisation will be running a highly optimised, super lightweight, and efficient website, with minimal hosting cost, and reduced impact.

OFFSET THE REST

Once you have reduced and calculated your impact, until your organisation reaches Net Zero, there is going to be a figure for your emissions. Offsetting sits as an option when all other routes have been exhausted, as they tend to have deferred impacts, and don't directly address the issues of today. If you opt to offset, consider a well established certified provider, to ensure your funds are going to a worthy project.

THE WATCHER ON THE WALL

All that is left to do is monitor and refine, an ongoing process that is central to any digital project.

By cleverly using modern infrastructure in the cloud, your organization can have a considerable impact on curtailing its carbon footprint. As we seek to address our impact on the world, seemingly innocuous changes can have the biggest repercussions.

Many remedies will have a knock on improvement for users of your digital infrastructure, and a cost reduction to your organization. Sustainability really can be a triple win.

Digital inclusion not just for the elderly

Amethyst Corley

"Will you play with me?"..... "No, go away"

Most people can relate to the age-old 'meanie' kid things that happen on the school playground of being excluded. And whilst most parents would like to personally address any child who is mean to their little ones it is a complex and universally human experience - this exclusion... and one not easily solved. It applies to every aspect of human life, work, sport, school and what we are discussing here is the digital sphere. Simply taking a hammer to it will not solve it.

ACCELERATING RELIANCE ON DIGITAL ACCELERATES DIGITAL EXCLUSION

With the world trying to limit face to face interactions as much as possible right now, it was a natural progression to move as many services to digital and minimise COVID risks, and this is one of the many reasons the pandemic has exponentially increased reliance on technology. And sensible though this is, the gaping void between the 'tech-haves' and 'tech-have-nots' is all too clear. Everyone has either heard of or have experienced first-hand the struggles of homeschooling, and children without access to wifi or technology have had a super hard time, older people are lonely and unable to do family Zoom calls, and people with depression are suffering due to lack of access to social time and social care. The list goes on.

For those people with any issues in their access to technology, these times have been even harder than for others and this is something our society is having to address very quickly. The Government, for example, are currently looking at spending a cool £50 million on digital inclusion.

WHY IS THERE DIGITAL EXCLUSION AND WHAT CAN WE DO ABOUT IT?

The reasons fall within a fairly broad set of categories:

- Lack of digital skills
- Motivation
- Access (geographical, financial or physical)

LACK OF DIGITAL SKILLS

EXPOSURE

There are many reasons for lacking digital skills. Sometimes it is just simply a lack of interest and others do not have the exposure to digital devices and manage their lives offline. It is estimated that 20% of the UK population have very limited digital skills and this naturally will have an effect on their digital inclusion. 20% - that's a lot of folk.

AGE

Age is a contributing factor to digital exclusion of the estimated 8.37 million UK adults (16+) who have never used the internet, 6.91 million are over 55 according to Age UK, who also find that education is less of an indicator of digital literacy in the elderly than income, which is interesting and increasing age increases the likelihood of digital exclusion.

DISABILITY

The WHO estimates that around 15% of the world have some level of disability. Each and every region of the world has accessibility standards and for many years, those in digital arenas have been trying to ensure that design principles and standards are ensuring that the varying needs are being met. Easy to read, screen reader enabled, alt-text versions of media content and easy to navigate sites all contribute to ensuring sites are accessible.

MOTIVATION

"FACEBOOK'S FOR STALKING NOT TALKING".

Regardless of the marvel that is telecommunications, there are still many people that just don't like digital communications and prefer the real life face-to-face communication people enjoyed a lot more of before 2020. Outwardly, this would seem like a difficult group to address, that it would be hard to include these people in digital spheres, but that's not necessarily true. Adequate "opt-in" and consents for monitoring, allowing people to choose their privacy settings and which data is mined can help to persuade these people that they aren't giving away their privacy while engaging with websites and applications. Ultimately, it is imperative that organisations take an ethical and transparent approach to using customer data at a very minimum and ideally to allow a level of control that is often remiss - organisations have been slow to adopt this.

At a more basic human level, some people just feel really uncomfortable with certain technologies. Take video calls for example - there are many people that prefer to avoid them if possible. Again, having adequate policies can help with this. For example, a policy on teleconferencing behaviours can mitigate discomfort, the result of these types of policies means that people know that if they feel uncomfortable they have the option to leave the meeting, mute themselves if they feel like it, or turn the camera off. Simply communicating these options can really help people feel in control of their experiences and thereby less likely to want to avoid the calls and thereby increasing levels of interaction.

ACCESS

There are a myriad of reasons why access can be an issue. In the recent case of homeschooling due to Covid many issues were faced by many households; they had no computer or a shared computer and with multiple children or lack of wifi etc. In these cases money can help. Can digital inequality be solved by throwing money at it? In many cases, yes! The UK government has given 560,000 computers and laptops to children to support remote learning.

People in remote or rural areas are particularly vulnerable to poor internet connectivity issues and services. Whether users are in the Outback, or rural France the issues are the same. Aside from improving connectivity through government and private initiatives and drives, providing text only versions of websites can help those with poor connections and keeping content simple and easy to navigate can also help. Furthermore, all websites should be enabling content for the visually, cognitively, hearing or physically impaired using design principles that address these needs.

DIGITAL RESPONSIBILITY: BEING A GOOD DIGITAL CITIZEN

Whether in the digital realm or any other aspect of life everyone has a responsibility to behave themselves and cooperate with other people. Just as people check on elderly neighbours, or move off the pavement for people pushing pushchairs, organisations should really be making considerations to ensure their digital front is accessible to as many people as possible, and by making small changes which will just become commonplace activities, this can be achieved.

WHERE DO WE GO FROM HERE?

There is no one size fits all, no holistic approach that will solve this. It is a multifaceted problem that requires multifaceted options to meet the needs of the plethora of people we need to include.

In Frozen 2, Olaf says "advancing technology will be both our saviour and our doom".

Not so extreme but on the one hand advancing tech can lead to advancing exclusion but on the other it can help with inclusion and it doesn't follow that advancing technology necessarily means advancing the gap between the digitally included and digitally excluded.

For example, VR is really taking off in social care. Greenwood Campbell has first-hand experience of this; having created voice tech to assist the elderly for both Abbeyfield (#VoiceForLoneliness | Case Study | Greenwood Campbell) and for McCarthy and Stone. Many people find voice tech better for their needs and actually this technology (although more recent than text based technology) can be more inclusive for certain access groups.

Technology really is neither our saviour or our doom because technology is just a tool, and then fundamentally the use of the tool becomes about intent; how people and organisations use the tools available to them. It is a human responsibility to make sure that every access group is included in as much as possible when delivering a digital solution. Greenwood Campbell wants to make people's lives better through technology. We can, and so we will. That's our intent, and that's how it should be with every company. Now more than ever, we need to think about how we can include everyone in our digital society.

Technology is **best**

when it brings people **together**

- Matt Mullenweg, Social Media Entrepreneur

We increased digital inclusion in rural communities

Gemma Bianchi

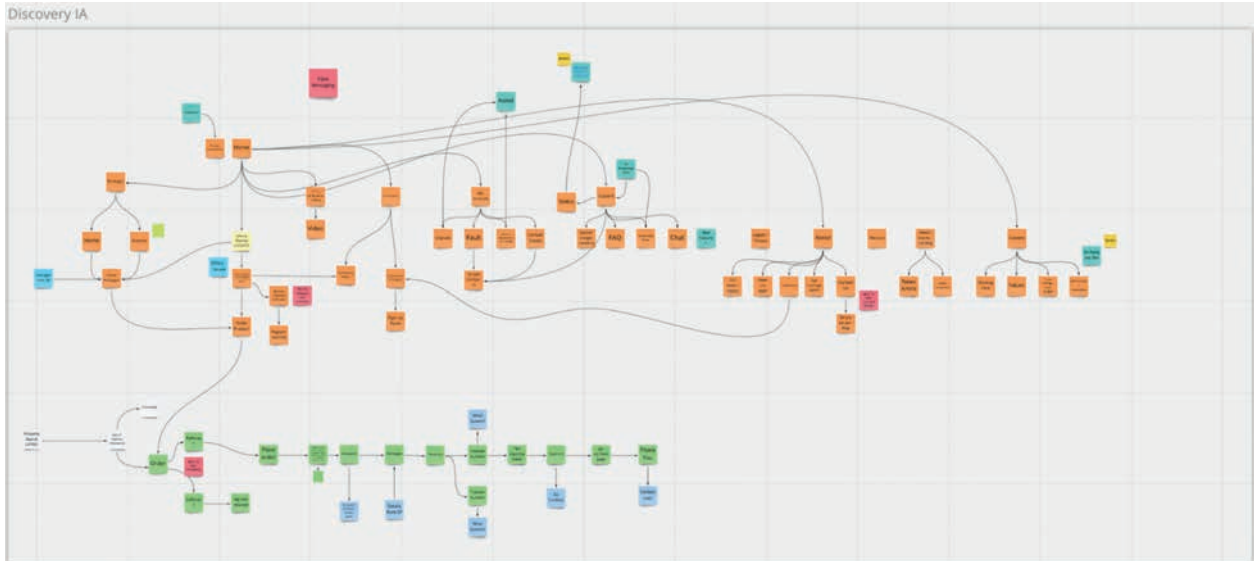
Wessex Internet is a forward-thinking, community-focused family business with a well established company infrastructure. They are passionate about upgrading the countryside. Their aim is to connect communities across Dorset, Wiltshire and South Somerset to fast, reliable broadband. By thinking outside the box and building full fibre networks, all supported by government investment, they are able to deliver superfast, affordable broadband to places other companies are unable, or unwilling, to go. Their mission is to make sure rural communities are not left behind forever.

CHALLENGE

After recognising that the existing website was no longer performing to its full potential, Wessex Internet had an exciting opportunity to rebrand and redesign the entire online offering. The ultimate challenge for Greenwood Campbell was to transform Wessex Internet's digital offering, position the brand as the leading business in the sector and ultimately help achieve their vision of 10x growth in 7-10 years.

WHAT WE DID

Working in partnership with the Managing Director, Marketing Director and Technical Lead at Wessex Internet, we started the project during the covid-19 pandemic by hosting a remote discovery session, using Zoom and Microsoft Miro.



The purpose of the discovery session was to understand and also uncover any challenges, become embedded within the company's mission and values, gather all strategic and technical requirements for the new website, discuss the target audience and finally understand what success looks like. From here, we started an extensive user research process.

On completion of our research which involved analysis of current trends, conversion data and user drop off, we started the design and development phase of the project. We created hi-fidelity wireframes with two distinct creative options for Wessex Internet to provide feedback on before designing the remainder of the website pages.

We chose to use Umbraco as the Content Management System for the website for three key reasons:

- Umbraco is an expert at providing mobile-platform specific sites with a single set of content meaning the site can be delivered to iPhone, Android and Windows phones seamlessly while Wessex Internet maintain only one set of content
- Umbraco is intuitive to use meaning Wessex Internet wouldn't need to rely on us to update content and make new pages.
- Umbraco can integrate seamlessly with Salesforce whilst also delivering eCommerce capabilities through GoCardless.

We broke each stage of the project into interactions and adopted a bespoke agile / waterfall methodology to delivery.

To ensure the user journey from initial interest in the services to purchasing Broadband was entirely frictionless, we created simplistic information architecture as well as built custom APIs for Salesforce.

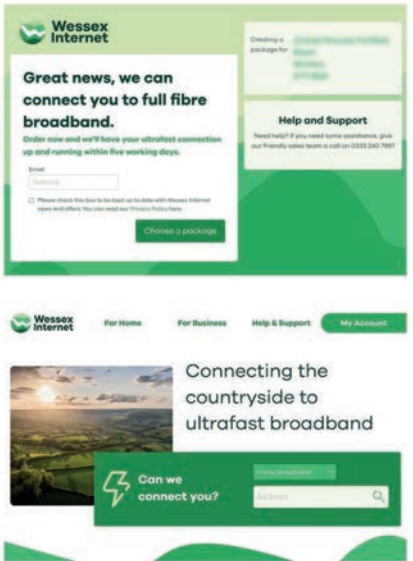
Finally we thoroughly tested the new website not just for browser functionality but user acceptance before launching in April 2021. Before handing over fully to the client, we delivered CMS training and created an in-depth, step-by-step Umbraco user guide.

RESULTS

Early feedback from the client has all been positive, with users commenting on the great new look and feel and easy navigation of the website.

Next up, Greenwood Campbell has been tasked with taking on a phase 2 sprint for the website. Here, we will take on any learnings from the phase 1 design and will see how this can be improved ready for the next update.

The customer account portal is also next on the agenda for a refresh. The "My Account" portal is for end users who have already set up an account and need to track payments and keep up to date with any changes to their local connection. We will look to update the design to be in line with the new site and improve the functionality overall.



The new reality is diminished

Gemma Bianchi

As a plethora of new altered reality technologies continue to evolve, it is critical that we draw distinctions between the various types and understand the potential impact they have on our lives, relationships and businesses. This article will focus primarily on Diminished Reality.

WHAT IS VIRTUAL REALITY (VR)

VR refers to a computer-generated simulation in which a person can interact within an artificial, three-dimensional environment on electronic device, such as special goggles with a screen or gloves fitted with sensors.

VR immerses you fully in a virtual environment, one that is either artificially generated or emulates real-world surroundings other than your own.

WHAT IS AUGMENTED REALITY (AR)

Though both can be experienced via smart glasses or head-mounted displays, AR and VR are fundamentally different, and should be treated as such. AR makes digital alterations or additions to your existing environment, but you generally remain oriented to your physical surroundings.

WHAT IS DIMINISHED REALITY (DR)

Diminished Reality, in the most general sense, is the direct opposite of Augmented Reality. In AR, the goal is to augment, or add to, the real world using virtual imagery, sounds, smells, haptics etc. DR is the process of removing, eliminating, or diminishing the amount of perceivable stimuli from the world.

"I do think that a significant portion of the population of developed countries, and eventually all countries, will have AR experiences every day, almost like eating three meals a day. It will become that much a part of you". Apple CEO, Tim Cook

DIMINISHING PEOPLE

Someone who captured this technology both brilliantly and terrifyingly is Charlie Brooker in his Black Mirror episode "White Christmas" in which Brooker uses DR to block people from reality. **WARNING - there are some spoilers coming up.**

The episode explores three stories told by Matt and Joe from a remote cabin on Christmas Day. The first follows a man attempting to seduce a woman at a Christmas party while receiving remote guidance; the second sees Matt at his job training "cookies", digital clones of people; and the third shows Joe obsessed over an ex-fiancée after the relationship abruptly ends.

As these stories are unfolding, Matthew and Joe both make reference to another new technology: blocking. In "White Christmas," wearable tech has advanced beyond the rudimentary stages of Google glass and become Z-eyes, irremovable implants that let you take pictures and record things and, if you must, "block" other people.

Source: White Christmas - Black Mirror

In the episode, blocking makes the person who is blocked and the person who has done the blocking look like grey, fuzzy outlines to one another. They can't hear each other or communicate, and the blocked party has no recourse.

The terminology suggests a lineage with blocking someone on Facebook or Twitter. We tend to understand blocking as essentially protective: It insulates people from unwanted attention and (often misogynistic) threats - though of course it also keeps ex-friends and other irritants out of your feed.

The next time you have a spare 70 minutes, give it a watch.

On the surface, the ability to block seems to positively give the user control of their lives. But social media are virtual spaces. The 'White Christmas' block plays out in real life. This has some harsh consequences.

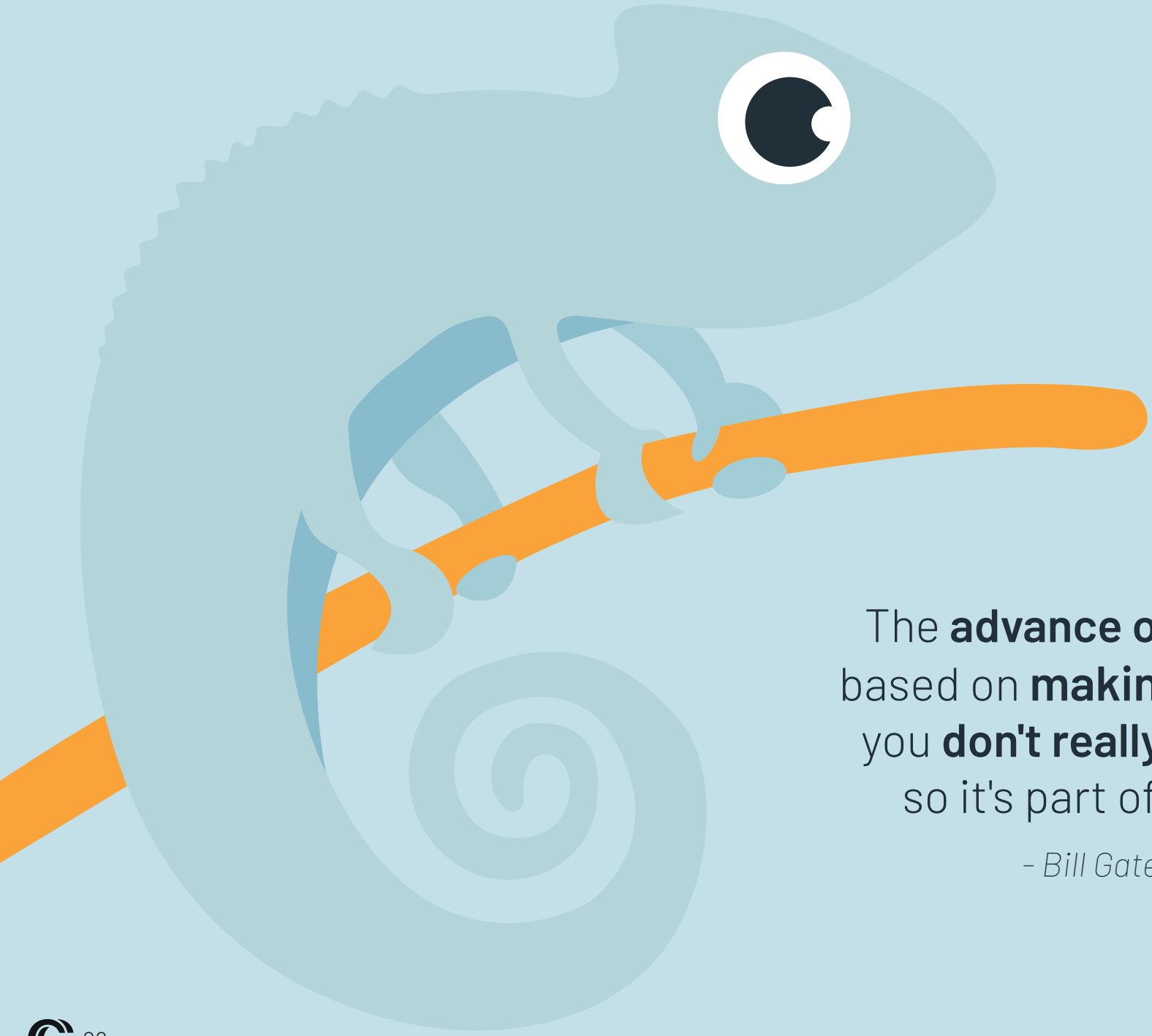
WHAT ARE THE OPPORTUNITIES

DR has existed in some form for over a decade, with one of the most ubiquitous examples being noise-canceling headphones. But as the technology matures and is developed for the audiovisual applications of smart eyewear, it will allow users to target specific stimuli to suppress, isolating a specific speaker's words and appearance in a crowded room, or removing all advertising from view during a walk through the city center. But there are also therapeutic applications for those with unique sensitivities, such as for those suffering from PTSD.

One study published by the Institute of Electrical and Electronics Engineers outlines a series of experimental workshops that used DR to assist individuals on the autism spectrum "who are adversely affected by continuously changing surroundings or distracting visual incidents."

"DR is the field of AR that focuses on virtually masking, reducing, or suppressing features of your environment. As smart glasses proliferate and AR becomes commonplace over the next decade, DR presents an opportunity to virtually shape our reality rather than simply build on top of it" - Future Today Institute Founder, Amy Webb

DR is well suited for image / video production where unwanted items / features of a scene need to be removed. In general, DR does not impose any constraint on real-time processing of a scene. For example, wire harnesses and assemblies are often used in action sequences where the actors must fall or hurtle a significant distance through the air. In the final edit of the movie these wires must not be visible to the audience.



The **advance of technology** is based on **making it fit in** so that you **don't really even notice it,** so it's part of everyday life.

- Bill Gates, Co-founder of Microsoft

Contractors and builders, especially, could benefit from DR technology. One could imagine a city planner designing a new hotel where a destitute parking garage currently resides. DR would allow the planner to remove the parking garage and place it in the new hotel design.

On a smaller scale, landscapers wanting to remove stumps or shrubs within an outdoor space, or bad tile and walkways could also utilise DR.

Indoors, interior designers could remove outdated or grimy décor before adding new accents and pieces through AR. With DR rather than leaving a black hole or blank spot in the place where a physical item once was, the technology is improving to the point where it can recognise the characteristics of the floor or walls around the object, and fill in the "empty" space accordingly.

Diminished reality gives us the power to change the way we see the real world.

Of course, almost all opportunities come with risks.

THEORETICAL EXAMPLE

Another Charlie Brooker reference coming up. This time with Black Mirror Episode "Arkangel", a story which imagines a world where parents can have a chip implanted into their child's brain which allows them to track the child, filter what the child sees and even view the world through their eyes.
(Spoiler warning, again...)

Source: Arkangel - Black Mirror

In the episode, daughter Sara has the microchip implanted and her mother Marie blocks out everything she considers scary or damaging, from a neighburs aggressive dog to blood and pornography as Sara gets older. As you'd expect, the over sheltering and interference has catastrophic effects.

Denying a human exposure to stressful or troubling images could leave them confused and desensitised to violence. Not only that, but constantly seeing what your child could see is an invasion of privacy that could also hinder their development.

ECHO CHAMBER

Greenwood Campbell CEO, Adam Greenwood said in his 2019 TEDx talk on the Echo Chamber, "How about if these same algorithms decide that you won't get on with certain people and so will block them from your view. Imagine that... you could be standing in a queue next to someone in a coffee shop and that person could be your future best friend, business partner or soulmate but based on your profiles and an algorithm's interpretation, you would never even meet.

Some people could argue that it's best that you only meet people that you are going to get along with, what's the sense in meeting people that you will argue with? The adage opposites attract is fine in jest but does it really work in real life? But if we don't spend time with people that challenge us, if we don't debate and discuss with people that share a different view, how can we be empathetic? How can we be inclusive of people with a different perspective? "

Watch the full talk

WHAT MIGHT THE FUTURE LOOK LIKE?

The truth is, no one really knows. However if we take a look back at other emerging technologies like the smartphone, app store and voice tech, it's safe to say that these new realities have a role to play in our future lives.

Each time a new technology is introduced, mass adoption is taking less and less time as people get used to using technology in their everyday lives. Especially if they enhance an experience or create convenience. One to watch.

Cancel Culture are you next?

Kirsten Dent

We all love to embrace the internet and the way it allows us to connect, explore and discover anything and everything we could possibly think of. But along with all the good the internet can do, there is a cost to being free. We can no longer be so naive in believing the internet is a separate world to the one we psychically live in. The things we share online can haunt us forever. Celebrities are finding themselves with life changing consequences for a post they shared as a teenager in the 2000's; sometimes losing their jobs and being outkast from their communities. This has been coined; 'being cancelled'.

Cancel culture refers to an individual or brand being called off or postponed indefinitely. A simple comment in an interview or a quick tweet may be something which people believe to be offensive and that brand or individual will then no longer be supported publically.

The power behind cancelling has been around for decades. The Dixie Chicks, a band from the late 80's, spoke out against a conservative republican president and in turn, had all their concerts cancelled and were dropped by their label.

After spending over 30 years building her brand to be one of America's most loved talk show hosts, Ellen DeGeneres found herself being cancelled in 2020. After claims Ellen had enabled a toxic work environment, she found herself having to apologise to the nation and promised to make changes inamentally. This didn't stop people voting with their T.V remotes though - 'Ellen' viewers dropped by 38% which is over 1 million people.

Cancel culture can be difficult to justify. Johnny Depp lost his role in the film 'The Fantastic beasts' due to allegations of abuse from Amber Heard. The Harry Potter brand didn't want the association of potentially hiring an abuser to damage their image. For the many that were seeking 'Justice for Johnny' this was completely uncalled for. Has Cancel Culture ruined Johnny Depp's reputation and career based on, what may just be, hearsay?

Millennials and Gen Z's are having more and more economic power, and with them comes their culturally conscious views. Gone are the days of just sitting back and taking inequality. In recent years we have seen action taking place in the #Metoo and Black Lives Matter movement and long gone are the days of supporting outdated brands with any association to inequality. Brands need to evolve or be left behind.

HOW CAN YOUR BRAND AVOID CANCEL CULTURE?

EVOLVE

The best way to avoid cancel culture is to keep up with the evolving times. Embrace all races, genders, ages and cultures from the people you employee, your marketing campaigns to the products you release.

OWNERSHIP

If you post or produce something people find offensive, acknowledge and apologise for it. DO YOUR CHECKS - Ensuring the HR, PR, Legal and marketing teams review brand statements before they are posted on social.

TRANSPARENCY

Be transparent with your customers - 46% of customers have said they found honesty and authenticity very important when choosing brands to buy from.

Cancel culture isn't a life or death situation for your brand. As the old saying goes, 'there's no such thing as bad PR', you can use the opportunity to show your values and get a little brand awareness from the situation. Consumers know it's people behind a brand, we're all human after all - mistakes are going to be made. Show empathy and take action, that's what consumers like to see. Gucci made the huge mistake of offending many by releasing a black wool jumper which resembled "black face" during black history month. They apologised and accepted responsibility for their mistake. Of course the item was pulled off the shelves but their CEO (Marco Bizzarri) also announced the brand was launching scholarship programs and internal training to "increase inclusivity, diversity, participation and cultural awareness." Gucci avoided being cancelled.

A solid idea?

James Shelley

In today's society consumer data is gold and in almost every interaction you do on the world wide web, your consumer data is being sent to multiple third parties. Even though in some of these cases, you do 'agree' to this by clicking a small checkbox on a form, what happens to your data after that? Even if you delete yourself from a platform or send over a data deletion request to a company, can you guarantee with absolute certainty that all of your data actually gets deleted?

Do we lose our inherent right to own our data and what is done with it because we have clicked 'I agree' on a privacy policy that none of us even read?

SOLID, a project by none other than the founder of the web himself, Tim Berners-Lee hopes to address this critical and fundamental flaw in the web we have found ourselves using today.

A simple two liner from the project themselves -

"Solid: Your data, your choice. Advancing Web standards to empower people."

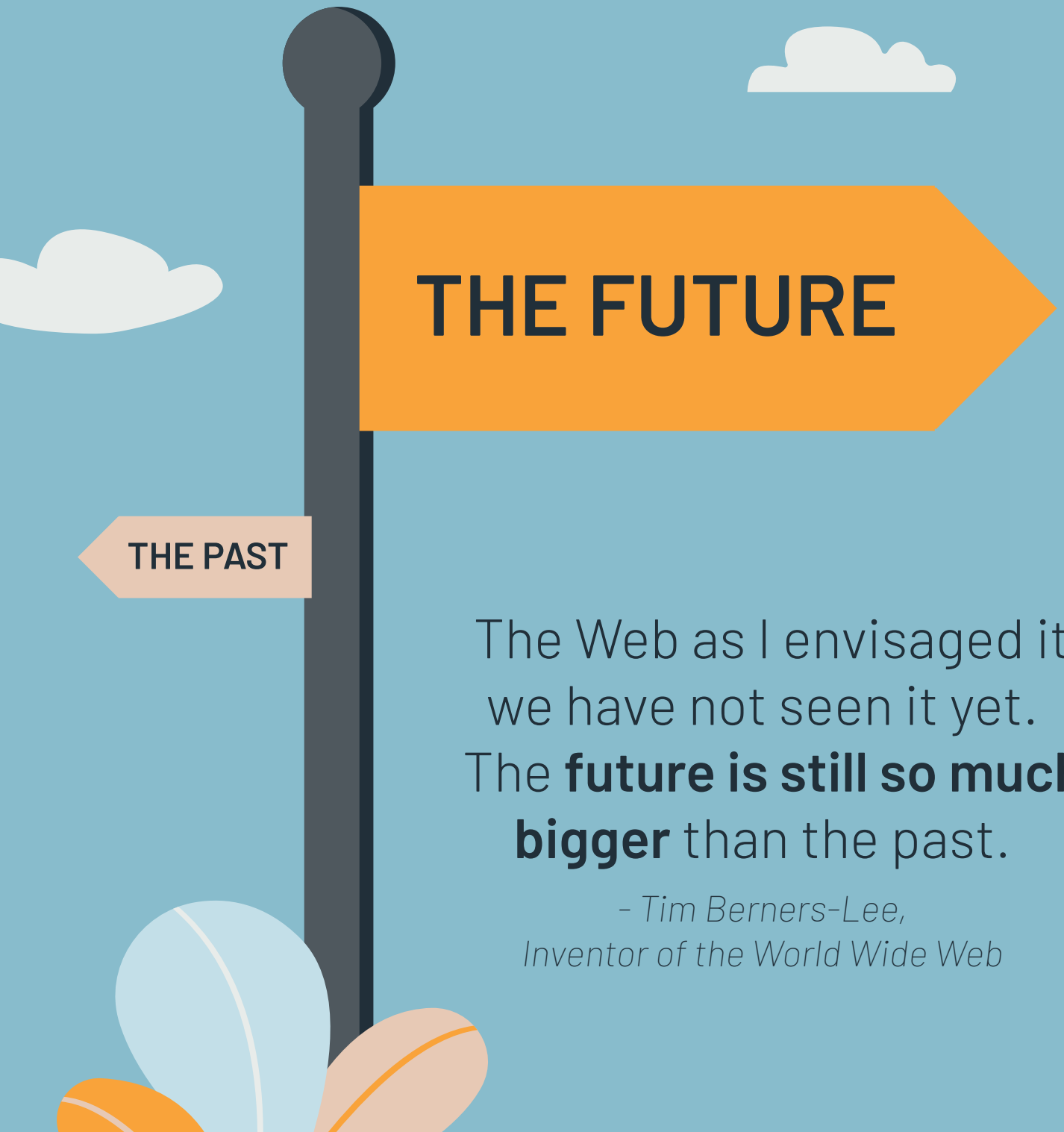
The fundamental issues that SOLID hopes to address are:

- You have hardly any visibility into what data is being retained
- You have little control over how your data is used, or who is using it
- You have little choice in which applications you can use to access your own data
- It is hard to use your data as a cohesive unit, specifically because it is siloed, scattered across proprietary vendors, interfaces, and data formats.

OKAY, SO WHAT ACTUALLY IS IT? AND HOW DOES IT PUT THIS CONTROL BACK INTO THE HANDS OF THE USER?

Solid introduces the concept of data pods ("a place for storing documents, with mechanisms for controlling who can access what"), and there are Solid applications that can read or write data from one or more data pods. You control everything that goes in and out of your own pod, and you can choose to share all of this data or only parts of it with other people, organisations and applications.

Most importantly, you yourself can revoke access to particular applications or organisations at any time. The key throughout this project is the complete separation of data from application!



The Web as I envisaged it, we have not seen it yet. The **future is still so much bigger** than the past.

- Tim Berners-Lee, Inventor of the World Wide Web

OKAY, SO WHERE ACTUALLY ARE THESE 'PODS' AND HOW DOES SOMEONE GO ABOUT GETTING ONE?

There are currently two options to get your own pod, either you can host a Solid Server yourself (which requires some technical knowledge)

or you can sign up via the Pod Provider network.

"A solid server can host at least one or more solid pods, accessible via the Solid Protocol." Each pod on that server is fully compartmentalised from any other pods hosted on that server, and the access rules to that pod are fully controlled by the pod's owner, i.e. you the user.

All data stored in your pod is linked to your unique identity, and you are never "locked in" to a specific pod provider, you always have the ability to move your data elsewhere. You could have a pod for your personal life and choose which friends can access it, you could have a pod for work and choose which enterprise companies can access it. You are in control.

Adoption of this new set of protocols will not be an easy feat, however after reading about just one too many huge data scandals over the past few years, it is something I think many people would like to see.

The rise of Digital Fashion

Kayley Doyle

"Don't buy less. Buy digital"

Let's imagine a world where your clothes are made of pixels rather than textiles. A world where in real life, you could maintain a minimalist, highly sustainable, more ethically friendly wardrobe. Whilst on social media, your digital persona could be far more expressive with hundreds of new clothing items. With the rise of new and fast emerging technologies in this space, digital fashion in the mainstream is becoming a real possibility and plenty of companies are betting on its prominence in the industry's near future.

On its surface, digital fashion may seem like a distant need. Yet, perfecting our online appearance is already a large part of our day to day life. From cultivating an Instagram aesthetic, or perfecting images shared through filters, we are thoughtful about our online impressions. Currently, these virtual fashion creations are limited to being either superimposed on still images, posted to social media, or created for avatars to wear within video games - but don't be fooled, they definitely aren't free.

A dutch brand, The Fabricant, is already leading the way for digital fashion companies, making a noise when one of its virtual dresses sold for an astounding $9,500 (really).

The Fabricant - Iridescence Digi-Couture Dress - Worlds first digital-only dress sold for $9500.

> I truly believe we are going to be the first billion dollar digital fashion company.
>
> The Fabricant founder Kelly Murphy

Gucci's virtual sneakers, to be 'worn' in AR worlds and on social media

COVID-19 HAS FAST-TRACKED THE GROWING NEED AND BENEFITS OF DIGITALISATION.

Digital fashion has fast transitioned from a simple 'nice to have', to a 'must have' in the arsenal of any company within the fashion industry.

Brands are now facing the challenge of remaining profitable and relevant with limited access to physical samples, large scale travel bans and what feels like a big shift in values surrounding unnecessary consumption. Kelly Murphy says - "digitalization is a critical move to ensure industry resilience, sustainability, and long-term relevance."

FROM FRINGE TO MAINSTREAM

Virtual luxury fashion is now looking to move from fringe to mainstream in 2021. Paving the way is Gucci, who has grown considerable investment in forward-thinking digital fashion partnerships, such as with the avatar platform, Genies, and an in-house app called Sneaker Garage, where users can use augmented reality to try on the brand's virtual footwear. Earlier this year, Gucci went on to produce a pair of virtual neon-green sneakers, for £9, to be "worn" in augmented-reality (AR) gaming worlds, as well as on social media.

Gucci isn't alone. Other big brands, such as Louis Vuitton, have used gaming as their stepping stone into the world of digital fashion. Louis Vutton have partnered with League of Legends - a huge online gaming franchise gathering over 100 million monthly users - to release their own range of skins (outfits worn by game characters) alongside a collection of 'League'-themed clothing and bags. More recently, Burberry announced in March 2021 it has exclusively designed two skins for the Holdings blockbuster game Honor of Kings, a hugely successful multiplayer game in China.

Check out Honor of King's co-creation with Burberry

"By allowing our Chinese customers to explore virtual products through the medium of online games, we can connect with our communities in a way that really resonates with them," said Josie Zhang, president of Burberry China.

For many consumers - designer brands such as Burberry, Gucci and Louis Vutton are far out of reach. Digital campaigns provide the rare opportunity to try out exclusive clothing without breaking the bank (with some in-game outfits costing over $6,300 in real life).

Due to the huge outreach - Honor of Kings became the world's first game to average over 100 million daily users last year - crossovers between luxury brands and games will continue to be a growing trend. In fact, consumer spending on gaming skins worldwise is predicted to hit $50 billion by 2022.

THE OPPORTUNITIES

The digital fashion concept isn't totally new within the gaming industry, with the in-game cosmetic industry projected to be valued at roughly $40bn; gamers have been spending a significant amount of money on virtual clothing for a while now. The market to replace the existing multi-brand eCommerce shopping experience with solely digital clothing however is new, and opportunities here are certainly worth noting.

A SUSTAINABLE SOLUTION TO FAST FASHION

The perception of 'style' has long been synonymous with new, interesting outfits, with one in six young people claiming they won't rewear an outfit if it has been seen online, and is one of the core drivers of fast fashion. Digitalisation herein may be the solution, providing the platform to satisfy consumerism without the inevitable physical waste. Dress-X, a digital fashion retailer, claims that the carbon footprint of producing one digital item is "95% less than an average garment."

"With the fashion industry consistently under fire for its pollutive practices, and with more and more of the developed world's populations customising avatars in virtual realms, the market for digital fashion has a promising future." - Amy Webb, The Future Today Institute.

MANUFACTURING COSTS

At the forefront, companies have an opportunity to greatly reduce manufacturing costs. PUMA's recent campaign, "Day Zero", in partnership with The Fabricant, reduced water usage by up to 17.4% and their time to market and costs by 30% by simply utilising a digital, rather than physical, proof of concept in the design phase. Only once perfected digitally did it move on to production.

ONE SIZE FITS ALL

Brands have a real opportunity here to become truly universal. The majority of existing digital fashion brands already aim to provide genderless, and sizeless pieces. This means inclusivity can be rife, leading to greater user satisfaction overall and an increase in brand outreach.

CREATIVITY AND TRUE SELF EXPRESSION

London based designers, Auroboro's, say that digital fashion "is an entirely new form of expression. So far the 21st century has pretty much been a repetition of everything done in the 20th century. But now we have the capacity to wear fire or water on an everyday basis."

With designers no longer limited by the physical world, users can find pieces that truly reflect a more abstract version of how they want to be seen. Kelly Murphy, Fabricant founder, argues, "the digital-only fashion sector returns to the heart of what fashion was always meant to be – a playful and creative space that allows us to fully express our identities and individuality."

WHAT MIGHT THE FUTURE LOOK LIKE?

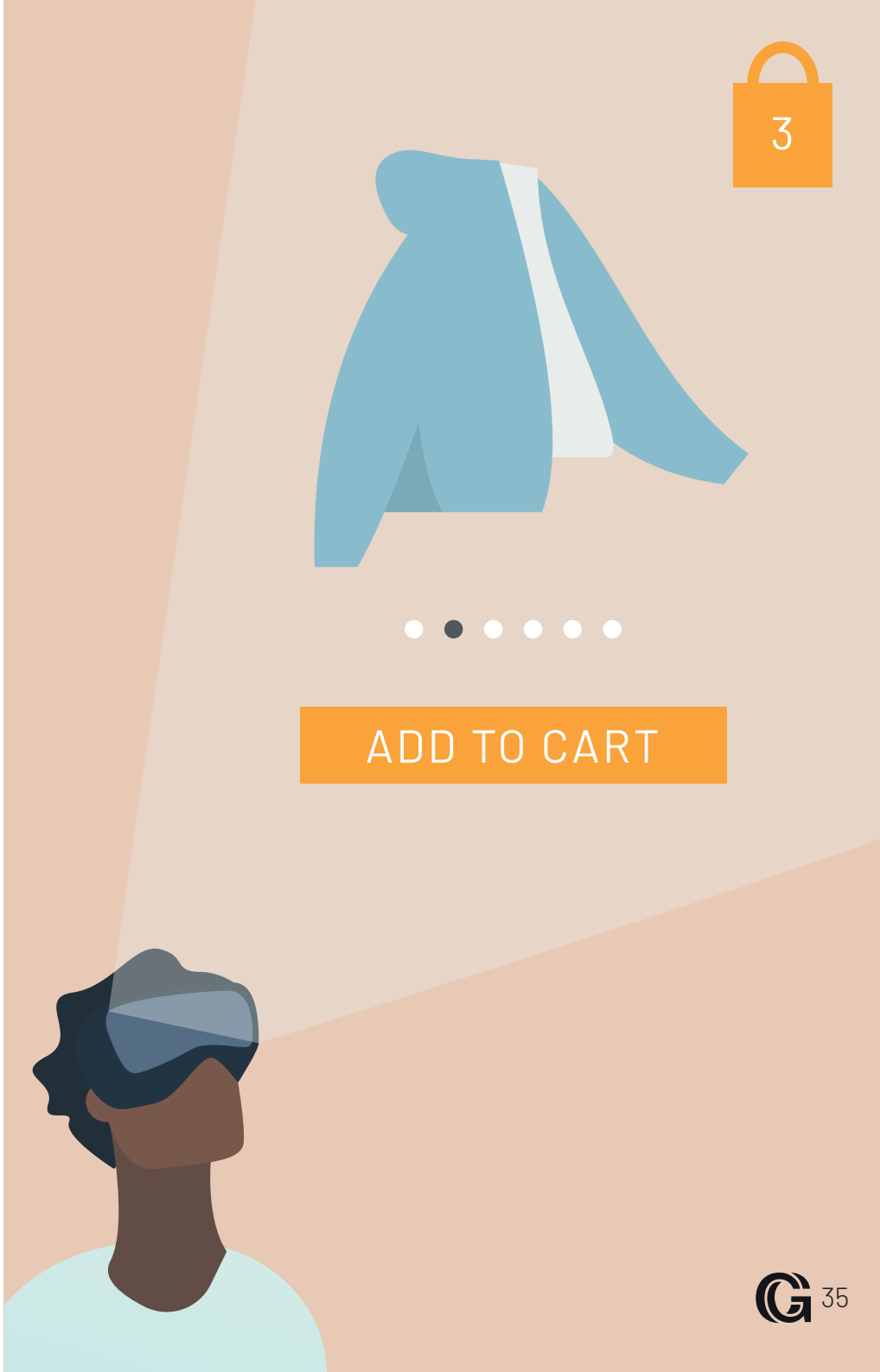
The real question is; is digital fashion truly set to boom in the 21st century, or pass as another fad? While impossible to answer in the present, the digital fashion market is definitely set for growth. Giving its ability to reduce waste while also providing retailers with additional revenue streams, and also its versatility to adapt to any online space or community, digital fashion is not something to ignore. Buying a new coat in a store may now come accompanied with a QR code for a digital counterpart, allowing users to build their digital wardrobe alongside their physical one.

In time, as AR eyewear becomes commonplace, users may even be able to virtually showcase their digital looks on their person instead of just an avatar - Amy Webb from The Future Today Institute suggests that as AR (alternate reality) eyewear becomes more and more popular within society, your digital wardrobe may become less 'digital' - *"imagine a future in which you select a simple sustainable garment or "canvas" from your physical closet, but select a virtual outfit to project on top of it, one that is visible to anyone wearing smart glasses".*

Digital fashion may be a worrying signal to some that today's society is continually more concerned with their online persona than it should be, but it is worth focusing on the benefits for now. Digital fashion is pioneering a solution that can provide a social experience, while also answering the need for sustainability within the fashion industry. While we still have a long way to go, adoption of digital fashion from the likes of Boohoo, ASOS or Missguided may pave the way for a true paradigm shift in how we view, and most importantly produce clothing.

For now, the message from Dress-X co-founder Shapovalova is clear:

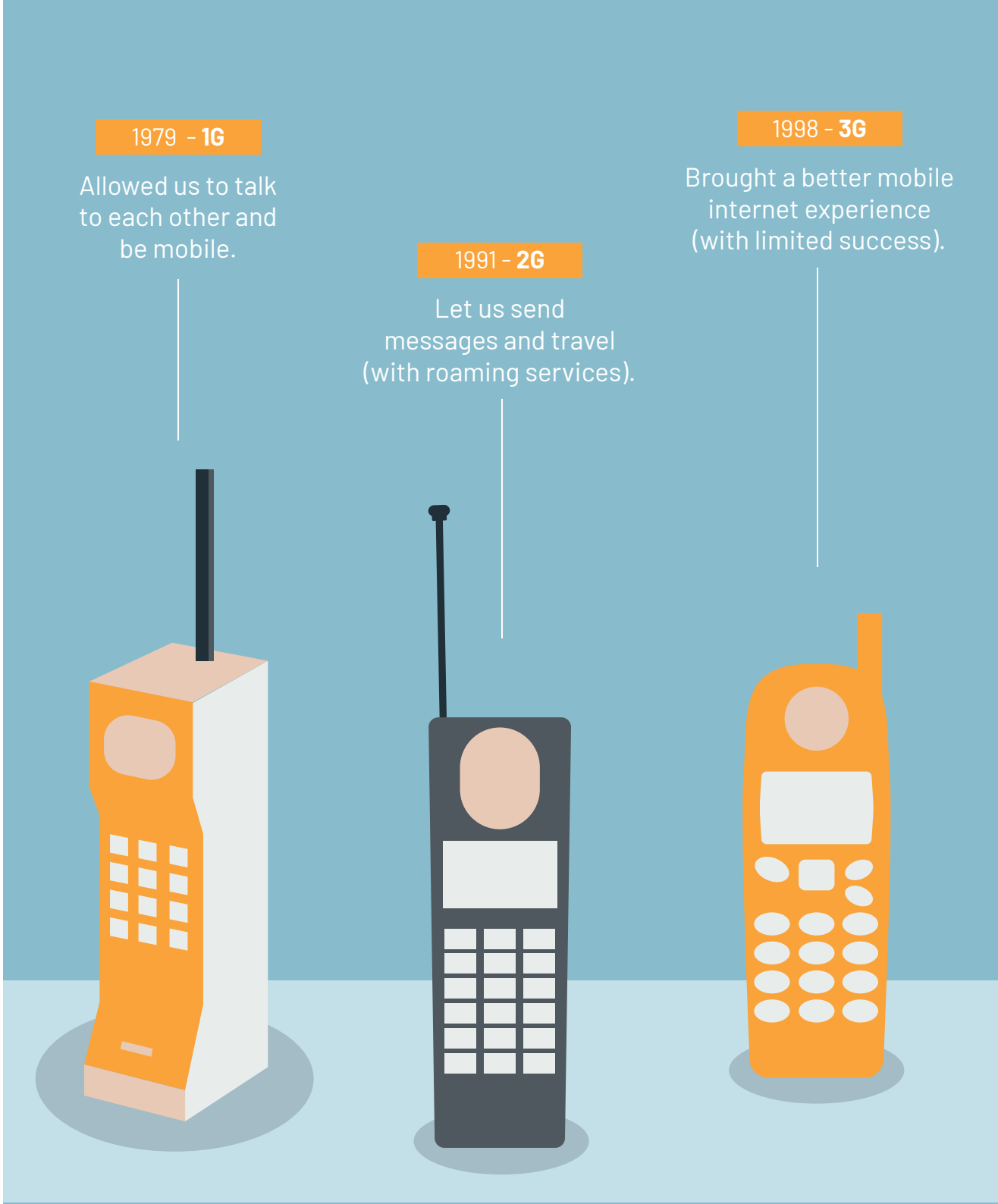
"Digital fashion is the new fast fashion. If we really want it fast, it should be digital."



5G, 6G and beyond...

Beca Hughes

The lead up to the 5G launch has been a long time coming. In the past 8 years, telecommunication companies worldwide have been planning, building and installing infrastructure to expand their services to the next generation of wireless technology.
5G technology launched in just 2019 and we are already looking towards the next steps; 6G.
But how prepared are we for these changes?



2008 - **4G**

Networks brought all-IP services (voice and data), a fast broadband internet experience, with unified networks architectures and protocols.

2019 - **5G**

Networks expand broadband wireless services beyond mobile internet to IoT and critical communications segments.

5G - THE FACTS AND THE MYTHS

THE FACTS

- 5G aims to deliver data rates that are 10 to 100 times faster than current 4G networks. (Live Science)

- The technology is expected to unleash a massive 5G IoT (Internet of Things) ecosystem (Thales)

- 5G will reach 3.5 billion subscriptions by 2026, making it the fastest generation ever to be rolled out on a global scale. (Ericsson)

THE MYTHS

- 5G is responsible for COVID-19 spreading.

- 5G uses lots of energy and negatively affects the climate.

- Standing in the beam of a 5G antenna can cause health issues. Children are particularly affected because their thin skulls allow radiation to penetrate deeper than in adults.

DRAMA OR CRISIS?

If you've seen the news lately, you may be wondering why so many people worldwide are against 5G. From groups of people tearing down masts to people thinking Bill Gates is using the COVID vaccine and 5G network to implant microchips into humans. One thing that it's important to realise is that there isn't one single "5G conspiracy theory".

Many people started seeing a link between 5G and coronavirus claims in the second half of January 2020, shortly after the virus started getting significant UK media coverage, but before Covid had formally been declared a pandemic. As the country went into lockdown, telecoms engineers were put forward by the government as 'key workers', allowing them to work and continue building 5G infrastructure through the pandemic. Because of this, people worldwide started creating new rumours connecting 5G and Coronavirus.

One main theory put forward was that Covid-19 symptoms were actually "mass injury" from 5G, against medical fact, claiming you cannot 'catch a virus'. Another was that the disease had broken out in Wuhan because of 5G there, re-emerged with claims that Covid-19 hotspots were also covered by 5G, and that cases on cruise ships could be explained by the radiation emitting technology used on them. It's safe to say that in the beginning, a lot of the rumours started off small and grew dramatically within weeks, fueled by lack of facts or knowledge and fear; headlining top news stories and endorsed by celebrities such as Wiz Khalifa (36.2 Million followers), Keri Hilson (4.2 Million followers) and Amanda Holden (1.9 Million followers).

Since then, the U.K. government has put out official responses in line with Public Health England advice stating that the International Commission on Non-Ionizing Radiation Protection guidelines were being adopted and that there wasn't evidence that exposure above these guidelines was harmful. From this, we can learn that businesses need to effectively reassure people if they introduce any causes for concern, which is much easier to do when the concern is less widespread. Providing clear, high-quality and reliable information from the beginning for those who may have concerns is a key role in this day and age where people may be confused and scared.

NEXT STEPS...

There is some debate about what 6G will entail, and whether it's relevant to consider the term, as user requirements will change greatly in the next 10–20 years. We know 6G will include increased demands for machine-to-machine communications, including robotic and autonomous drone delivery and transport systems.

- Other demands predicted for 6G include:
- Ultra-dense phone networks - allowing more users to connect effectively and efficiently.
- Reconfigurable hardware - to provide higher performance and flexibility to adapt to changing system needs at lower cost.
- Millimetre waves for user access - allows for an increase in the number of access points (APs) to cover a large area but also means fewer client devices will share the bandwidth in each cell.
- Enhanced optical-wireless interface - to allow for the same transmission resource to be reused many more times when compared to large area cells.
- Networked VLC - creates numerous channels available without interfering with other sources, supports larger bandwidth, less energy consumption and provides secured communication systems.
- Intelligent networking and technologies to enable full immersive experience for users - for the ability to offer new and advanced facilities, all staff within an organisation can have access to equal services, irrespective of the branch in which they are located and it enables operational services to be more easily sub-contracted.

All in all, it's difficult to know exactly what 6G will look like right now due to the ever evolving world of technology we are in, but Dr. Mahyar Shirvanimoghaddam from the University of Sydney, claims 6G could deliver mind-boggling speeds of 1TB per second, or 8,000 gigabits per second (imagine, in one second you could download 142 hours worth of Netflix movies).

But, if in the 8 years leading up to 5G, we couldn't prepare for the outcomes which arose; what's to say 6G won't be worse?

Does Digital Privacy exist?

Gemma Bianchi

Digital advances are evolving quicker than we can create policies to protect consumers, leaving us exposed and potentially vulnerable. But they can also be useful aids in catching criminals, keeping us safe, making our lives easier and early detection of disease.

Let's take a look at the most common and most controversial types.

FACIAL RECOGNITION CAMERAS

Facial recognition is a way of recognising a human face through technology. A facial recognition system uses biometrics to map facial features from a photograph or video. It compares the information with a database of known faces to find a match.

Face recognition systems use computer algorithms to pick out specific, distinctive details about a person's face. These details, such as distance between the eyes or shape of the chin, are then converted into a mathematical representation and compared to data on other faces collected in a face recognition database.

Law-enforcement agencies such as the Metropolitan Police, typically use face-recognition cameras to identify criminals or terror-suspects in public spaces, at entry points such as airports, border crossings, road checkposts etc, and during search-and-capture missions.

Facial recognition software has the obvious benefit of removing wanted criminals from the street, but on the other side of the coin, it also takes 'faceprints' of millions of innocent people - often without you knowing about it. That's biometric data as sensitive as a fingerprint.

EYE MOVEMENT TRACKING

Technologies to measure gaze direction and pupil reactivity have become efficient, cheap, and compact and are finding increasing use in many fields, including gaming, healthcare, driver safety, military, and online marketing - i.e. your website.

Creating a successful website takes more than just creating a visually appealing design. The most effective websites create a satisfying user experience based on how consumers' track and read information on a page. Eye tracking is the process of measuring and analysing patterns of visual attention of your prospects when they land on your site.

A large body of work across different research fields has demonstrated the rich information content available in human eye movements. Pupil size is related to a person's interest in a scene and can be used to measure cognitive load. Other works have shown that eye movements are closely linked to mental disorders, such as Alzheimer's, Parkinson's, or schizophrenia. More recent work in HCI has demonstrated the use of eye movement analysis for human activity recognition as well as to infer a user's cognitive state or personality traits. More closely related to our work, several researchers have shown that gender and age can be inferred from eye movements, e.g. by analysing the spatial distribution of gaze on images like faces.

All of these works underline the significant potential of eye movement analysis for a range of future applications, some of which may soon become a reality, for example, with the advent of eye tracking-equipped virtual and augmented reality head-mounted displays. Despite the benefits of these future applications, the wide availability of eye tracking will also pose significant privacy risks that remain under-explored in the eye tracking community.

Eye movement biometrics have also emerged as a promising approach to user authentication making logging into applications a lot more straightforward and harder to 'hack' with guessed passwords or vulnerable software.

Although this technology is great for user experience, there are a number of other extraordinary uses including:

- Early Diseases Detection
- Natural VR Interaction
- Stress Level Monitoring

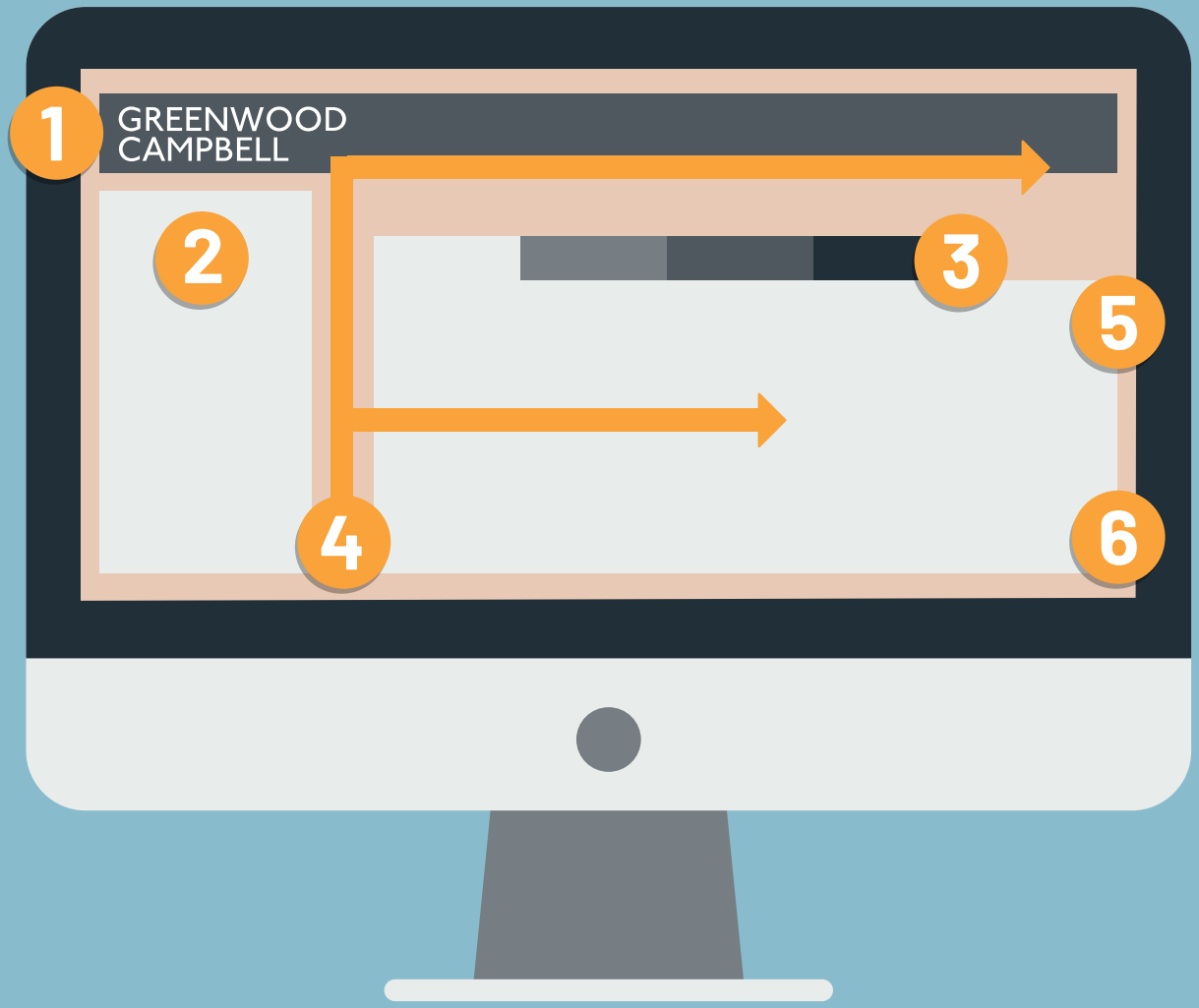
But eye tracking doesn't come without a dose of scepticism. I recently (April 2021) asked my 25,000+ LinkedIn network their view on eye tracking software and the majority were not keen. Admittedly this was not for health benefit but more convenience.

Would you have privacy concerns over a website that wanted to track your eye movements in return for a more personalised service?

Yes, I would have concerns	72%
No, I'm fine with that	28%

Design tips
to consider

1. Place logo at the top left of the site and do not distract from that image
2. Place important content on the left side of the page
3. Navigation bars should be across the top or on the left side, preferably across the top
4. Consider F and E eye movement patterns when writing content and image layout
5. First two paragraphs on every page should state the most important information
6. Do not include a lot of text as users wont read it completely



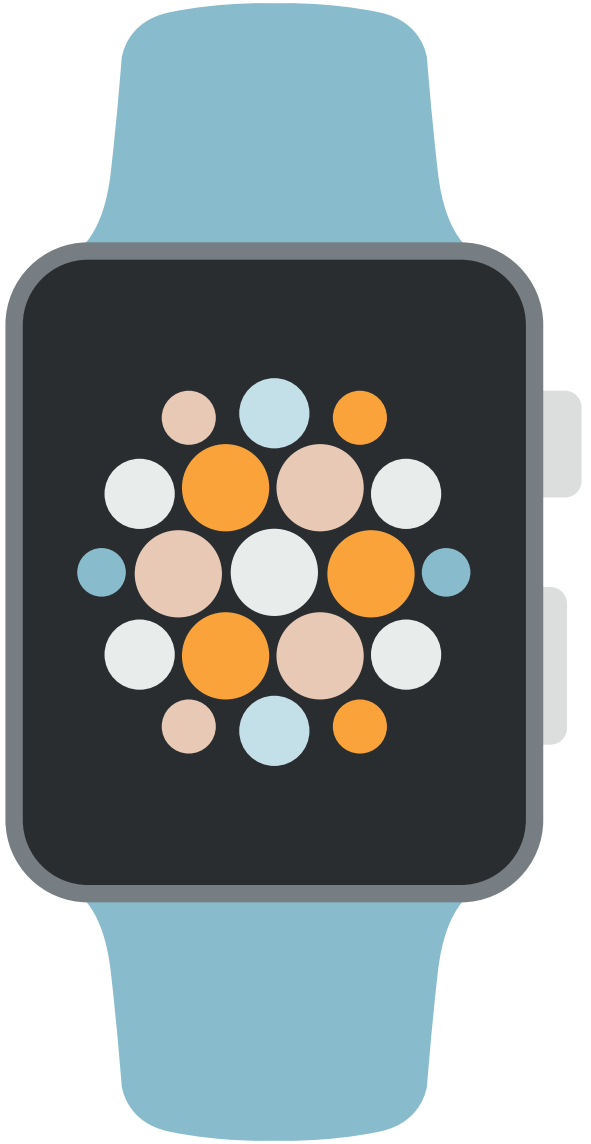
HEALTH DATA

The Apple Watch launched in 2015 and has since sold over 100 million units. The device uses your health data such as height, weight and heartbeat to track trends such as your cardio fitness level, daily calories burned, your walking pace and how many times you stand in a day. You can give yourself daily targets and compete with other people.

Apple calls it "the future of health on your wrist" and I tend to agree...

In 2018, a woman sent a letter to Apple, thanking them for saving her life. In the letter, she detailed how a few weeks after having a baby she had received an alert from her Apple Watch indicating that her heart rate was abnormally high. Concerned, she visited the hospital, where she was diagnosed with thyroid storm, a condition that elevates heart rate and body temperature to dangerous levels and, if left untreated, can be fatal. Thanks to her Apple Watch, this woman is alive & healthy.

Another Apple customer, Scott Killian, who was given a clean bill of health a few months previously, was woken up at 1 am by his Apple Watch alerting him that his heart rate was very high. During his subsequent visit to the emergency services, Scott was told the news that he had suffered a heart attack and had four blocked arteries. He would likely have died if he hadn't had the alert.



Over the last 18 months, we've been hearing rumours of new features in wearable technology such as oxygenation levels, stress levels and blood pressure.

University of Michigan researchers have recently created a wearable device that can continuously collect and examine circulating tumour cells (CTCs) in the blood. These cancer cells are typically obtained via blood samples to provide a biomarker for treatment, but this wrist-worn prototype could potentially screen patients' blood for a few hours to obtain only the CTCs of interest.

WHAT IMPACT WILL THIS HAVE?

The ability to constantly monitor someone's health can dramatically help in early detection of infection and diseases and potentially help save millions of lives.

"Capturing these signs while sitting on a hospital bed is different from capturing them while we're going about our daily life.

The continuous, mobile monitoring can be much more insightful. This is potentially a new type of medicine" - Gadi Amit, founder of NewDealDesign, which created the Fitbit.

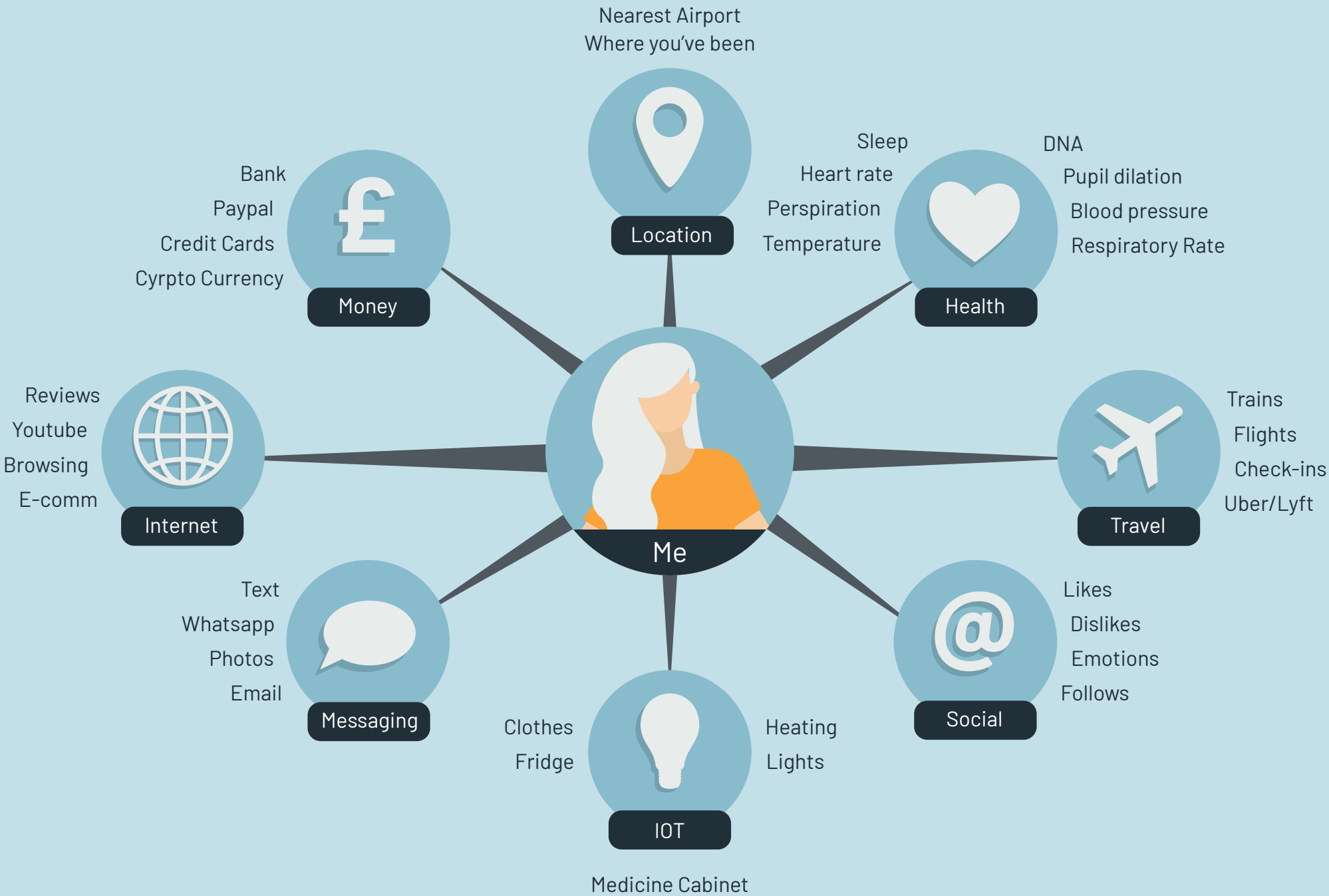
WHAT HAPPENS WHEN IT GOES WRONG?

I recently listened to 'The Dropout' podcast on the story of Elizabeth Holmes and her company Theranos. Holmes claimed to have revolutionized blood testing for disease using methods that could take only incredibly small volumes of blood. She also claimed these tests could be performed very rapidly using small, automated devices that the company had developed. This wasn't the case. There are 100s of examples online from patients that received an incorrect diagnosis from Theranos blood samples including one woman who was told her cancer had returned. A devastating message to hear. Thankfully, further tests by her doctor confirmed it hadn't and the Theranos test was wrong.

HOW FAR WILL IT GO?

Back in 2017, a small team at the agency came up with the concept 'IAMU'. IAMU is a Virtual Personal Assistant that links together with your health data, finances, social circles - you name it.

With the ubiquity of data and our propensity to share it, a new type of AI can create a complete picture of us, that knows us better than we know ourselves. It can predict our buying habits, what we should eat, the optimum level of exercise to remain healthy, our friends that make us feel good, how we can save time on travel and the best possible time to think about starting a family. Check her out in action.


Nearest Airport
Where you've been
Location
Bank
Paypal
Credit Cards
Cyrpto Currency
Money
Sleep
Heart rate
Perspiration
Temperature
DNA
Pupil dilation
Blood pressure
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Health
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Me
Trains
Flights
Check-ins
Uber/Lyft
Travel
Text
Whatsapp
Photos
Email
Messaging
Likes
Dislikes
Emotions
Follows
Social
Clothes
Fridge
Heating
Lights
IOT
Medicine Cabinet

Digital Twins – how, what, why?

Tris Tolliday

In essence, a Digital Twin is a simulated clone of a physical object, or objects. This could be at the atomic scale, all the way up to cities, countries and more.

Every single one of us uses a digital twin daily. Whenever we check the weather, we are looking at a prediction of sun or rain, based on an accurate twin of the world's weather systems.

Use cases will dictate the importance of certain elements of a digital twin, for example a propeller needs to match the aerodynamic qualities of its real counterpart, whereas a warehouse robot is more concerned with traction and not knocking over shelving.

Almost every industry can benefit from the use of digital twins, for predicting issues, rapid prototyping and simulating crises.

HOW DIGITAL TWINS WORK

In order to accurately simulate the physical object Digital Twins usually rely on sensors and IoT devices (Internet of Things), which provide data, such as temperature, pressure, accelerometer direction, and gas levels. Not dissimilarly to those found on your smartphone, or appliances at home. This creates feedback which helps ML (Machine Learning) models predict parts that are going to wear down, potential bottlenecks in production, or lifesaving information that could otherwise not have been gleaned.

This data is then usually streamed to the cloud, where it is stored and queried at an enormous scale, feeding simulators and machine learning models.

Physical and digital twins are often used in tandem, such as NASA using physical replicas of the Mars Rover to troubleshoot.

REAL WORLD EXAMPLES

Digital Twin's have the potential to massively impact nearly every vertical, frequently being implemented with IoT and AI.

CONSTRUCTION

Singapore has produced a 3D twin of the entire city allowing new buildings to be modelled and tested in near real world conditions. The concept also allows for virtual experiments, with analysable results, and even having nearby construction projects collaborate and effectively plan their projects in combination.

In the future, the city is looking to release portions of the data to local businesses, to feed information for further use such as navigation for driverless cars or ideal placement of solar panels within the city based on sun position.

MEDICAL

The Living Heart Project is able to scan the human heart, and create a Digital Twin, then use XR to investigate within the veins and arteries. This is a huge boon for surgeons, able to simulate a surgery multiple times over for the best outcome, before even making their first incision.

INFRASTRUCTURE

Our hometown of Bournemouth has already shown the implications of Digital Twinning during the first stages of the UK 5G trials. As 5G is more easily interrupted by smaller objects, such as leaves and lamp posts, than it's 4G counterpart, the data was used to identify the best locations to place masts.

To see the quality of the data, just look at Bournemouth on Google Earth.

ENERGY

General Electric have created the revolutionary concept of 'Digital Windfarms', allowing for constant optimisation of sails and motors in real time, as their promotion filled video shows. Given the scale of the energy industry, and with the climate emergency ever increasing pressure to reduce emissions while industries continue to grow, twinning could be one of the key weapons in the fight against climate change.

TRANSPORT & AVIATION

Aircraft Maintenance is possibly the largest issue facing the aviation industry today. General Electric, Boeing, SpaceX and others have already looked to Digital Twin Technology to improve reliability of parts by analysing wear using a hybrid of IoT sensors onboard to feedback to Twins, and simulation of lifetime wear during first build to increase reliability, seeing up to a 40% improvement in part quality, and therefore airplane reliability.

The motor industry is already buzzing about the future of self-driving, electric cars, and as we have seen above with Singapore, the data provided can already assist with making self-driving a solid future technology. Combine digital cities with the improved reliability found in the Aviation and Aerospace industries, and you can see how Digital Twin Tech can improve the lives of car and van drivers everywhere.

Digital Twins have the potential to impact every vertical. Providing insights that could otherwise be tricky, or impossible, to discover. Combine this with other emerging techs: IoT, 5G, AI, ML, and exponential increases in productivity, sustainability and quality are possible.

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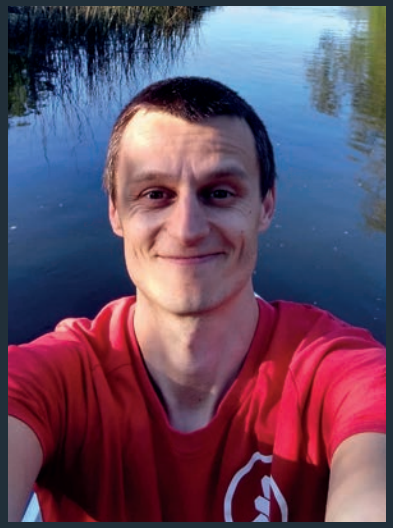

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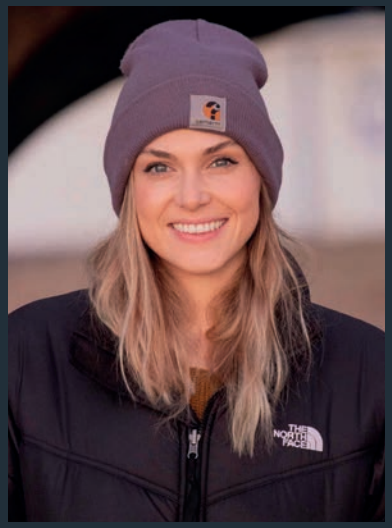

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