Real Estate Rebound

A tech-accelerated recovery

2021

COVID-19

More than **4,000** industry professionals, office occupiers, renters, retailers and life sciences professionals say that COVID-19 has accelerated tech adoption within real estate by an average of **4 years**.

Smart tech

The real estate professionals we polled recognised the value of smart technology, with **91%** saying it delivers higher satisfaction from tenants and **89%** saying it allows easier management of their buildings.

Smart tech sustainability

8 in 10

of those we polled agreed that smart technology makes buildings more sustainable.

Net zero emissions

47% of all those polled said they find living in a building that has net zero emissions very important, with this number highest **(68%)** in UAE and lowest in the UK **(33%)**.

Life sciences

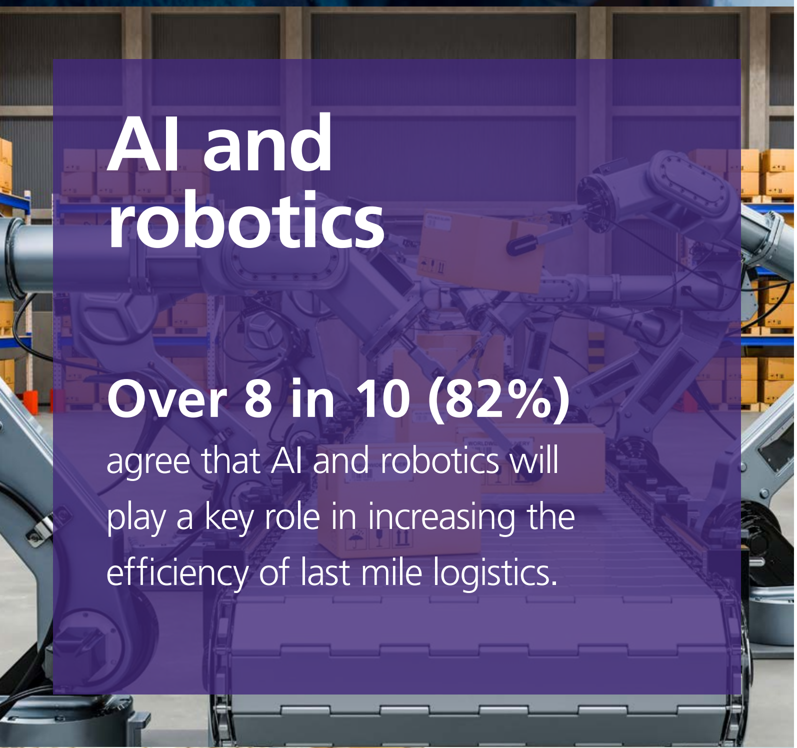
88% of life sciences professionals agree that AI and machine learning provide new avenues of growth for their businesses, with **90%** saying they make their work more efficient.

Appealing assets

82% of real estate professionals rank healthcare and life sciences as appealing assets, third only behind logistics **(85%)** and retirement living **(83%)**.

Renters

Renters and potential renters are willing to pay **20%** more on average in rent to live in a building with smart technology provided by the landlord.



AI and robotics

Over 8 in 10 (82%) agree that AI and robotics will play a key role in increasing the efficiency of last mile logistics.

UK property market

Almost **two-thirds** of industry leaders now describe themselves as optimistic about the UK property market.

Contents

Optimism returns as tech accelerates change

After the seismic shifts and re-evaluations faced by us all in real estate over the last 18 months, our latest annual research makes it clear that, for both the sector and its clients, vaccine-led confidence and optimism are supported by two additional forces shaping our future: technology and ESG.

We now know that the pandemic is expected to accelerate real estate's adoption of technology by four years according to the 4,000+ real estate professionals, office occupiers, retail specialists, renters and life sciences leaders we surveyed this year. We also know that, for the sector's clients, a drive towards digitalisation and increased innovation will be essential if real estate is to meet the sustainability demands not only of its immediate occupiers but also of investors, governments and society.

How far has the real estate sector actually progressed when it comes to all things Artificial Intelligence, Big Data and the Internet of Things? How far has COVID-19 advanced the need for fully integrated technology that not only increases wellbeing and efficiency but also supports the ESG imperative? Our Real Estate Rebound report explores this topic in detail, and is a barometer for the industry and its market outlook after an extraordinary period of lockdown and the ongoing challenges of the pandemic.

Our research focuses on six key jurisdictions: England & Wales, France, Germany, The Netherlands, Singapore and UAE. We polled occupiers related to the four key asset classes of offices, logistics, PRS and life sciences, to gauge their perspectives on how their markets have engaged with digitalisation and where it has really made an impact. We will be releasing additional insight on each of these markets over the coming weeks.

Another key element of our research has been in-depth interviews with leading investors and developers active across the asset classes mentioned above to understand their wide-ranging views on how technology is impacting these key areas of real estate.

We hope you enjoy reading our report. If you would like to discuss any of its themes in more detail, we would welcome a conversation.

Ciaran Carvalho

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Real estate bounces back

Recovery of the real estate market is well under way, with optimism rising and a vaccine-prompted bounce propelled further by two powerful forces driving the sector's future: technology and ESG.

Our poll of more than 200 real estate sector leaders controlling assets worth over GBP 500bn, reveals 64% are either optimistic or very optimistic about the market outlook, with 71% expecting a bounce back to pre-pandemic levels by 2023 at the latest.

In the midst of the UK's winter lockdown, during a bleak February, top real estate adviser Knight Frank took the business world by surprise by stating that there was GBP 43bn of global investment firepower available to buy London office property.

Another world-class firm, CBRE, also estimated up to GBP 45bn is still ready to be poured into the London market, and office transactions completed in the first half of 2021 were at or near pre-pandemic levels.

Share prices of London office-focused REITs and developers – such as Landsec, British Land, Derwent London, Great Portland Estates and Helical – were at, or near, 52-week highs as summer 2021 began, even as millions of people continued to work from home.

What explains this counter-intuitive positivity in the real estate market? The answer – vaccination, with real estate shares rising by more than 10% in a day when the Pfizer vaccine's successful trial results were announced. But the rebound is also being propelled by the impact of tech and the appeal of the best sustainable developments.

The picture is the same across continental Europe, with real estate broadly maintaining its appeal: Aberdeen Standard reported that EUR 247bn of deals were completed in the first quarter of 2021, and EY's `European Attractiveness Survey' was also upbeat.

Real estate divides

COVID-19 has already created a stark bifurcation in the real estate world between assets that are enabled by technology to make the return to the workplace seamless and as attractive as working from home, and older properties that cannot be adapted to the new digital age.

The best of these assets also achieve world-class sustainability ratings, appealing not only to a generation of occupiers, who due to the pandemic have become more environmentally and socially conscious, but also to institutional investors for whom the ESG agenda has rocketed in importance.

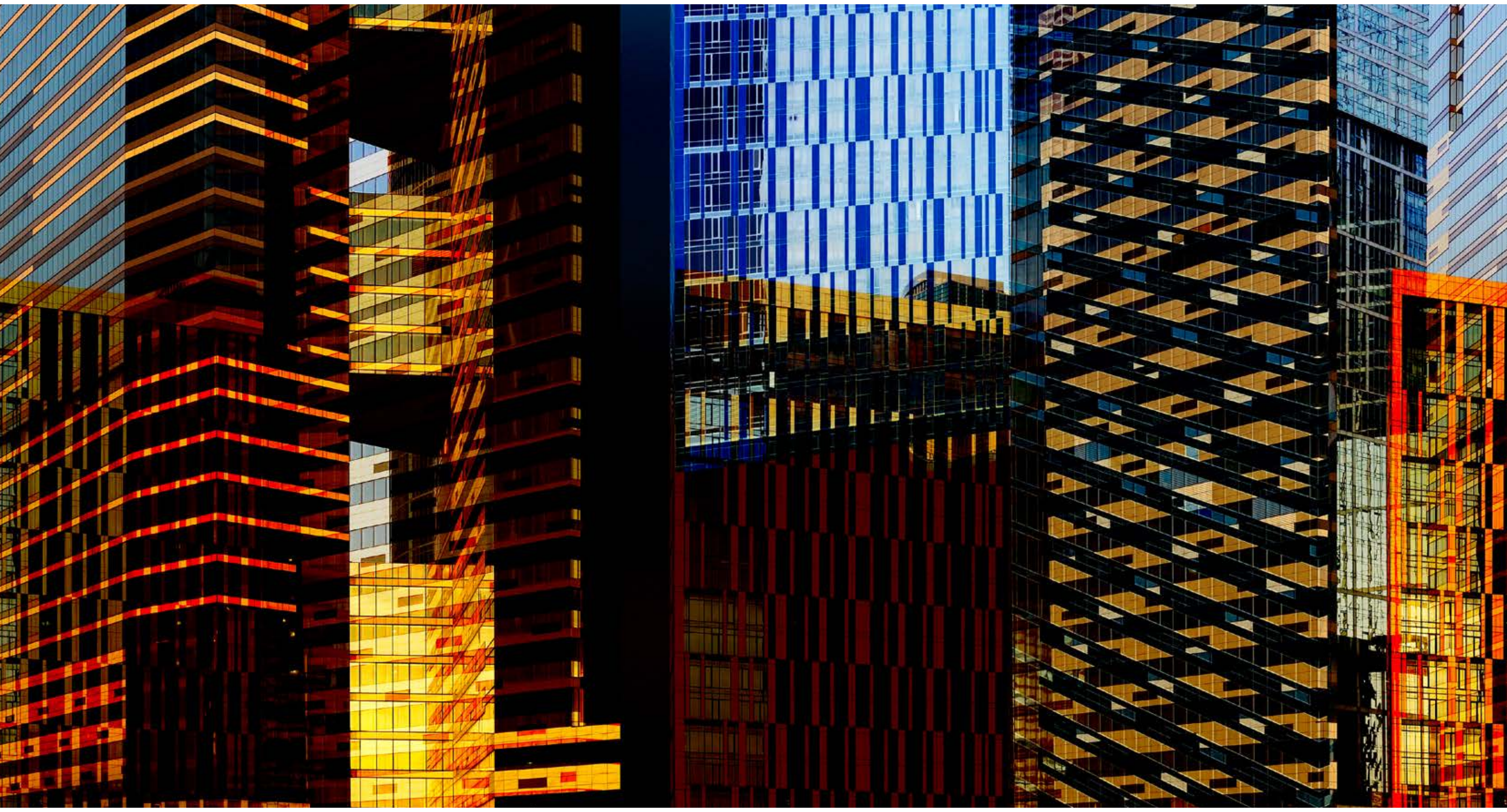
It was striking that in the space of three days in May. The Financial Times and Bloomberg, both highlighted this trend.

The FT's George Hammond wrote a whole page feature, `The developers still betting on the London office market' and Bloomberg's Jack Sidders' long read was headlined `Skyscrapers rising next to vacant towers market new City of London'.

But it's not just offices that are being eyed up hungrily by global real estate investors.

Hot sectors

Logistics property is continuing its hot streak, with Britain's biggest property company SEGRO reporting soaring profits in February, Blackstone continuing to spend heavily and FTSE-100 giant British Land entering the urban logistics sector through a new `Retail & Fulfilment' business stream.



Not surprisingly, e-commerce boomed during all three UK lockdowns, rising from an average 20% of UK retail sales to above 30% and still showing little sign of falling back. We explain later in this research the technological challenges this provides for retailers and logistics developers.

Life sciences has found a whole new fan club: having been the speciality of a handful of expert developers and owners like Reef Estates and US fund manager Harrison Street, the most sought-after and biggest assets for sale are now attracting up to 20 bids, showing the depth of interest.

The 'beds' sector includes retirement living, PRS and residential, which have all seen major spikes in interest. The latter two asset classes are attracting renewed focus as the world grapples with blended working where offices and homes share duties.

The sectors continuing to show real distress are retail and leisure, yet even in these arenas a spirit of reinvention is spreading, with a widespread acceptance that less retail and more residential, medical and education use in town centres could provide a winning formula.

Our 2019 report, Urban Being, highlighted the rise of the 'beds sector' and its impact on the future of our cities. Back then, only 47% of the real estate sector found residential an appealing asset class and only 58% favouring PRS, compared to a striking 70% and 74% respectively this year.

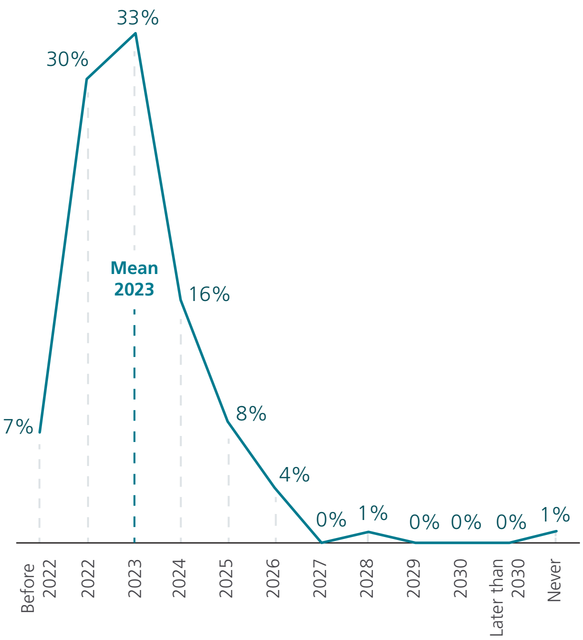
View the report here.

Recovery mode

This all adds up to a sharp rise in confidence across real estate, with 71% of those polled expecting the market to recover to pre-COVID-19 levels by 2023 or earlier, and 37% expecting a recovery to these levels by next year at the latest.

This is a staggering improvement in sentiment compared with summer 2020, when the sector was bracing itself for a difficult downturn.

Q: By what year do you expect the property market to recover to the pre COVID-19 level? (Real estate sector)



Almost two-thirds of those polled now describe themselves as optimistic which is a steep rise on 2020 among a traditionally bullish cohort. It is also, interestingly, significantly more optimistic than 2017, 2018 and 2019 when Brexit and the feeling that a long upswing was coming to an end weighed on sentiment.

As many people have said about COVID-19, the pandemic has accelerated trends, in this case shattering sentiment in spring 2020 before allowing for a reset (through tech) and a rebound now.

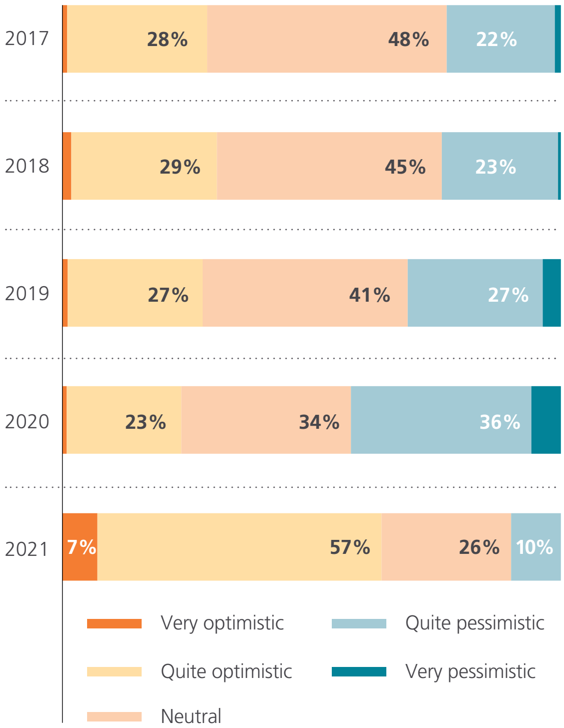
Perhaps this shouldn't be a surprise, given that the 2000s bull run was also brought to a shuddering halt in September and October 2008, eventually leading to a 44% fall in values before the recovery began in spring 2009.

With prices having fallen in a lot of cases, it is no surprise that a London market seen as overvalued by 70% of respondents in 2017 and 2018 is now seen as overvalued by only 47% – the lowest figure in almost a decade of our annual research.

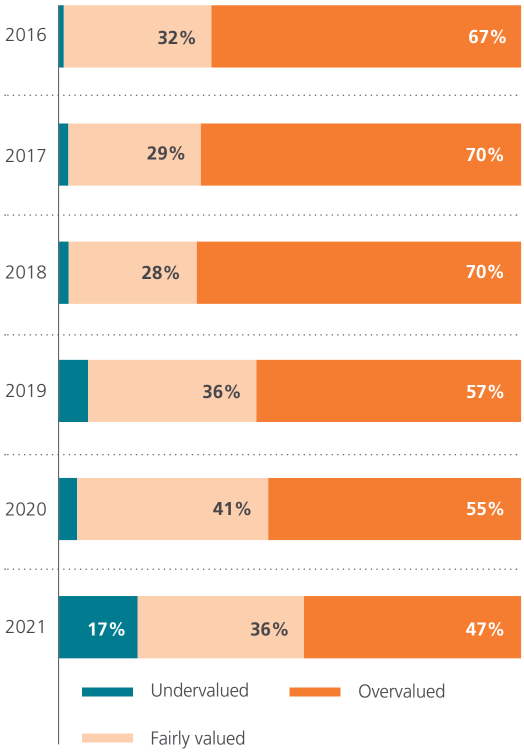
Given the global impact of COVID-19 this may still be seen as high, but development sites that can now accommodate the new breed of tech-enabled and ESG-compliant offices of the future are commanding a big premium, with long lists of developers circling them.

In every part of the real estate sector, from retail to logistics, and residential to offices, it is new development that fits into the tech and high-performing ESG bracket that has the brightest future, particularly against the backdrop of the ambitious net zero plans announced by an increasing number of governments.

Q: How optimistic or pessimistic do you feel about the UK real estate market in the short term? (Real estate sector)



Q: What is your current view of the London real estate market? (Real estate sector)



Bouncing back from COVID

Notwithstanding the stellar performance of distribution and logistics – with the sector also performing well across Europe, with Q1 take-up 30% higher than the five-year average – retirement living, the private rented sector and build for sale all saw strong increases in appeal in 2020-21.

The healthcare and life sciences sector, now found appealing by 82% of real estate professionals, is a clear focus as a result of the pandemic and the renewed importance of science and technology.

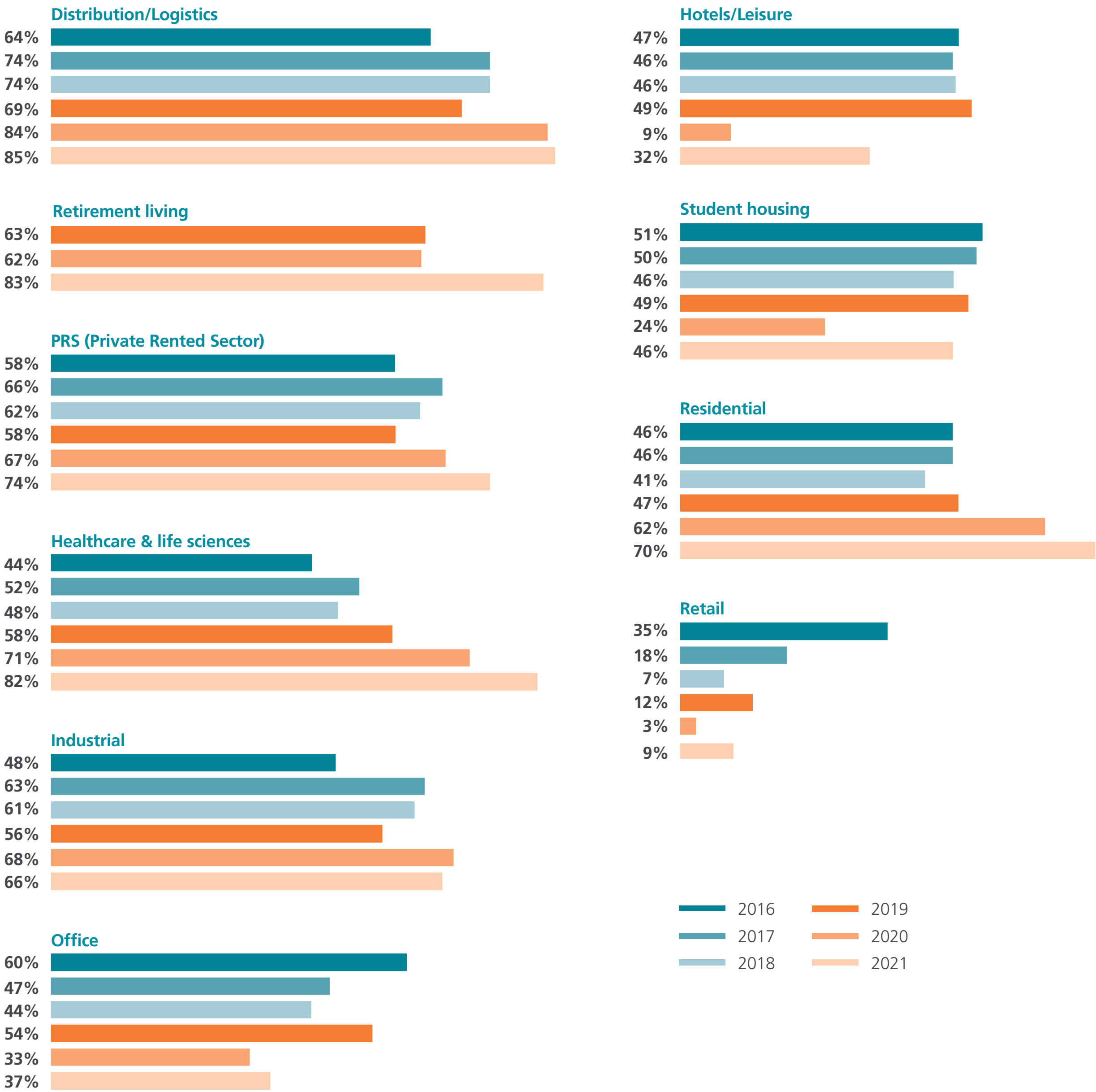
Retirement living is a particular hot spot, its appeal up by 21% on last year to 83%, with global investors such as Goldman Sachs (through its backing of Central London luxury over-65s developers Riverstone), Legal & General and AXA IM Alts all making large commitments to the sector. A wealthy ageing demographic and the importance of high quality, high tech accommodation where health and wellbeing have never been more important provide the post-pandemic context for this shift.

Other 'beds' asset classes including residential and PRS have also continued their rapid rise in appeal over the pandemic period. Residential is popular among 70% of our respondents, with PRS up for a second consecutive year to 74%. With home likely to be the part-time workplace for many of us for the long term, the demands and expectations for advanced technology to enhance the experience will continue to grow.

Sentiment towards hotels and leisure has seen a striking improvement over the last 12 months, with 32% saying they are an appealing investment prospect compared with a dismal 9% at the depths of lockdown – and pre-vaccines – last year.

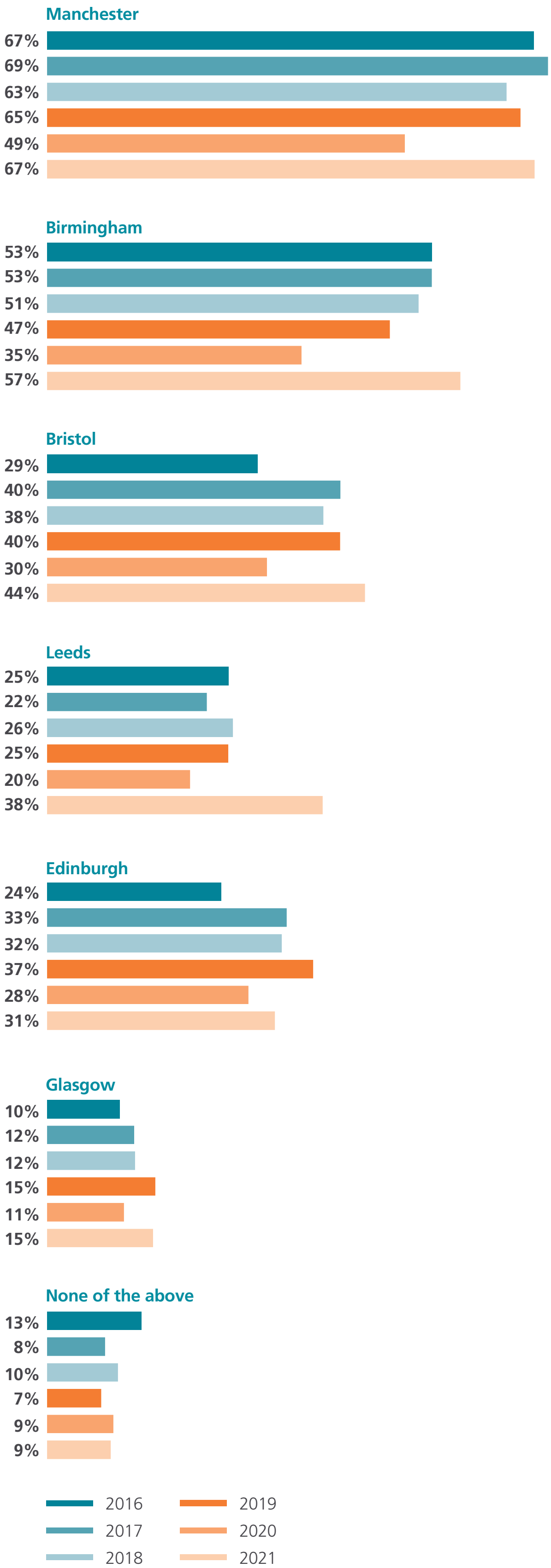
Student accommodation has also seen a near doubling of its appeal in the last year. When students appeared to be facing permanent online learning, and with overseas students apparently unlikely to return to the UK, 24% saw the sector as appealing. That has now risen to 46%.

Q: Please rank the appeal of the following asset classes on their level of appeal (Real estate sector)



Regions rebound

Q: Of the 'big six' regional cities listed below, which do you think are particularly appealing as investment prospects? (Real estate sector)



In common with the improvement in sentiment as a whole, regional cities are now seen as far more appealing than last year.

The property industry always respects strong and committed civic leadership, like that demonstrated by the Mayor of Greater Manchester Andy Burnham and the Mayor of the West Midlands Andy Street over the last 12 months. This may explain Manchester (67%) and Birmingham's (57%) strong showing this year as appealing regional centres. Bristol has also bounced back (44%), while Leeds has reached a six year high in popularity with 38% considering it an appealing investment opportunity, prompted perhaps by Channel 4's decision to relocate to the city.

Glasgow and Edinburgh have not seen comparable surges of interest, with many international and UK investors wary of the prospect of Scottish independence and its uncertain economic implications.

Real estate's GBP 6bn time bomb

Despite real estate's increased optimism, there is one huge cloud on the horizon: an estimated GBP 6bn of unpaid commercial rent since March 2020 in the UK alone.

The moratorium on enforcement action, preventing landlords from pursuing tenants for unpaid rent, has led to a stand-off, with landlords keen to collect money they believe is rightfully theirs and many tenants continuing to protest that they cannot pay.

In June the industry received a bitter blow with the news that the moratorium would be extended until March 2022, albeit with the government advising tenants that they should pay rent in accordance with their leases if they are open and trading.

Danielle Drummond-Brassington

Head of Real Estate Dispute Resolution, CMS UK

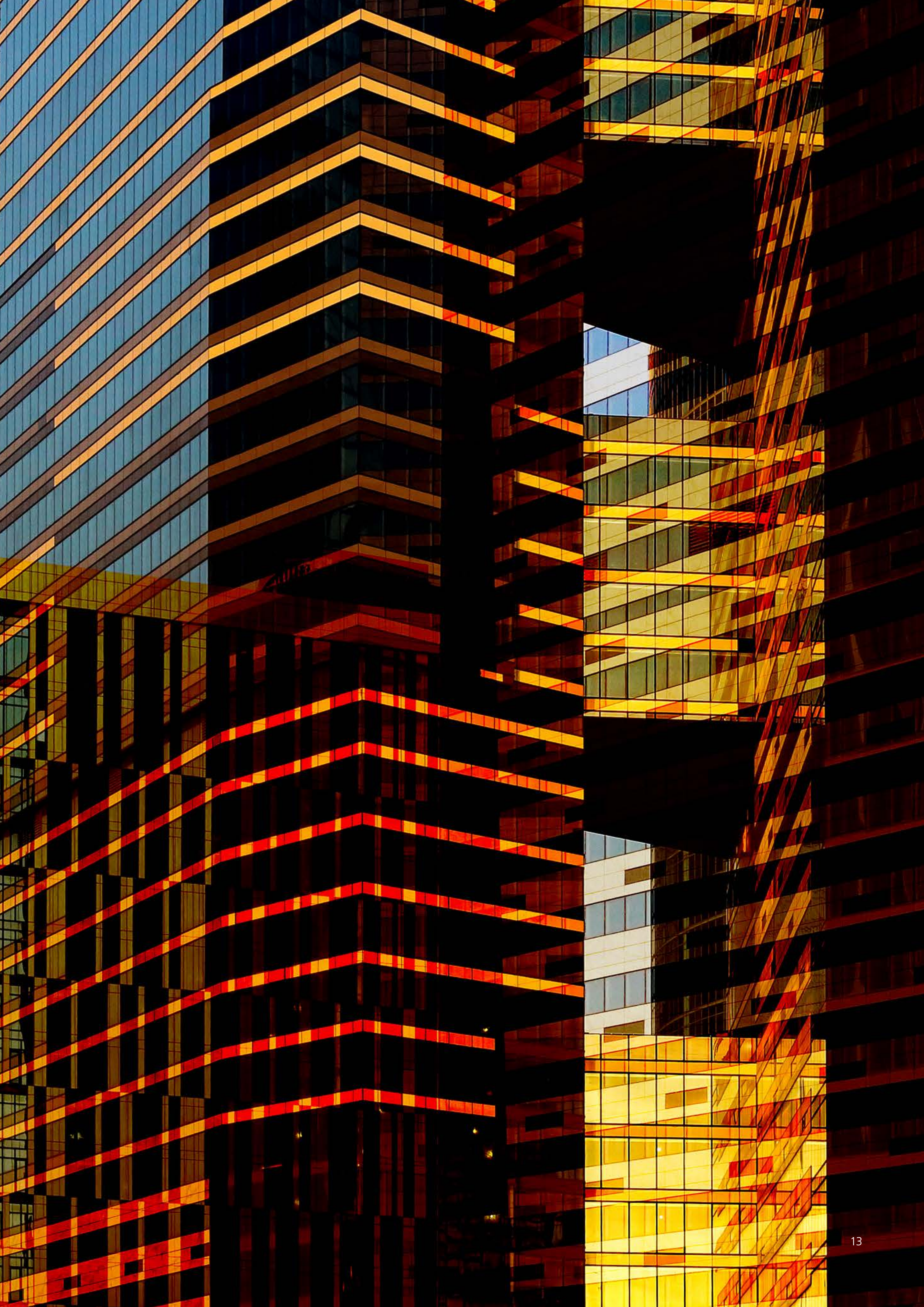
With the moratorium on evictions extended, Danielle commented in the Evening Standard and Reuters. She notes that: *"This is extremely disappointing."*

"Nothing is being done here to address or recognise the financial pressure landlords are facing, or that there are tenants out there who can pay but have been taking advantage of the government's measures. A short extension would have been understandable, but March 2022 is neither reasonable nor sustainable."

Asked what the consequences of a continued extension of the moratorium on unpaid rent would be, the response was stark: 60% said it would hit pension funds, 67% said it would encourage more rent default, 47% said it would hit investment by landlords and 46% said it would undermine good estate management. Only 25% thought in the long term it would support tenant recovery. Tech and ESG can transform real estate, but tenants still need to pay their rent. It is the best owners and properties that will find a solution, with weaker assets and defaulting tenants likely to be repurposed and swept away.

Q: What consequences do you think an extension of the moratorium will have? (Real estate sector)

Encouraging corporate restructuring (e.g. CVAs, restructuring plans etc.) to eliminate accrued arrears	70%
Encouraging more rent default	67%
Negative impact on pension funds	60%
Less investment in property by landlords	47%
Undermining good estate management	46%
Undermine foreign investment	34%
Stronger tenant recovery in the long term	25%
Other	7%
None	3%



A tech-driven transformation

The increasing importance of technology and digitalisation has come to the fore throughout the COVID-19 pandemic, particularly in the office market but also in life sciences, build to rent and logistics.

Technology's impact is profound, accelerating change in a real estate world which to many has changed little since the mid-1980s when fast-track construction was the last major innovation, pioneered by Sir Stuart Lipton and Godfrey Bradman when developing Broadgate.

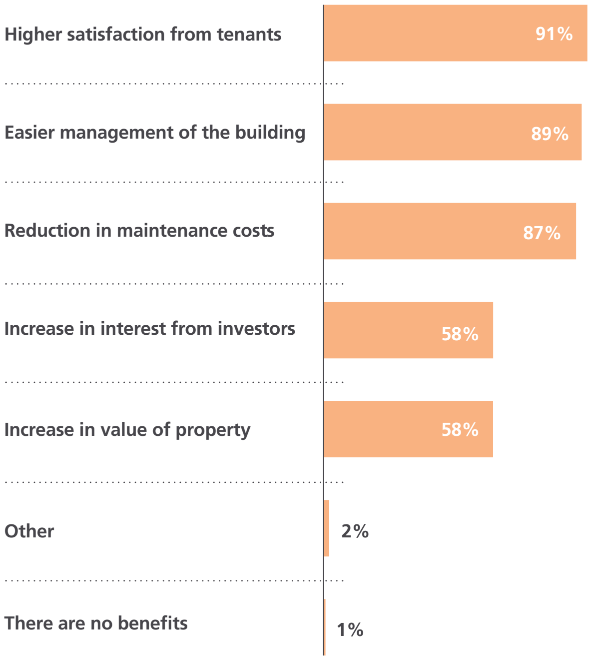
Since then, we have seen innovation in financing such as the introduction of various debt tools and real estate investment trusts, but little to compare with the revolution that has gathered pace in real estate over the last 12 months.

Importantly, there is now an acceptance that technology is a powerful force for change from the real estate industry itself.

The real estate professionals we polled also recognised the value of smart technology, with 91% saying it delivers higher satisfaction from tenants and 89% saying it allowed easier management of their buildings.

Interestingly, 58% of real estate professionals now see technology as increasing the value of property with 58% also saying it increases interest from investors. Technology is driving improvements in the sustainability of buildings, no doubt influenced by the ESG agenda of investors.

Q: What benefits can smart building technology give landlords? (Real estate sector)



A revolution on all fronts

There is a growing consensus that the next generation of real estate technology will bring unprecedented change to the industry, with the key trends predicted by industry commentators as follows:

- As the new hybrid world dawns it is seen as increasingly important that access to the office (in particular) be as convenient and stress-free as possible.
- Living and lifestyle are also now considered a fertile world for technology – but only in new developments.
- COVID-19 has accelerated e-commerce across Europe, with e-commerce in the United Kingdom rocketing from 20% of retail sales to 40% even after lockdowns have eased according to the British Retail Consortium.
- Big data is set to underpin the whole revolution.
- Technology is also seen as key to facilitating greater sustainability, with sensors, data and the best measurement crucial to enhancing ESG credentials, particularly in the challenging arena of retrofitting rather than redeveloping tired properties.

However, it is also recognised that barriers remain to the widespread adoption of technology, with big data in particular eyed with suspicion by tenants and customers. Three in four of those we polled said they were wary of the return on investment in smart technology.

Companies harvesting this data are viewed with distrust – with the Daily Telegraph among the first organisations to reconsider and then withdraw devices to monitor whether people are at their desk.

Our research across a range of fields, from the real estate industry, among office occupiers, renters and potential renters, retail experts and life sciences professionals, drew a striking response.

Where tech adoption and COVID collide

We asked the real estate sector office occupiers, renters, retailers and life sciences businesses what impact COVID-19 is having on demand for real estate in their area, and also on adoption of innovative technology.

The sweet spot for innovation and demand driven by COVID-19 is life sciences, where both the occupiers and the real estate professionals see equally positive opportunities. Driven by spectacular technological breakthroughs like COVID vaccine development, and with public and private sector funding pouring into the sector, life sciences is an asset class in the upper right quadrant, very much embracing the opportunity.

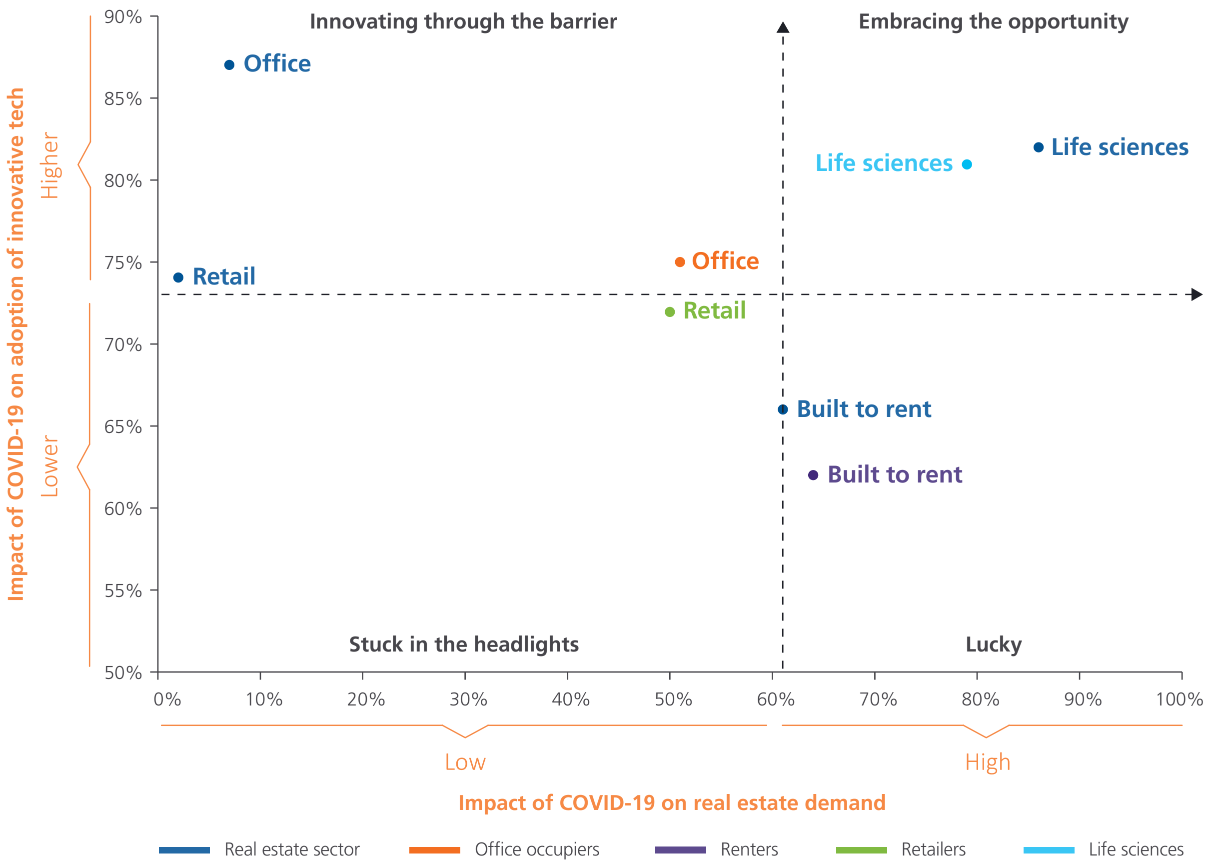
By contrast, in-store retail is `stuck in the headlights' according to our polling – beset by falling demand caused by lockdowns and less likely to have adopted innovative technology as a result of COVID. Interestingly, real estate professionals are significantly more pessimistic about real estate demand from the sector, than retailers themselves. This may be a reflection of increased demand for logistics space as a result of the accelerated shift to online shopping.

While real estate professionals see offices as the most actively innovating in response to the pandemic, occupiers are less convinced, although they also seem less pessimistic about demand for office space. This perhaps reflects the reality of a blended working approach which looks here to stay in the immediate future.

The build to rent sector, by contrast, is seen as `lucky' by renters who see that demand is strong but do not believe they are seeing enough innovation in the light of COVID-19.

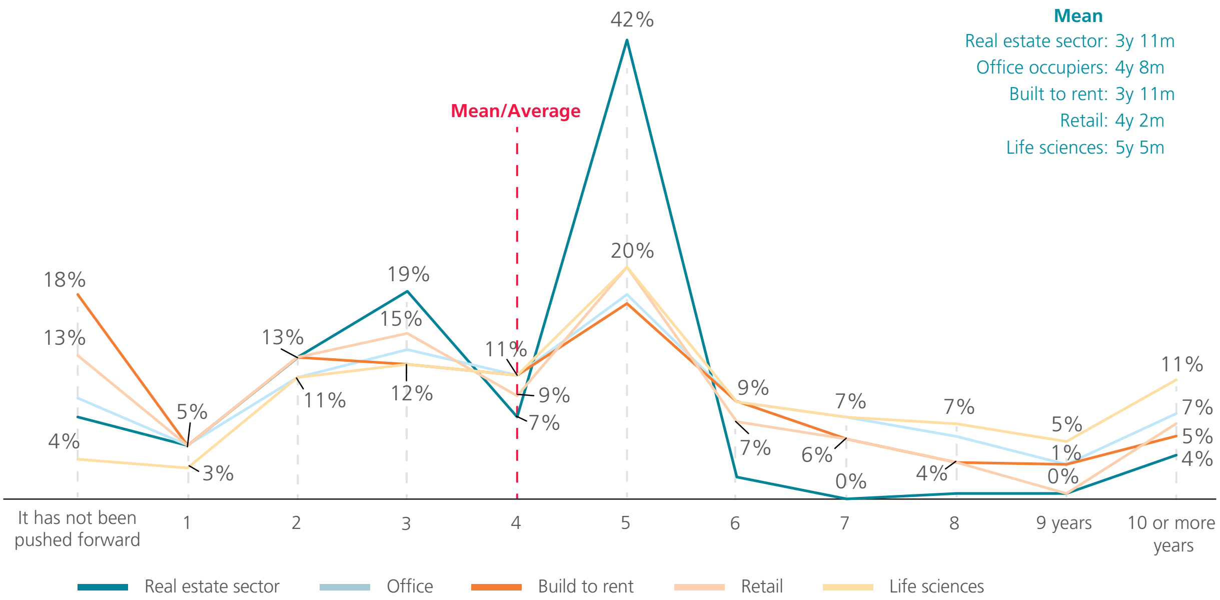
What is the impact that COVID-19 has had on the demand for office, residential, retail, and life science real estate?

What is the impact that COVID-19 has had on the adoption of innovative technology in office, residential, retail, and life science real estate?



Pandemic spurs accelerated transformation

Q: By how many years do you believe technological adoption in real estate in your sector has been pushed forward due to COVID-19?



Many people have speculated over how quickly COVID-19 has accelerated technological adoption within real estate – but now we have a view from more than 4,000 industry professionals, office occupiers, renters, retail experts and life sciences professionals: five years.

Across all groups this is the most common prediction although the mean response is four years. The impact of lockdowns and the need to rapidly embrace technology is extraordinary: how many people used Teams or Zoom for business 18 months ago?

"At the beginning of 2020 the real estate industry was broadly speaking 10 years behind where it needed to be. It has caught up massively – but is still three to five years behind where it needs to be, in my opinion."

Paul Bashir, Managing Director and CEO Europe, Harrison Street.

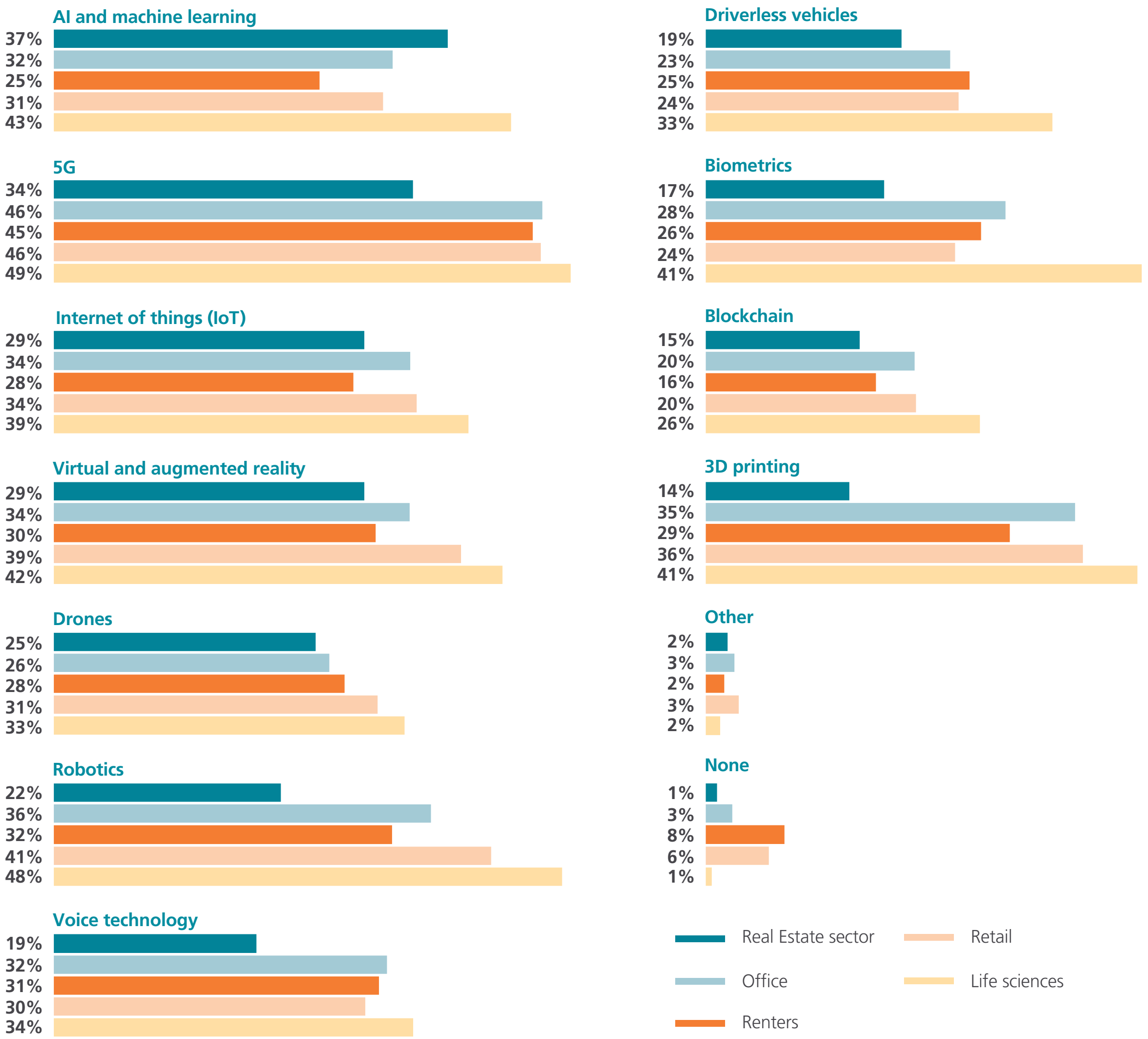
Robot world and the roaring 20s

Artificial intelligence (AI) and machine learning, 5G, IoT, virtual/augmented reality and robotics are considered the coming forces among real estate customers, which begins to explain how technology is expected to accelerate change in the sector during the 2020s.

These are profound changes which will not only impact how key industries are managed but also how they occupy real estate – and who occupies real estate on their behalf. Interestingly no one technology scores over 50%, suggesting views are divided on which innovations will have the most impact on the real estate overall.

Tools such as Amazon's Alexa have removed the mystique from AI as people have realised that it can make their lives easier, and it is perhaps not surprising to note that the highest acceptance of this technology is in arguably the most tech-advanced sector – life sciences.

Q: Which of the following innovative technologies do you think will have a significant impact on office, residential, retail, and life sciences real estate over the next 5 years?



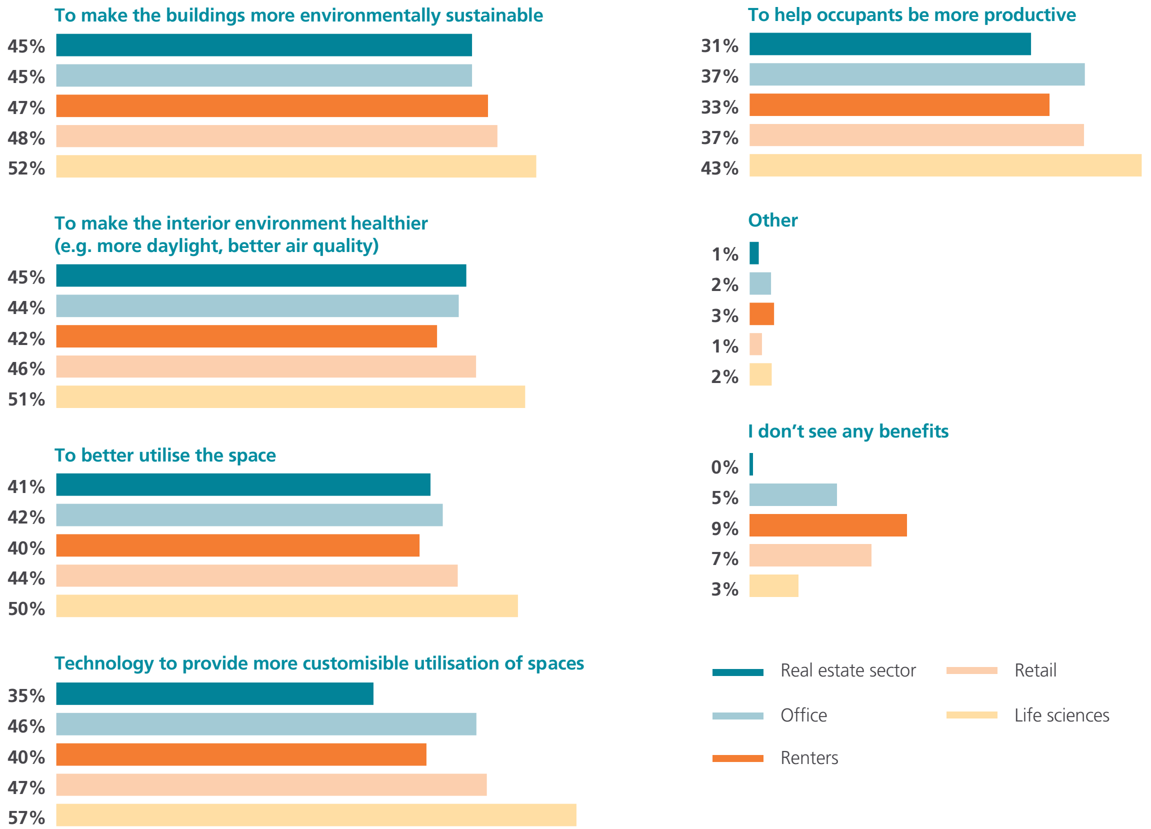
We asked real estate professionals, and occupiers across four key sectors, what technologies would have the biggest impact on real estate over the next five years.

While 5G is the technology most likely to impact all sectors of real estate, real estate professionals and life sciences occupiers consider AI and machine learning to be very important.

After 5G, robotics is seen as the most important technology for the life sciences sector, and for retail over the next five years, reflecting the automation involved in logistics and distribution. More surprisingly, office occupiers see robotics and 3D printing as the second and third most impactful technologies respectively for offices after 5G.

Real estate embraces data – at last

Q: How do you see the collection of data being used to benefit occupants in buildings over the next two years?



Real estate asset management is now data-rich, having for many years relied on a disparate set of metrics and a haphazard approach to measurement.

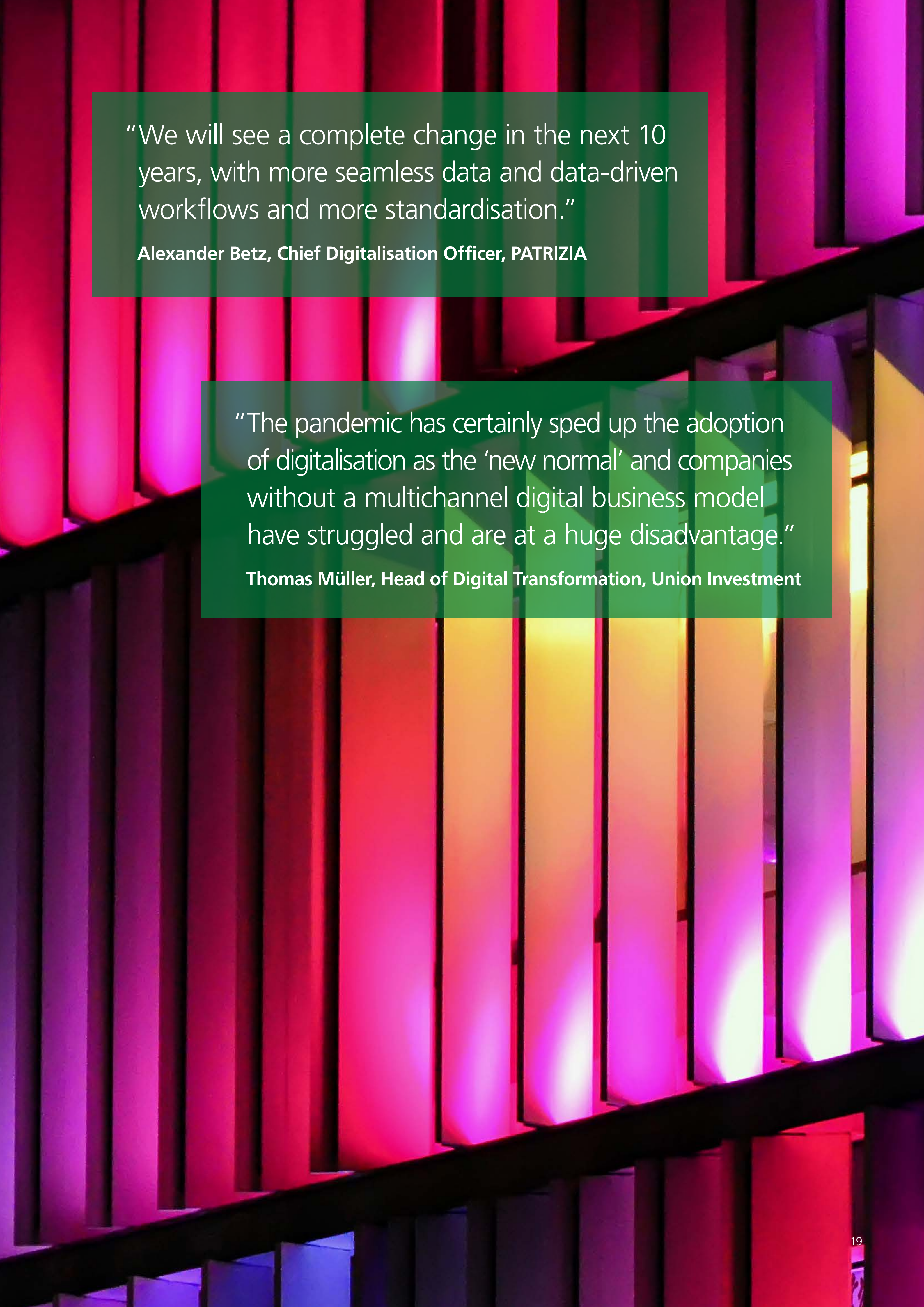
Given the value of most properties, this is surprising, because marginal gains can make a huge difference, particularly across a large portfolio if this level of discipline is repeated.

It is no surprise, therefore, that data collection is seen as a key tool as owners battle to meet tough sustainability targets.

At the same time, occupiers are also seeing the benefits of data collection, particularly around the optimal use of space. Yet again, the life sciences world is at the cutting edge of this thinking.

In our 2017 report, 'Smart. Healthy. Agile.', 65% of office occupiers said they were comfortable with technology that monitors their location in the office, despite concerns from the real estate sector itself about data protection law. Occupiers and landlords are now more in line, particularly when it comes to the use of data to improve the environmental impact of buildings.

View the report here.

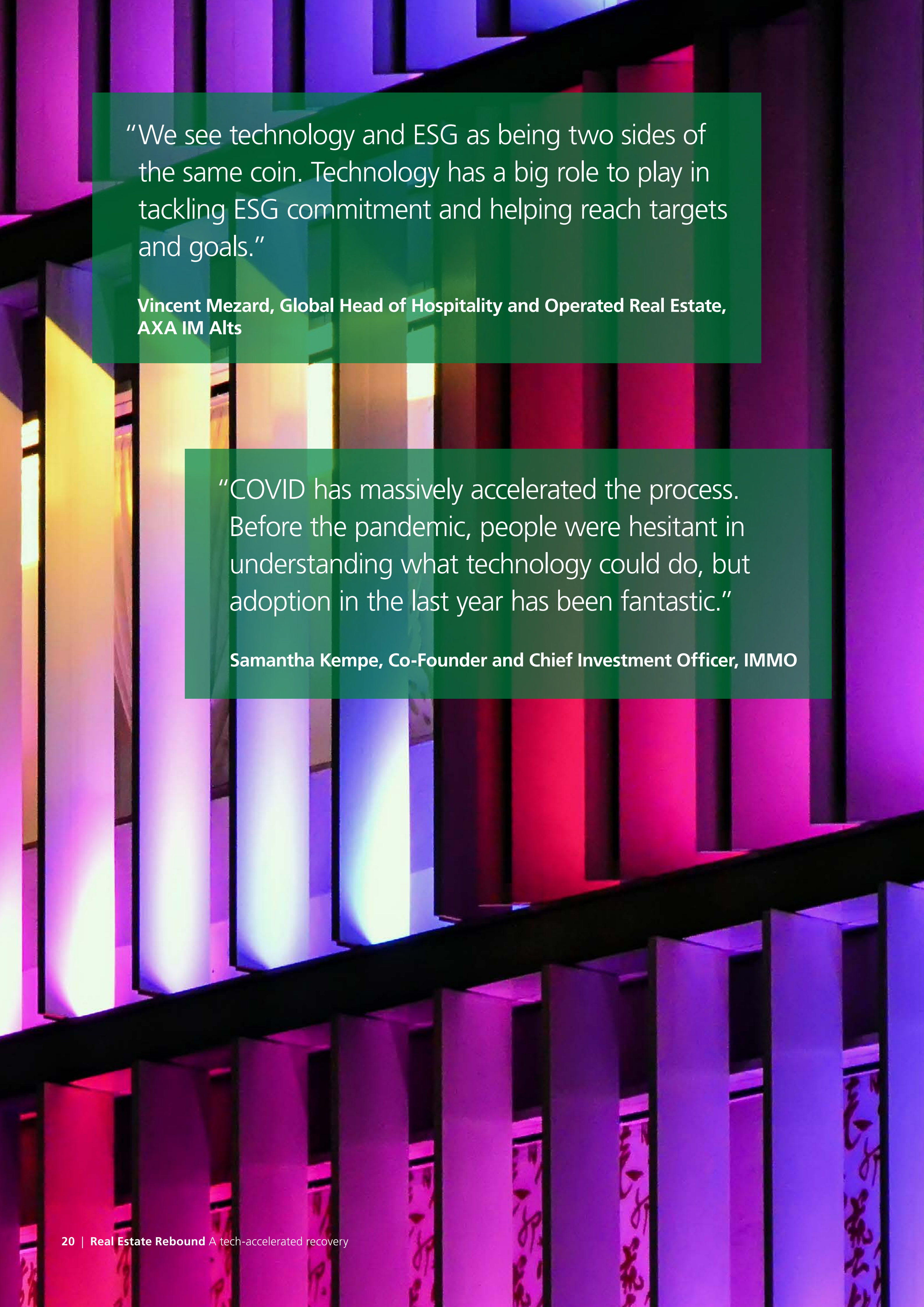


"We will see a complete change in the next 10 years, with more seamless data and data-driven workflows and more standardisation."

Alexander Betz, Chief Digitalisation Officer, PATRIZIA

"The pandemic has certainly sped up the adoption of digitalisation as the 'new normal' and companies without a multichannel digital business model have struggled and are at a huge disadvantage."

Thomas Müller, Head of Digital Transformation, Union Investment



"We see technology and ESG as being two sides of the same coin. Technology has a big role to play in tackling ESG commitment and helping reach targets and goals."

Vincent Mezard, Global Head of Hospitality and Operated Real Estate, AXA IM Alts

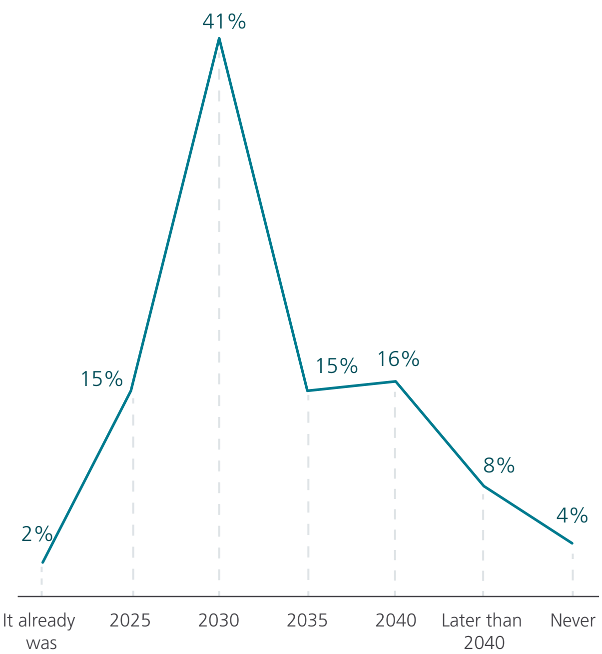
"COVID has massively accelerated the process. Before the pandemic, people were hesitant in understanding what technology could do, but adoption in the last year has been fantastic."

Samantha Kempe, Co-Founder and Chief Investment Officer, IMMO

However, there are also barriers to entry to smart building technology, with 76% of those polled citing a lack of proof of return on investment and 66% saying that technology is not widely enough available yet.

Tech drives push towards net zero

Q: By what year do you expect your company to achieve net zero emissions? (Real estate sector)



Real estate professionals have had a dramatic conversion in the last 12 months towards the principle of achieving net zero, according to our polling.

While the concept was barely understood two years ago – and industry experts were taken aback by initial global ambitions to achieve net zero by 2040 or 2050, the real estate sector has been galvanised into action by its investors and occupiers and is now looking to hit its targets by 2030-2035. Technology has to be at the heart of this: stakeholders from across the real estate world now have the motivation, financially and ethically, to create and utilise technology that can help create greener buildings.

In the last year the biggest players in UK real estate, including Aviva Investors, British Land, Landsec and SEGRO, have set bold targets to reach net zero, with most respondents expecting the real estate world to beat government targets by achieving net zero emissions by 2035 at the latest.

Real estate catapults ahead

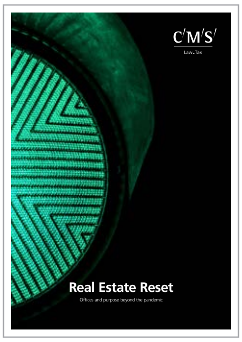
The dawn of proptech was 1980-2000 and saw the rise of software tools that made asset management easier.

Proptech 2.0 was 2000-2015 with the rise of the likes of Zoopla and Airbnb helping the consumer, in particular, to re-think their relationship with real estate.

We are now at the dawn of Proptech 3.0, driven by concepts such as AI, robotics, 5G, 3D printing and the Internet of Things, (IoT) which will create the biggest changes of all and will increase the speed of change after the seismic upheaval of COVID-19.

Many people see this as a fourth industrial revolution, representing a fundamental change in the way we live – a new chapter in human development enabled by extraordinary technological advances commensurate with the first, second and third industrial revolutions.

The impact on the built environment during the 2020s will be profound.



Last year's CMS report, Real Estate Reset, highlighted the importance of ESG to the real estate sector as it confronted the pandemic. At the time 65% of office occupiers said they would be willing to take a pay cut to work in an environmentally sustainable building.

View the report here.

Life sciences takes the stage

No sector is more reliant on technology and innovation than real estate's new hot asset class, life sciences.

We polled 250 life sciences professionals from around the world to discover their attitudes to new technology and found them to be far more advanced in their thinking and expectations than the other sectors polled.

These experts span agriculture, fisheries and food, biology, biochemistry and biotechnology, pharmacology and pharmacy, behavioural sciences, genetics, immunology, zoology and virology.

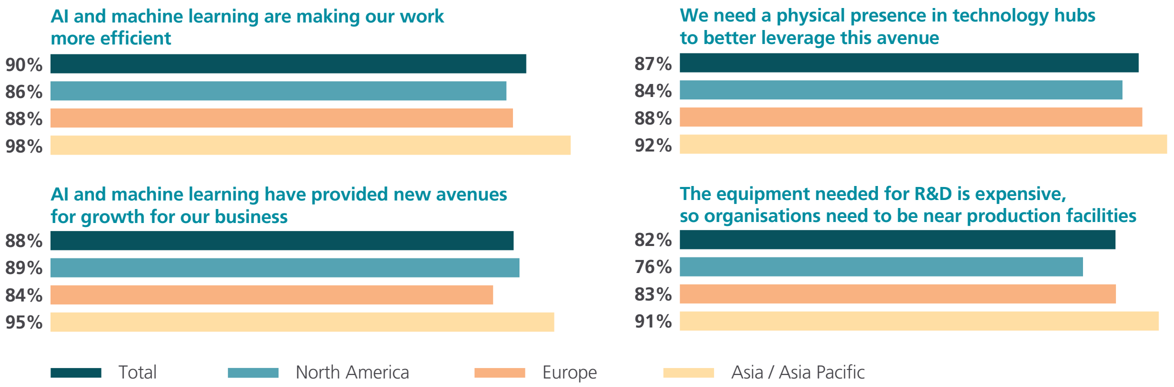
We spoke to various key figures within life sciences groups, with 83% either leading or involved in setting the strategic direction for their organisation, 77% playing a major role in operations and 70% playing a major role in their financial direction.

Their advanced thinking is illustrated by the fact that:

— 88% agree that AI and machine learning have provided new avenues for growth for their businesses

— 90% agree that AI and machine learning are making their work more efficient

Q: How strongly do you agree or disagree with the following statements? (Life sciences professionals – % agree)



War for property, war for talent

When Brockton Everlast struck a deal to buy a collection of assets at Cambridge Science Park in February from Legal & General Investment Management it highlighted the increasing interest for life sciences real estate in the sector.

This is backed up by the fact 82% of real estate professionals in this year's research rank healthcare and life sciences as appealing asset class, third only marginally behind distribution/logistics (85%) and retirement living (83%).

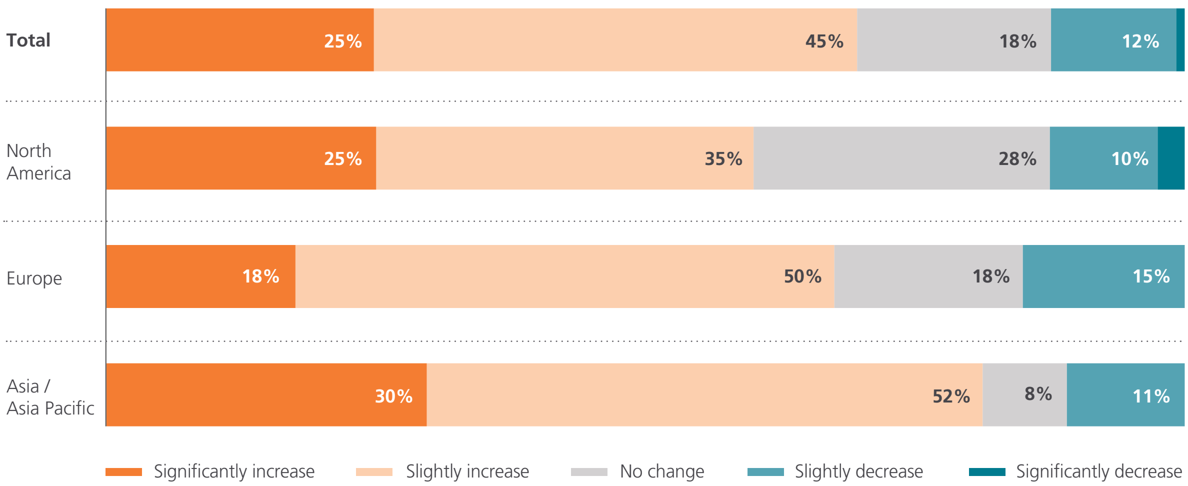
Developers and owners have been taking a crash course in wet labs and dry labs as reality dawns that the global healthcare crisis will lead to a huge rise in demand for life sciences real estate, with all the attendant complexities needed to supply this sector.

What is also striking is that life sciences professionals now favour city centre locations. For research & development, however, technology hubs are most favoured.

The war for talent, proximity to transport links, top class universities and access to non-UK staff are all factors in this finding, explaining why London's real estate sector is becoming increasingly excited about the development of a Knowledge Quarter along Euston Road.

British Land is one major owner who has spotted the potential, with chief executive Simon Carter using a May results presentation to say it is excited about the idea of repurposing its Regents Place office campus at Euston for healthcare and life sciences use.

Q: How do you expect the demand for physical space to change in your organisation over the next two years? (Life sciences professionals)



Location, location, location

As major real estate owners assess the potential for life sciences it is also interesting to ask whether the sector wants to be dispersed or centrally located. Which location provides the best environment to foster innovation?

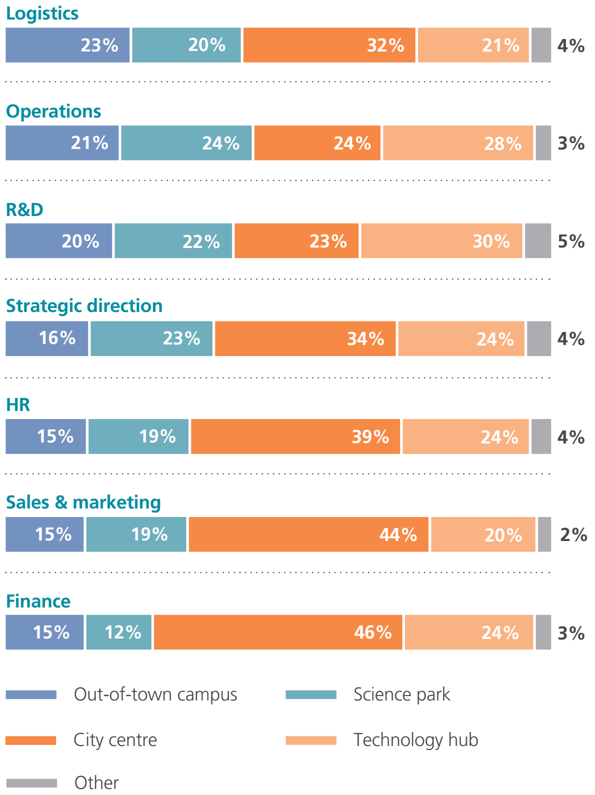
Almost 70% of those polled in Europe said they believed innovation would benefit from being concentrated in a single location.

The Francis Crick institute offers a lesson in how it works. Designed by global architect HOK, its defining internal feature is a system of walkways and gathering places, helping scientists who work at the Crick to meet in serendipitous get-togethers, allowing them to spark ideas off each other – all in one place.

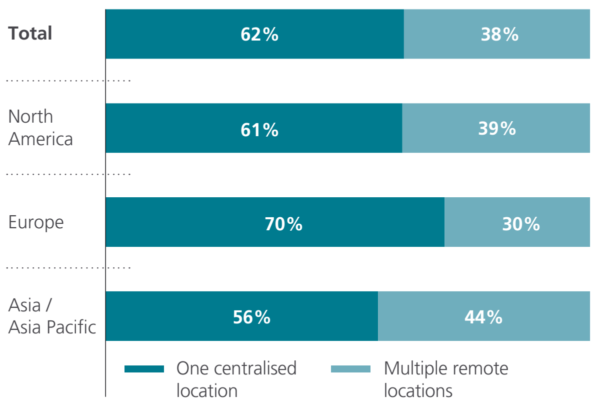
According to Savills, GBP 19.8bn was poured into UK life sciences real estate in 2020 – 23% more than in 2019. The figure for 2021 seems certain to grow again.

The big challenge now for real estate developers and owners is to raise their game to meet the highly technical demands of a sector that has rocketed to prominence due to COVID-19.

Q: Which location would most benefit the following job functions for your organisation? (Life sciences professionals)



Q: Theoretically, which of the following locations would most benefit your organisation overall? (Life sciences professionals)



"There is an understanding that you cannot work in life sciences from home… there will always be a need for wet lab and dry lab space, although dry lab can often be misunderstood as office space."

James Sheppard, Head of Commercial UK & Ireland, Kadans Science Partner

Kadans Science Partner

James Sheppard
Head of Commercial UK & Ireland

Please tell us about Kadans

Kadans is a specialist science and technology developer which from the 90s onwards has delivered life sciences space, starting with our first multi-let laboratory in 1998. From then we partnered with universities to deliver commercial science space on campuses, and we have branched out from there.

At the time universities didn't want to become too heavily involved with real estate, so we provided a bespoke development and delivery service for them.

By 2010 demand for life sciences was becoming more mainstream – and not just in our Netherlands home – and Kadans was eventually acquired by Axa in 2020.

We now have a deeper footprint, in The Netherlands, Germany, Spain, the United Kingdom and beyond, which gives us the opportunity to think in longer-term horizons.

Q: How has the COVID-19 pandemic affected what Kadans does?

A: Our market has accelerated phenomenally in the past few years, which has been in part a result of COVID-19, but the structural changes were happening before this.

Before the pandemic the main driver was an increase in public and private sector capital into life sciences, with the volume of venture capital money attracted increasing year on year for at least a decade.

Then COVID-19 happened: life sciences entered the mainstream consciousness, with the world realising the importance of programmes like vaccine manufacture and research & development.

Life sciences was on the periphery of real estate, but it's now centre stage.

At the same time, with massive changes in the way people work and shop, traditional developers are now exploring alternative use classes, which has created a perfect storm of interest.

Q: How is life sciences development changing?

A: There is an understanding that you cannot work in life sciences from home – for many types of business they will always need to be in the lab, and there will always be a need for wet lab space (where drugs, chemicals and other types of matter can be analysed and tested by using various liquids).

There is also a need for dry lab space (where the focus is more on mathematical analysis via models or simulations). Although we are seeing an increase in the need for dry lab space, this is often poorly defined and can sometimes be misunderstood as office space.

We now almost act as a community manager for our tenants – some of the world's biggest science groups including GSK, Philips and Merck are among our customers, but we also cultivate small, venture capital-backed groups. Our sweet spot is companies around the series B (funding) mark on a fast-growth trajectory

The biggest changes are around sequencing technology, which means businesses generate vast volumes of data and we need to provide data resilience that is far greater than before.

Q: How is life sciences development different from office development?

A: Barriers to entry and challenges are everywhere. Lots of landlords think they can just repurpose office buildings but for a start slab to slab heights are much bigger. And labs are always changing by as much as 10-15% a year.

The second barrier is around operations. One small example is if you put labs anywhere other than the ground floor you need to get liquid nitrogen to the first floor and above. Here you need to ensure your lift is suitable for carrying this type of liquid.

The burden of responsibility is greater for the landlord than it is with offices. Risk assessments are crucial, and you do need a level of understanding about what your occupiers are doing.

Q: What is the future for life sciences development?

A: The big challenge will be `how do you make these buildings more sustainable?'

We need to move them away from BREEAM box-ticking, but that will come in time.

We are proud of our Plus Ultra (for fast-growth small and medium-sized enterprises) and Accelerator (for corporate tenants) brands, with unique construction methodology involving bigger spaces and a blend of concrete and steel creating a more efficient grid.

As a general comment, real estate is much slower in adopting technology. As an industry we are so much more risk-averse than Kadans's tenants.

But overall I am extremely positive – there is a huge amount of opportunity, triggered by an understanding at last of what is needed for humanity.

Harrison Street

Paul Bashir

Managing Director and CEO Europe

Please tell us about Harrison Street

Harrison Street is a leading investment management firm exclusively focused on alternative real assets. Since its creation in 2005, the firm has specialised in senior housing, student housing, healthcare, life sciences, storage real estate and social and utility infrastructure. We have invested USD 41bn across these sectors across North America and Europe.

Q: What is your role at Harrison Street?

A: I lead our European operations as well as sitting on boards for Harrison Street's European funds responsible for the expansion of Harrison Street's European strategies. We believe strongly in the alternative real asset sectors in Europe, and their tremendous growth potential.

Q: What is your perception of technology in real estate?

A: Five years ago, in a well-attended European conference, I was one of few senior executives present who identified technology as one of the biggest threats and opportunities to our industry. Five years on, the real estate industry still lags behind other sectors, but it has caught up massively in recent years – helped by forced adoption through the recent pandemic. Technology and the correct implementation thereof is one of the most important success factors of our generation of real estate leaders.

Q: What has changed in the last 18 months?

A: At the beginning of 2020 the real estate industry was broadly speaking 10 years behind where it needed to be. It has caught up massively – but is still three to five years behind where it needs to be, in my opinion.

Alternative real assets are driven by demographic trends, which in turn are fuelled by rapidly evolving consumer trends. The pandemic has accelerated the rate of adoption of technology by both consumers and businesses and has in a relatively short period of time accelerated the rate of proptech adoption.

No sector exemplifies this increased rate of adoption more than build to rent, where technology has lubricated the whole experience during COVID.

During lockdown, people have needed to interact more with their buildings and local environment. Technology has hugely increased the ability for experiential initiatives to be executed and for property managers to execute a very difficult and rapidly changing environment within their communities.

Q: Can you give an example of this experience in practice?

A: We use Utopi, which describes itself as a data integration platform that provides real-time insight and analysis across a portfolio. Its dashboards aggregate operational and environmental data from sensors to benchmark performance.

Importantly, Utopi – which we use in properties we have invested in and which are managed by Apache and Moda – also allows residents in these buildings to track its performance, allowing people to see the benefits of managing, for example, heating and lighting.

We have also introduced Utopi to our student accommodation assets and saved 8% to 10% in energy costs at these buildings – which is incredibly accretive to our funds.

Q: Where does ESG fit into your vision of technology?

A: We have a dedicated team of four people within Harrison Street, enhancing ESG performance across all of our fund products and within our corporate organisation. Technology plays a key part in every aspect of our ESG strategy – from capturing data to driving new building and operational techniques to optimising performance.

ESG is one of our key priorities across our global firm and is central to our investment and deal selection strategies.

Q: How important is technology in life sciences real estate?

A: Life sciences operate at the crossroads between large pharma, technology and education. Research and development incubators have technology at their heart, and are pivotal to how life sciences real estate functions. Incubators are collaborative spaces with multiple tenants on varying lease lengths – collaborating together towards a common goal of delivering world-leading life science solutions. Technology is the catalyst that makes this possible.

We are only just beginning to realise the potential of technology in life sciences and real estate as a whole.

At Harrison Street we want to be at the forefront of technology adoption and to always be exploring ways to improve our communities which we invest in.

Tech drives logistics lockdown boom

Whether it's data analytics, AI or robotics, few real estate asset classes rely on technology more than logistics and by extension retail. The continued adoption of innovation in this sector is a clear example of the power of technology to support a real estate rebound from the pandemic.

To gauge future trends and demand for logistics there are few better groups to poll than retail professionals, with e-commerce driving the sector through the pandemic as people were forced to shop from home.

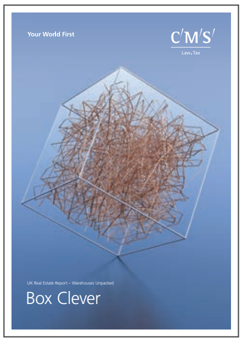
We polled 600 retail professionals around the world, to ask their views on how their own customers' demands are changing.

Technology dominates their thinking, as they are pressed ever harder to rapidly adapt.

Our retail professionals said that the top two challenges for the retail industry in the next two years will be meeting consumer demands for even faster delivery and ensuring consumer data is protected, with 43% claiming each will be very challenging to overcome.

Over the next two years, retailers also expect mobile commerce and AI (being used to analyse big data) to have the biggest impact on the way the logistics industry operates in their country, with 37% and 33% respectively believing they will have a significant impact.

Over eight in 10 (82%) agree that AI and robotics will play a key role in increasing the efficiency of last mile logistics.



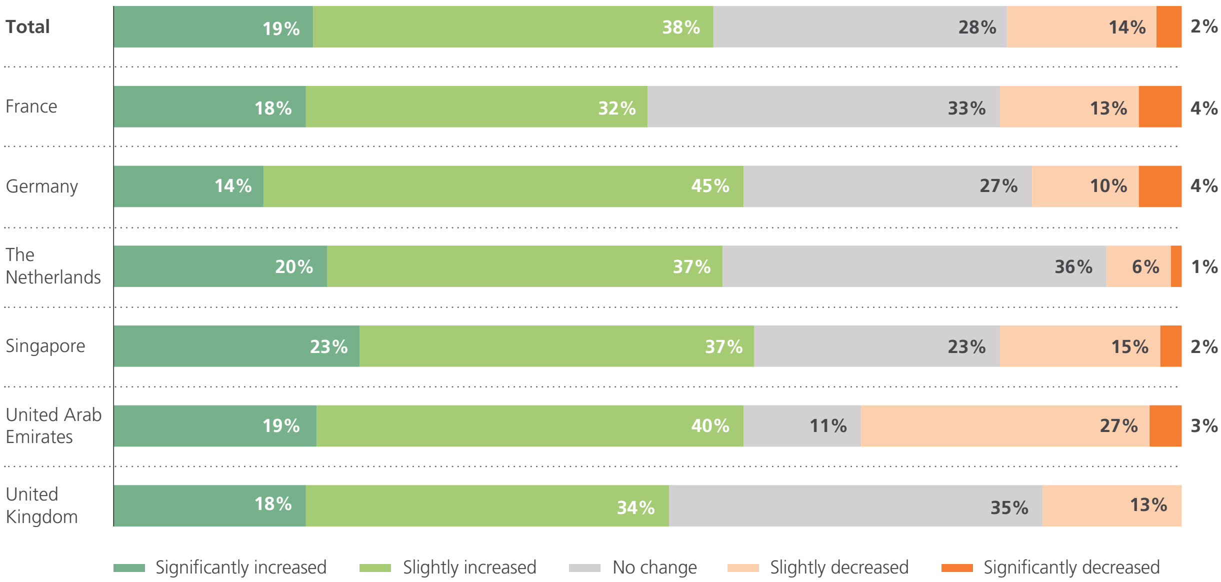
In 2018 our research report on the logistics sector, Box Clever, said that 91% of real estate professionals thought there would be an increase in demand for autonomous warehouses within two years, compared to just 52% of retailers. Three years on, robotics is seen as the second most important technology by 41% of retailers, after 5G.

View the report here.

Once a less attractive investment in the real estate world, warehouse and industrial property has become an established hot ticket. This year's research highlights that 56% of retailers have seen an increase in demand for warehouses and logistics as a result of the seismic changes triggered by COVID-19.

Warehouse – or logistics – real estate is no longer just about location: technology is now a driving force, as we can see through the innovations being introduced by some of its biggest occupiers. Combined with the ESG revolution, the picture is changing rapidly.

Q: How has your organisation's demand for warehouse and logistics capacity changed because of the COVID-19 pandemic? (Retail professionals)



The home delivery boom driven by COVID-19 is expected only partly to recede, stabilising at around 30% of UK retail sales from 20% pre-pandemic, which has continued to fuel investor demand but has also thrown up new challenges for a sector growing at such a pace.

European logistics investment soared to EUR 39bn during 2020, marking a record year for transaction volumes, up 5% year on year and 24% above the previous five-year average.

So how does the sector continue to grow? Almost half of the retail experts we polled cited the insatiable demand for even quicker customer delivery as the biggest challenge.

Autonomous vehicles are also expected to have a big impact, and electric vans and lorries already being hailed by the logistics world as their answer to the environmental lobby concerned by diesel van deliveries.

Leilah Rawle

Real Estate Partner – Energy, CMS

"The full lockdown in the UK during the pandemic created a significant reduction in traffic and pollution levels which, coupled with the UK government's ban on the sale of new petrol/diesel cars in 2030, created an increased focus on both the benefits of emission free electric vehicles and the insufficient numbers of EV chargepoints. There are currently about 7,000 chargepoints installed in the UK each year, yet it is estimated that this needs to rise to 35,000 per annum to hit the government's 2030 target. Over the last 12 months, we have seen a strong push from EV chargepoint operators to partner with significant landowners and tenants to install their infrastructure at a large number of sites. For example, we acted for Instavolt on their UK-wide roll-out of their EV chargepoints at McDonald's Drive Thru sites."

Q: How challenging do you think the following will be for the logistics industry to overcome over the next two years? (Retail professionals)

	Very challenging	Slightly challenging	Not challenging
Consumer demand for even faster delivery	43%	46%	11%
Ensuring consumer data is protected	43%	45%	13%
Anticipating future demand of consumers	41%	48%	10%
Availability of staff with the right skills to work in warehouses and the broader sector	40%	46%	14%
Ensuring warehouses are efficiently and sustainably built	39%	48%	13%
The impact of the 'returns culture' and associated cost of reverse logistics	36%	50%	14%
Planning constraints	36%	58%	7%
Lack of viable space in and close to urban centres	35%	50%	15%
Keeping pace with technological change affecting warehouse operations and delivery methods	35%	54%	11%
Retailers being resistant to sharing warehouse space	32%	49%	19%
Better understanding and using 'big data' in the supply chain	31%	52%	17%

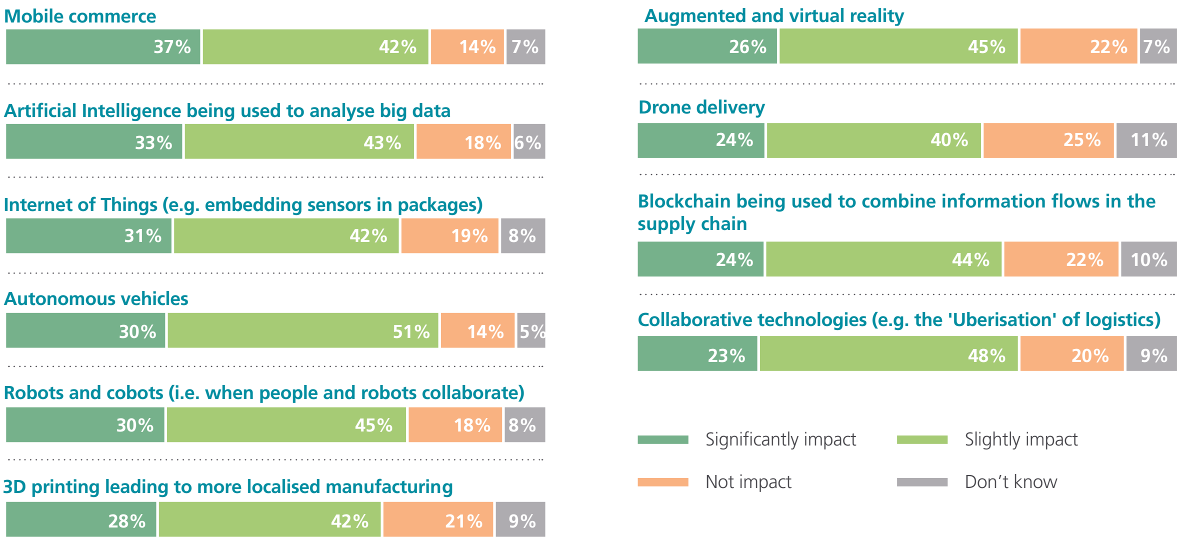
The scale of technological change in the logistics world is evident from most of the 600 retail professionals we polled. Many expect that AI will be used to analyse increasingly data and that the Internet of Things will soon see sensors embedded in packages.

82% of those we polled said AI and robotics would play an increasing role in the efficiency of last mile logistics, and 73% said drone delivery and autonomous vehicles will dramatically reduce turnaround times for delivery.

This sector is also increasingly confident in its importance, with its combination of cutting-edge technology and help in keeping economies afloat during the pandemic leading 80% to say that state-of-the-art logistics is key to supporting the future economy.

But there are some clouds on the horizon: margins for retailers are wafer thin, and the cost of returns and `reverse logistics' of repackaging goods for sale are also weighing down on retailers.

Q: How do you think the following technologies will impact the way the logistics industry in your country operates over the next two years? (Retail professionals)



"Industrial buildings present several unique challenges for smart technology, not least their sheer size, which is one reason it's still in its infancy in the industrial sector. While customers are responding very positively and there is a shared interest, we have more work to do to make the product simpler and lower cost."

James Power, Director of Digital and Technology, SEGRO

SEGRO

James Power
Director of Digital and Technology

Can you please tell us about your role at SEGRO?

I lead the development and execution of our digital and technology strategy. I've been with SEGRO for 10 years during which time the common theme in my work has been technology. Over the last three years we have increasingly embraced digital innovation as we – alongside our customers and our stakeholders – started evolving our business and our portfolio to the increasingly digital world. We own, manage and develop modern warehouses and light industrial property totalling over 8 million sq m of space across the UK and Europe, serving customers from a wide range of industry sectors.

Q: How would you define SEGRO's digital and technology strategy?

A: Ultimately the strategy is geared towards enabling us to achieve advantage from our digital assets – complementing our people and our real assets. There are a number of strands to our approach, but at the core is helping our people right across the business be as effective in their jobs as they can be. In real estate, the decisions we take are relatively few, but high-value and have a long impact. Our second focus is bringing better data and insight to the table to enable better decision-making. Thirdly, the digitalisation of back-office processes will make them as agile and cost efficient as possible – enabling the 'front end' of the business to be entrepreneurial and continue to deliver growth. Finally, adopting digital innovation helps positively differentiate our assets to perform better and improve our services to customers.

Q: How is SEGRO implementing new technologies in its buildings?

A: We're constantly innovating with new technologies in our buildings, but one we've invested a lot of effort in recently is a programme of smart building pilots. We've installed a range of smart technologies in a representative range of buildings – small and large; light industrial and big box; vacant and occupied – in the UK and on the Continent. Working in close partnership with our customers, the programme is exploring the practicalities and benefits of a range of technologies which we believe will improve the operational performance of our buildings – especially environmental and wellness performance.

Q: What learnings have you taken to date from this smart building pilot?

A: We've had a very positive response from our customers who – while having a very diverse range of requirements – are very clear in agreeing that sustainability, environmental performance and employee wellbeing are right at the top of their agendas. Over recent years the industrial customer-base has diversified and the operations within warehouses have become more sophisticated but the physical envelope – the warehouse itself – has not always evolved at the same pace.

Q: Can you give us an idea of the kind of technologies you are implementing?

A: We're using the latest generation of sensors to deliver real-time data on utilisation and the environmental, energy and plant performance of the building, to complement the operational data many of our customers already collect. This data gives our customers and ourselves better visibility and understanding of the performance of the building, enabling better decisions, which has multiple benefits. For our customers the data should improve the operational and energy efficiency of the building, reducing costs and carbon emissions. A better understanding of space utilisation and environmental conditions also leads to better working environments, positively impacting employee wellbeing and productivity.

These improvements should also in turn make a smart industrial building more sustainable and attractive to local communities.

Q: What are the main challenges which lie ahead?

A: Industrial buildings present several unique challenges for smart technology, not least their sheer size, which is one reason it's still in its infancy in the industrial sector. While customers are responding very positively and there is a shared interest, we have more work to do to make the product simpler and lower cost.

We are learning all the time. There is no template to follow, so we maintain an open, ambitious approach and are prepared to try new things. As a long-term investor, developer and manager of industrial space we have a shared interest with our customers to stay ahead of the curve and ensure we are embracing the best technology that delivers high-quality, high-performing and sustainable buildings.

SEGRO Park Tottenham, London

Smart leap for build to rent

For landlords smart buildings will deliver higher rents, for tenants technology will be an increasingly important enabler for the work from home revolution, and for both innovation will help support a more sustainable future.

We spoke to 1,500 renters around the world to gauge how they view their home in the light of the working from home revolution triggered by COVID-19.

With most renters never anticipating spending so much time in their apartments, let alone working there, the concept of service-focused build to rent has been fully put to the test.

And it is smart building technology that has come through with flying colours in the world of build to rent:

- Smart buildings will deliver higher rents, with renters and potential renters willing to pay 20% more on average in rent to live in a building with smart technology provided by the landlord.
- Eight in 10 of those we polled agreed that smart technology makes buildings more sustainable.
- Just under half (47%) said they find living in a building that has net zero emissions very important, with this number highest (68%) in the United Arab Emirates and lowest in the UK (33%).
- The key benefits of smart building technology in a residential building are an increased sense of safety and more convenience.
- Sustainable power generators like solar panels are the most appealing smart building technology to renters, with 54% finding them very appealing.

Virtual and augmented reality viewings are exciting to renters around the world, with the 250 United Arab Emirates renters we polled expecting the biggest impact, closely followed by those in Singapore.

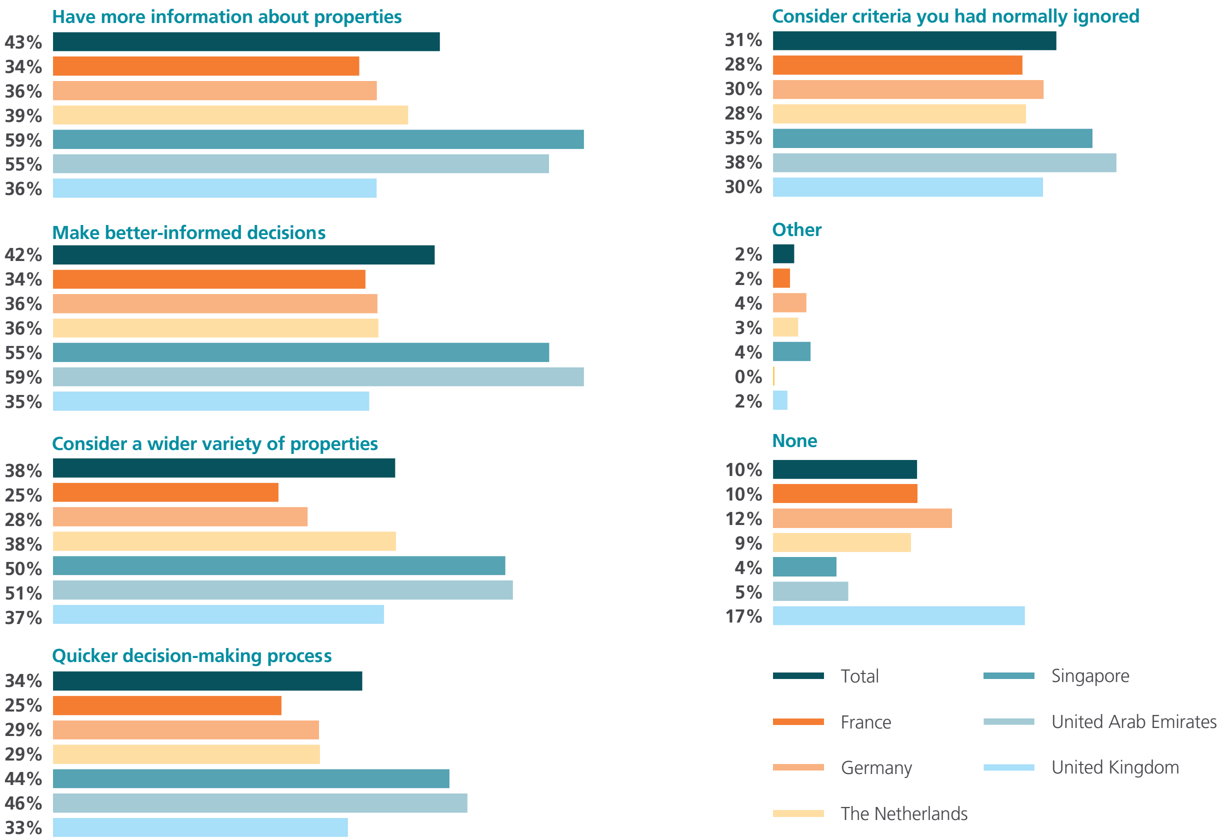
There is still a strong preference to physically view a property before agreeing to rent, but tech allows renters to sift out options more readily.

Overall, build to rent has had a good pandemic, with people valuing their homes as they spend more time in them and enjoying the benefits of new-build developments with amenities ranging from organised digital cooking classes to resident apps which give local health updates.

With occupancy in most UK build to rent assets remaining above 90%, and rent collection at high levels, investors have realised that the sector is more robust than some more traditional asset classes. Even in a pandemic and with multiple UK lockdowns, people need somewhere to live.

This is reflected in strong investor interest in the sector, with CBRE reporting that a record GBP 3.5bn was deployed in UK build to rent in 2020, up 30% on 2019. The momentum continued into 2021, with Savills saying that GBP 1.2bn was invested in the first quarter of the year.

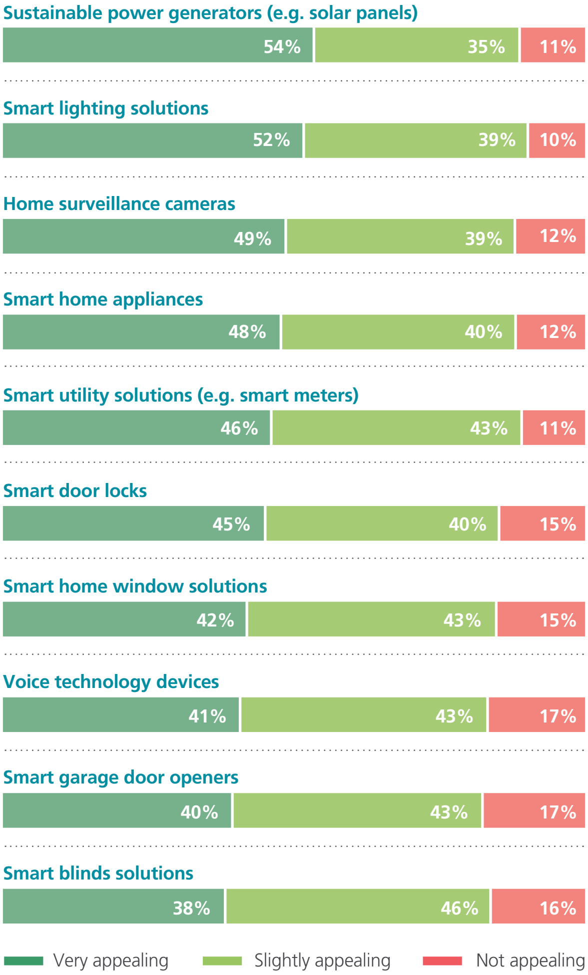
Q: What kind of impact do you think virtual and augmented reality viewings would have on your renting decisions? (Renters)



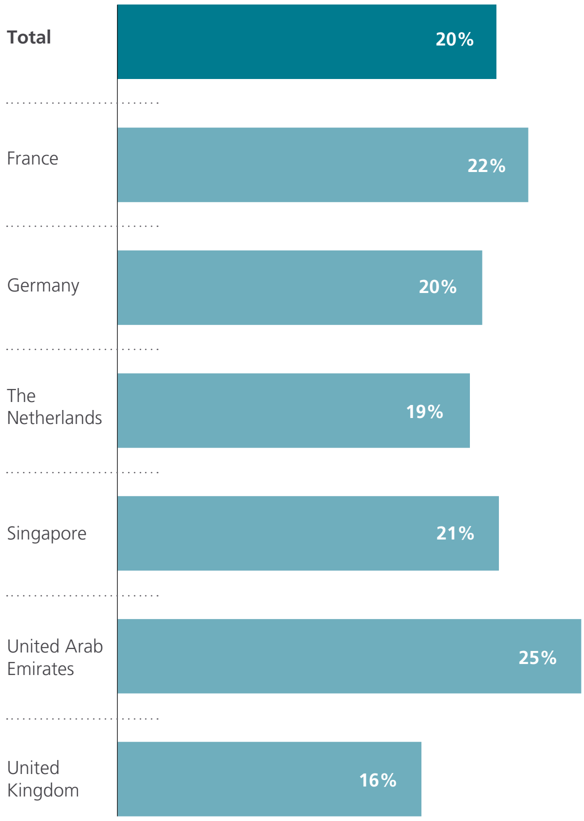
Our 2019 report, Urban Being, highlighted the rise of the 'beds sector' and its impact on the future of our cities. Back then only 47% of real estate professionals found residential an appealing asset class and only 58% favoured PRS, compared to a striking 70% and 74% respectively this year.

View the report here.

Q: How appealing are the following smart building technologies to you? (Renters)



Q: Assuming they were provided by the landlord, how much more in rent would you theoretically be willing to pay for these smart building technologies? (Renters)



There is an increasing view among leading build to rent owners like Get Living and Greystar that customers will develop a growing awareness of the best operators based on the quality of their service as well as the location and the asset itself.

This will allow the best operators to command a quality premium based on their track record and ratings on customer service websites, while less sophisticated operators unable to invest in tech will command lower rents and even critical reviews.

For both rental customers and the real estate sector, technology in the form of superfast broadband and electric vehicle charging points topped the list of most sought-after features in build to rent environments in our 2019 report Urban Being. Quality of service and technology remain intrinsically linked in this sector in our research this time around too.

View the report here.

"Technology has really come into its own in the last 12 to 18 months as we have seen a real increase in momentum as the evolution of the project moves from the initial physical infrastructure to the digitalisation which surrounds and connects the physical space to its uses."

Jason Margrave, Executive Director – Development, Quintain

PATRIZIA

Alexander Betz
Chief Digitalisation Officer

Please tell us about PATRIZIA

PATRIZIA AG is a leading partner for global real assets with more than EUR 47bn assets under management. The company was founded in 1984 and has currently has 24 offices globally with more than 800 employees.

Digital solutions and innovations are key to our strategy and we believe that introducing the very latest technology is crucial in ensuring we remain relevant.

Q: What is your role at PATRIZIA?

A: I am spearheading a five-year programme of digitalisation across the group, which is helping people to adopt more modern ways of working through a more agile approach.

We have centralised all our projects and the whole technical element across the company is now harmonised.

To sum up, together with my team, we run all operations to power our one-stop-service platform – our 'Engine Room'.

Q: How is PATRIZIA organised digitally?

A: Our Engine Room is at the heart of PATRIZIA. This is a system that is divided into Fund Services, Asset Services and Portfolio Services which is at the centre of our organisation.

Fund Services covers end-to-end administration of our funds, special purpose vehicle management, real estate and purchase evaluation and accounting.

Asset Services covers asset reporting, budgeting and onboarding.

Portfolio Services covers investor reporting, fund planning and portfolio analysis.

Q: What are the benefits of this approach?

A: The Engine Room allows us to interface successfully with our property managers and other partners, but above all it is there to benefit our customers.

For example, PATRIZIA customers receive best-in-class reporting: during the lockdown we did the first digital annual meeting of our retail funds.

Our investor portal 'myPATRIZIA' is very popular: our investors really appreciate us reporting in the most efficient way, through an automated interface. Reducing manual work has been crucial for our colleagues.

Next, we want to add more information and analysis on our ESG performance.

Q: How has COVID-19 affected your digital operations?

A: We were ready to work remotely overnight and supported people in a generic way. We had introduced an online collaboration tool which meant that colleagues could all work together effectively and immediately.

Q: What is the future for real estate digitally?

A: Real estate is really not in a good place regarding digitalisation. Processes are not clear and, overall, the sector needs to get more digitalised and more automated.

We will see a complete change in the next 10 years, with more seamless data and data-driven workflows and more standardisation.

We won't see advisers sending bespoke documents, for example.

We really feel challenged by getting this done. By better use of data you will see a whole improvement in the operation of properties and their ESG performance as well.

Eurotower Frankfurt

Quintain

Jason Margrave
Executive Director – Development

Can you please tell us about your role at Quintain?

I run the company's development team, which is responsible for the physical transformation of Wembley Park, an 85-acre mixed-use development on the land surrounding the national stadium. We have outline planning consent for 10.3 million sq ft of space, predominantly residential, where we have delivered circa 4,700 of a planned 8,500 units. There is also about 1 million sq ft of commercial office and half a million sq ft of retail and leisure amenities. We are halfway through completing the development and are already attracting over 17 million people a year to Wembley Park, which is more visitors than Covent Garden tube station per annum.

My team's remit at Wembley Park is very broad, and includes placemaking, design, planning, development viability, commercial leasing and the delivery of and interface with our Build to Rent product for Quintain Living. Outside Wembley Park, I am responsible for new business origination and acquisition.

Q: How has digital technology influenced the ongoing development of Wembley Park?

A: Technology has really come into its own in the last 12 to 18 months as we have seen a real increase in momentum as the evolution of the project moves from the initial physical infrastructure to the digitalisation which surrounds and connects the physical space to its uses. This ecosystem is benefiting us from an operational and data-driven information perspective, while also enhancing the overall customer experience through convenience and quality of amenities and service.

In 2020 we appointed our first chief technology officer to bring together our ambitious building information, modelling and data capabilities and Quintain Living's digital marketing, leasing and customer engagement platform, all underpinned by our integrated fibre network.

Q: Can you provide an example which brings this to life?

A: In recent months we have implemented a Quintain Living App which, born out of residents' feedback, gives them simple access direct from their smartphone to information and booking capabilities for retail and leisure amenities, visitor parking, events and activities across the campus, and offers and promotions. It also empowers residents to form their own social communities, such as dog-walking groups and sports clubs. To motivate consistent engagement and long-term engagement with the app, we have embarked on a gamification approach with our customers, such as offering prizes such as tickets for events at The SSE Arena, Wembley and discount vouchers for the most eco-conscious residents using the least energy. These initiatives have been very well received.

We work closely with our residents, using their feedback to learn and continually improve our operations – good technology should be win-win for both parties. For example, providing residents with digital, contactless entry to their building is efficient, safe and secure for them, while enabling us to capture a lot of helpful real-time data by measuring utilisation of communal spaces at different times of the day.

Q: Over the course of the last 18 months and the pandemic, how has technology helped your commercial operations?

A: Lockdown prevented in-person viewings, so we were able to bring our apartments and living experience direct to the phone, tablet or laptop of prospective tenants by creating a unique virtual tour. The technology and platform behind this capability was already in place.

ROBINSON Lobby

We had invested in a digital model of Wembley Park and together with our leasing system we were able to offer prospective residents a fantastic and successful alternative to an in-person tour.

Through our website, viewers could submit their criteria for accommodation before receiving a tailored three-dimensional tour of rooms on offer, and all shared and amenity space of interest. Interest could be registered online, with the subsequent documentation process managed digitally, allowing residents to view, complete contracts and move in without visiting first. While the traditional in-person viewings returned when coming out of lockdown, this digital service remains popular for those people living far away for whom an initial remote viewing is more practical and time-efficient. It also supports in-person viewings by allowing the Quintain Living team to show our nine developments across site digitally, from within the leasing office, before prospective residents shortlist the apartments they want to see.

Q: Which advances in digital technology are set to make the biggest impact on real estate over the next 10 years?

A: While building information modelling (BIM) has been around for a while, we are only just starting to see it being used to its full potential. At Quintain, we are a vertically integrated developer and have been designing in BIM for several years. This has benefits across the whole business, from design and development through to operational efficiencies. For example, we are currently developing a digital twin of Wembley Park both above and below ground. This will enable us to make informed, real-time decisions and factor in the long-term operational and maintenance life cycle costs at a decision stage, including the embodied carbon content.

Secondly, the influence of generative design will grow significantly. Software with algorithms can be used very effectively when programmed with the key parameters such as planning and daylight. Without initially needing to engage with an architect, several iterative options can be assessed based on weighted criteria. We have already run a trial at Wembley Park using this process – it is a phenomenally clever tool which is going to become more sophisticated as it evolves and could have a big impact on our industry.

IMMO

Samantha Kempe
Co-Founder and Chief Investment Officer

Please tell us about your business

IMMO is a tech-driven investment manager, which sources, leases and manages single family residential homes with the aim of unlocking this part of the residential sector for institutional investors.

While build-to-rent apartments have grown rapidly as an investment class, single family residential is 98% of the sector but has not so far been structured to appeal to institutions.

We offer homeowners the opportunity to sell their homes to IMMO, then we refurbish, improve and lease these properties to new tenants, on behalf of institutions looking to build stable single-family rental portfolios.

Q: How important is technology and innovation to the future of your company?

A: Technology is at the heart and in the DNA of our business – every person within the company operates with a data-first mindset. This is what differentiates us versus other real estate companies.

This differentiation is key to solving the many problems that exist all along the residential value chain. We have taken apart and put back together every single stage of the value chain in a smarter way.

Many of these pain points are consumer related. For example, selling or renting a home is among the biggest transaction anyone will undertake, but it still shocks us that you can pay GBP 3 for a coffee and get a better and more consistent product and service compared to when renting your home, which your largest and most important expense every month.

The certainty and professionalism we provide to sellers is important to them, and renters get a great quality, newly-refurbished home. Our customer support team and our contractual processes are all dedicated to providing a seamless, digital and efficient service to consumers.

Q: How does technology help with the running of IMMO itself?

A: To begin with, our underwriting process has been transformed. Traditionally an investment manager would build an Excel model, spending days or weeks trying to gather information from different experts but we have automated that process.

We have also changed the way comparables are selected for analysis of a transaction through machine learning tools.

But these aren't `black box' automated valuation models where you don't know how you have come up with a number: the outputs, cash flows and sensitivity analysis are all calculated and reported in a fully auditable, transparent manner.

It would normally take an investment manager several days to underwrite an investment from scratch: we can do that in 45 minutes since 95% of the process which is data gathering, copying and pasting into the model, creating the investment recommendation, etc. has been automated.

Technology is also important to us in creating a seamless flow of information: typically, people pass spread sheets down the value chain – and you then have extremely smart people wasting much of their time simply reconciling those spreadsheets.

We have devised a system that automates many workflows, enabling clean, efficient data to be accessed and used at every step of the value chain: a data-first mindset is key to our business.

Q: How will technology help as IMMO grows?

A: We have been in business for four years, developing technology across our value chain. 80% of our technology acts as a blueprint that can be transferred across to new international markets and everything we do has been built with scaling up in mind.

The world's biggest investors are under pressure to satisfy demand for residential property and until now single family residential has been inaccessible to them.

The market intelligence and analytics we have been able to provide to investors on this huge but new institutional sector has blown them away. The transparency on offer allows them to drill down into each asset as they want to, and can access very granular detail.

Q: How does real estate's take-up of technology compare with other sectors?

A: It's very promising that there is a huge intent to digitalise the real estate sector generally, but so many companies are wrestling with how to incorporate technology in two ways.

First, the IT infrastructure is missing, and it will be massive for them to try to change or rebuild

Second, companies are appointing Chief Technology Officers or Heads of Digital Innovation, but they alone cannot transform a business. It needs a real change of mindset across an entire organisation to fully embrace and adopt technology to the level required, and not every real estate company is ready for that.

Ideally, every single employee will be challenging themselves to think how technology and data can not only improve processes, but also empower them to make smarter decisions.

Q: How has COVID-19 changed the influence of technology in real estate?

A: COVID has massively accelerated the process. Before the pandemic, people were hesitant in understanding what technology could do, but adoption in the last year has been fantastic.

This has forced people to realise the world is changing, and for real estate it has been a big wake-up call, making them more open-minded on what technology can do and should do. Hopefully, many people will also go several steps further and challenge themselves and their companies to consider how they can better incorporate technology.

A new divide for offices

Technology and an innovative approach to sustainability and wellbeing are set to secure the future of the office. In a world where the office now has to compete with the comfort of working from home, it needs to find a new purpose to persuade people to return to the commute, at least some of the time.

Rethinking Real Estate by Dror Poleg, co-chair of the Urban Land Institute's Technology and Innovation Council, was a book narrowly ahead of its time.

Published just before the pandemic, and quickly the talk of the London and New York real estate scenes, Poleg's book predicted the rise of technology and increased flexible working in the weeks before they became global phenomena.

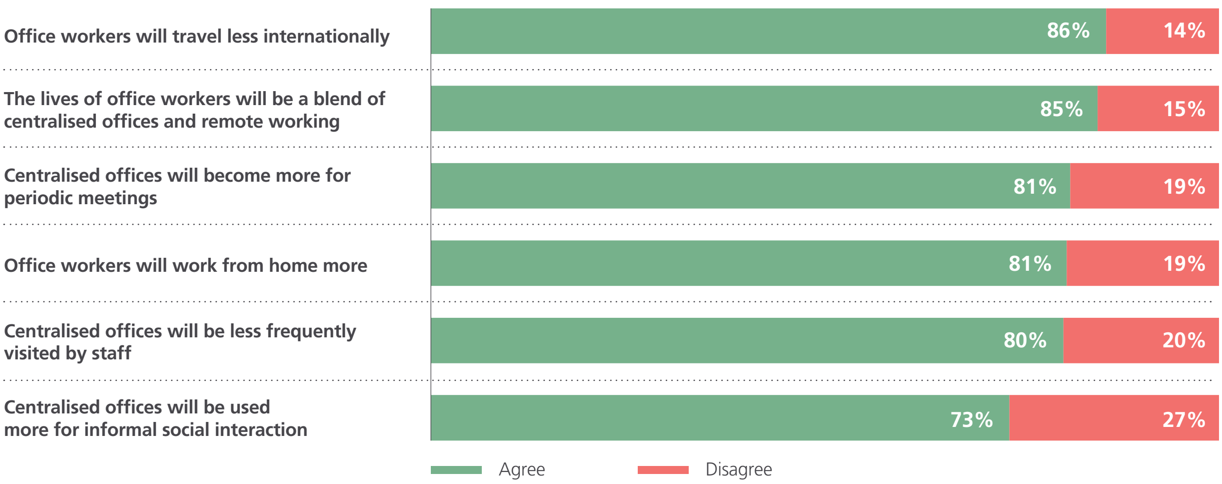
Fast forward 12 months and premium, new-build office buildings that offer high-tech, experiential spaces, with a focus on collaboration and interaction, are proving popular, while a more challenging future is predicted for the older space.

The 1,500 office occupiers we polled around the world agreed in overwhelming numbers that the changes brought about during the pandemic are here to stay.

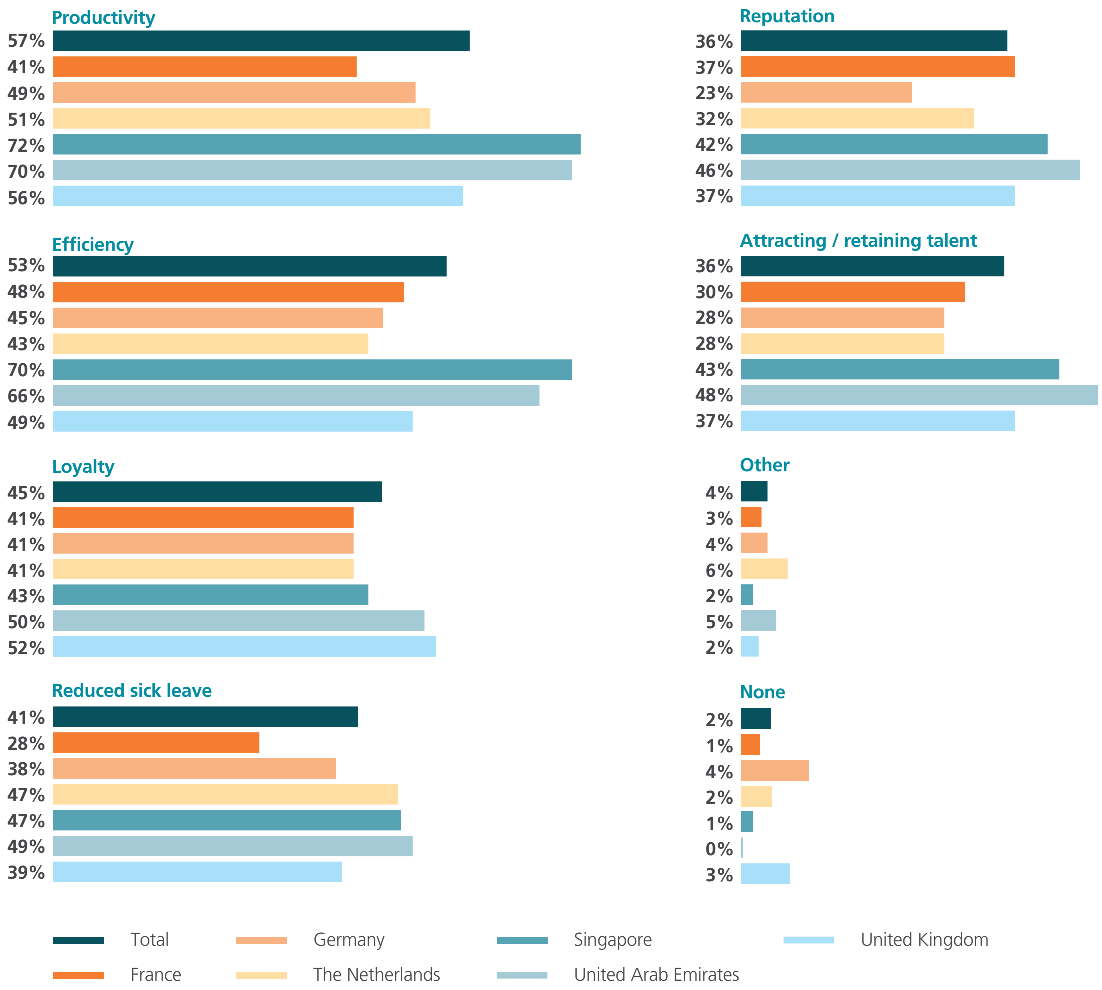
In our Real Estate Reset report published in September 2020, 42% of office occupiers said they would work from home more. This has rocketed to 81% this year.

Likewise the importance of sustainability has resulted in a stark change in perceptions of business travel. Last year 34% of office occupiers expected office workers to do less international travelling. This figure is now 86%.

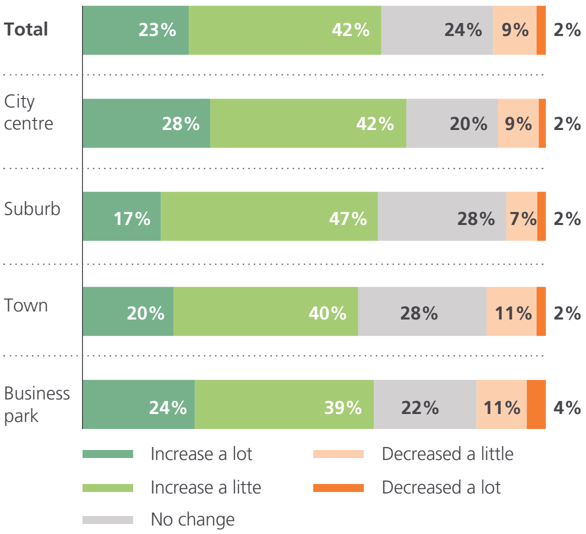
Q: How strongly do you agree or disagree with the following statements about how working life will change over the next five years? (Office occupiers)



Q: What positive impact does a focus on employee wellbeing in the office environment have? (Office occupiers)



Q: As a result of COVID-19, how do you expect the allocation of space per person to change in your office? (Office occupiers)



While people may only work from an office two or three days a week, the reassuring news for owners and developers is that the occupiers we polled foresee an increase in the space needed per person, potentially balancing out the reduced number of people working in an office. Prompted by wellbeing concerns and a desire to generate a more comfortable and collaborative working environment, this reverses a trend over recent years for office densification.

Almost three-quarters of those we polled whose offices are in city centre properties expect their office space per person to increase, with people having spent time working from home reflecting on ever-reduced space allocations during the 2000s and 2010s.

Recent JLL research identifies that 22% of office workers feel less productive at home compared with 37% who feel more productive than in the office and 42% who saw no difference.

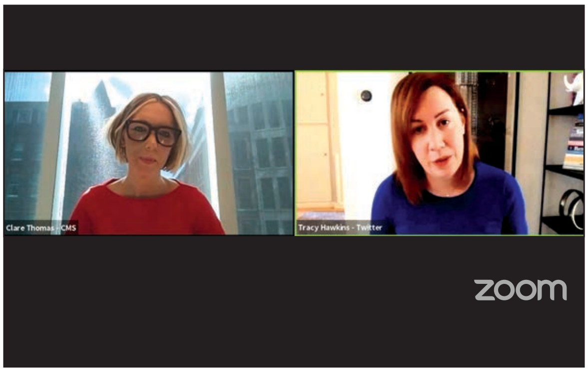
Yearning for a return to the office grows

People miss the office, the human interaction it promotes and the clear boundaries that office life creates between personal and professional life.

In many organisations, it has been younger people who have lobbied hardest for a return to the office, unable to work satisfactorily at home and missing the opportunities and social interaction that office life presents.

As city centres begin to work out a new future, technology will be at the heart of the debate, with the more favourable buildings allowing people to work seamlessly and connect with colleagues around the world at the same time as giving a feeling of safety and security.

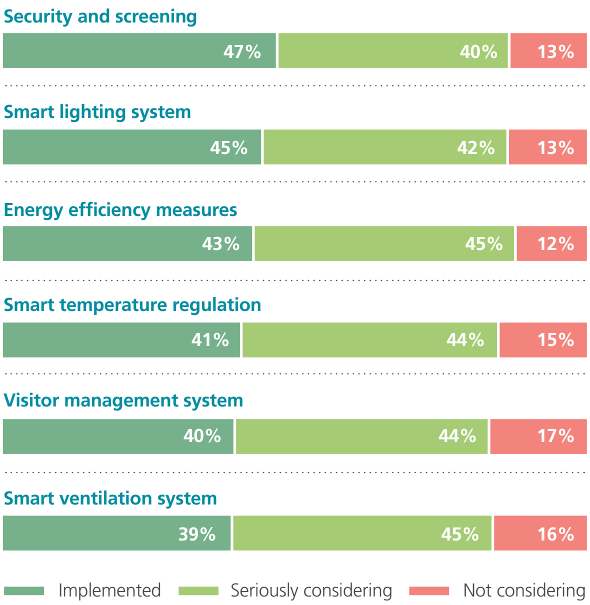
With 'the digital workplace' now considered the new working environment, employers need to both embed the physical implementation of smart technology in their buildings and to ensure the virtual working experience transforms the employee experience by fostering efficiency, innovation and the social elements that many people crave in their workplace.



Clare Thomas, Real Estate Partner at CMS, interviews Tracy Hawkins, Vice President of Real Estate and Workplace Remote Experience at Twitter. This is a fascinating insight into Twitter's approach to the new world of work recorded as part of a Fireside chat for Bisnow.

Watch the video here.

Q: Which of the following 'smart building technologies' have already been implemented, or are currently seriously being considered in your office building in the next 12 months? (Office occupiers)



It is interesting to note that in Germany, United Arab Emirates, the UK and Singapore our polling showed that an office which enhances wellbeing is considered to improve efficiency and productivity.

We should not underestimate the importance of the best new office buildings in acting as magnets for talent, which was also recognised by many of those we polled.

Union Investment

Thomas Müller
Head of Digital Transformation

Can you please tell us about Union Investment?

As a German-based business, we have a long-standing presence in the real estate market, managing investments for institutional and private investors via a wide range of funds. We currently manage a worldwide portfolio of over 400 properties across multiple sectors, comprising around EUR 50 bn of assets under management.

Q: What is your role in the company?

A: As Head of Digital Transformation, my role is twofold. Firstly, alongside the CEO, I am responsible for the overall strategy and development of the company, and secondly, I work with the COO to ensure the implementation of the strategy. The team I lead is comparable to a corporate management department, where the digitalisation of operations is integrated with all areas of the business including sustainability, process and control management, so all topics, trends and issues influencing the development of the business come across my desk.

Q: So digitalisation is intrinsic to both the operational business and strategic development of the company?

A: Absolutely. We embraced digitalisation in 2016 when we realised the impact digital technologies were set to have on real estate, and our sector as whole was being slow to react compared to other industries. Our approach to digitalisation is two-dimensional.

Primarily we focus on our internal processes and how we manage and analyse our systems data by transferring from a manual to automated process to gain more cost efficiencies. We then look at how we can best adapt this technology to create new business models and develop digital ecosystems in and around our buildings, putting the user at the centre. We then work in partnership with our tenants to develop the best, most attractive features and services to solve their problems and ensure they achieve maximum benefits from the building.

Q: What are the most important issues or challenges for tenants which digital technology can help solve?

A: It varies, but I think there are three common themes, all of which have become more topical with the increasing trend of hybrid working and hot-desking in the post-COVID world. Availability and cost of car parking, particularly in central locations, is an important topic, with the huge variety in levels of demand from busy periods to quieter times for both staff and external visitors.

This forms part of wider mobility concepts, such as how tenants and visitors move around locations, which is an increasingly significant issue. In turn, mobility is an important component of the second theme, which is sustainability – for example, how we integrate power-charging facilities in the parking space.

Thirdly, we focus on how to support the tenant and user by maximising the convenience factor. With integrated digitalised platforms, workplace management can be individualised and energy-efficient – for example, in heating, cooling or carbon dioxide concentrations.

For all three there are a number of processes to help, but ultimately users are able to access a mobile app via their smartphone which enables them to check availability, view options and make reservations in advance of coming to the office.

Q: What impact has COVID-19 had on the pace of change and adaptation of digital technology?

A: The pandemic has certainly sped up the adoption of digitalisation as the 'new normal' and companies without a multichannel digital business model have struggled and are at a huge disadvantage. Those with platforms in place have been much better equipped to survive and thrive, are more connected and can cope with the new virtual, remote way of working as common practice.

I think the pandemic has accelerated change we would have seen by several years.

"Granite Park VII" in Plano, USA

Q: What are the barriers or challenges facing the widespread successful adoption of digital technology?

A: With so many partners throughout the real estate cycle, the industry is very fragmented. Therefore, it is vital for the industry collectively to have a mindset of cooperation, interaction and collaboration. Secondly, the industry sometimes does not have the courage or the vision to try new things and experiment. Other industries, such as IT, do this so much better, working on new, vibrant products with their customers. Finally, and most importantly, we have to learn to take people with us on the journey, think about their needs, allaying fears and inspiring confidence and understanding.

Q: What are the main overall benefits digital technology is bringing to Union Investment?

A: While cost savings and the acceleration of innovative processes are helping us to operate faster and more efficiently, it is the overall increase in quality, and consistency of this quality, which digitalisation provides over manual processes.

AXA IM Alts

Vincent Mezard
Global Head of Hospitality and Operated Real Estate

Can you please tell us about your role?

I am responsible for our hotel portfolio and operated real estate which incorporates around EUR 3.5bn AUM of managed and leased properties, including offices across Europe, the US and APAC. I spend a lot of time trying, testing and adopting technologies and services to make our portfolio as useful and efficient as possible, particularly across our trophy office assets.

Q: What is your overall approach to adopting new technologies in your office assets?

A: It is a balance between being at the forefront of technology and the services we are providing our occupiers – for example, access access control and mobile apps – but at the same time the technology needs to be mature enough to be rolled out across the portfolio on a large scale. For example, at our flagship assets such as 22 Bishopsgate in London and Stories in Paris we committed to significant investment in a digital twin and the most advanced building operating systems. Across the rest of the portfolio we focus on simpler, more scalable technologies. A good example is embracing IoT and the digital connectivity of all our assets, such as automating data collection, which helps improve a building's efficiency and sustainability.

Q: How do you see the relationship between technology and ESG?

A: We see technology and ESG as being two sides of the same coin. Technology has a big role to play in tackling ESG commitment and helping reach targets and goals. The most obvious example is the monitoring and measurement of energy consumption to improve the carbon footprint of buildings. Regular and careful measurement of usage and engaging with facilities and property managers and, importantly, the tenants, increases understanding and drives everyone's behavioural change.

Q: How is this working in practice at 22 Bishopsgate, for example?

A: All the technology and systems of the building operate over a converged network and are connected to a self-learning fault detection and diagnosis system. This collects and analyses over one million data points per day on temperature, air, light, water and the flow of people with the aim of increasing energy efficiency, lowering operational costs and simplifying repairs.

These innovations will be fundamental to the operational team in delivering the commitments that have been set to ensure that 22 Bishopsgate remains at the forefront of successful productive spaces. These commitments cover health, learning, inclusion and sustainability and are already being delivered: for instance, the energy for the building has been procured from 100% renewable sources.

Q: Do you think that historically real estate has not been as quick or agile in adapting to new technologies as other industries?

A: Yes, and I think an illustration of this is the French word for real estate 'immobilier', for which the literal translation is 'it does not move'! However, with so much new and exciting technology emerging for industry to embrace, there is a real opportunity to transform the way real estate is managed, moving from the old information silo systems to cloud-based and IoT technology which is making life much simpler. The pandemic has been a further catalyst for innovation, accelerating the way we think and behave. COVID has put pressure on real estate, forcing landlords and occupiers to consider reducing their footprint and improving quality and services, and the shift towards more mobile working where technology has a major role to play.

Q: What are the most prevalent issues for the office which technology can help solve?

A: I think the first is better indoor connectivity. Understandably, tenants have increasingly high expectations for the best and most reliable internet connection, which is fundamental to their business.

22 Bishopsgate, London

It still surprises me how so many people still struggle with wi-fi connectivity in the office and yet enjoy a much better, more reliable experience working from home. This must and will improve – reliable indoor connectivity is a fundamental game-changer and will be the foundation of the office in 2030.

The second is automated data collection, which is absolutely essential to tackle ESG commitments. Accurate and efficient monitoring of buildings and how they are being used and interacted with is very important as the starting point for reducing energy consumption and driving down carbon.

Finally, how tenants access and interact with the building. In the future, the office worker will want a smooth, more streamlined journey through the office through their smartphone – which will replace keys, cash, and ID cards and remove unwanted friction from their daily routine.

Methodology

Survey methodology

1.	**Industry professionals** (online polling conducted 21 April to 28 May)	N = 209 real estate industry professionals participating
2.	**Office occupiers** (online polling conducted 22 April to 26 April)	N = 1,500 completing, who are managers with decision-making power in regards to real estate, working in a company that had a physical office space before COVID-19, 250 in each: Germany, France, The Netherlands, Singapore, United Arab Emirates, and the UK.
3.	**Renters** (online polling conducted 22 April to 23 April)	N = 1,500 completing, who are adults who currently live or would consider living in a rental property, 250 in each: Germany, France, The Netherlands, Singapore, United Arab Emirates and the UK.
4.	**Retail decision-makers** (online polling conducted 22 April to 4 May)	N = 600 completing, who are retailers with decision-making power in regards to real estate, 100 in each: Germany, France, The Netherlands, Singapore, United Arab Emirates and the UK.
5.	**Life science professionals** (online polling conducted 20 April to 21 April)	N = 250 completing, who are global life science professionals

For more information please email dan.healy@fticonsulting.com.

Note: As a consequence of rounding percentage results, the answers to some questions do not equal 100%.

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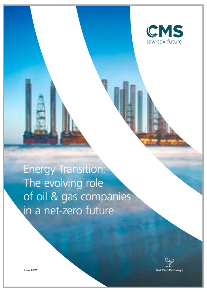

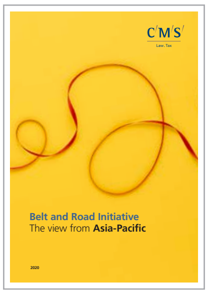

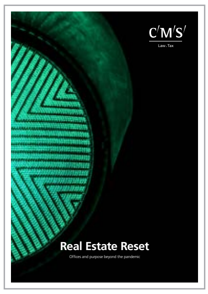

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