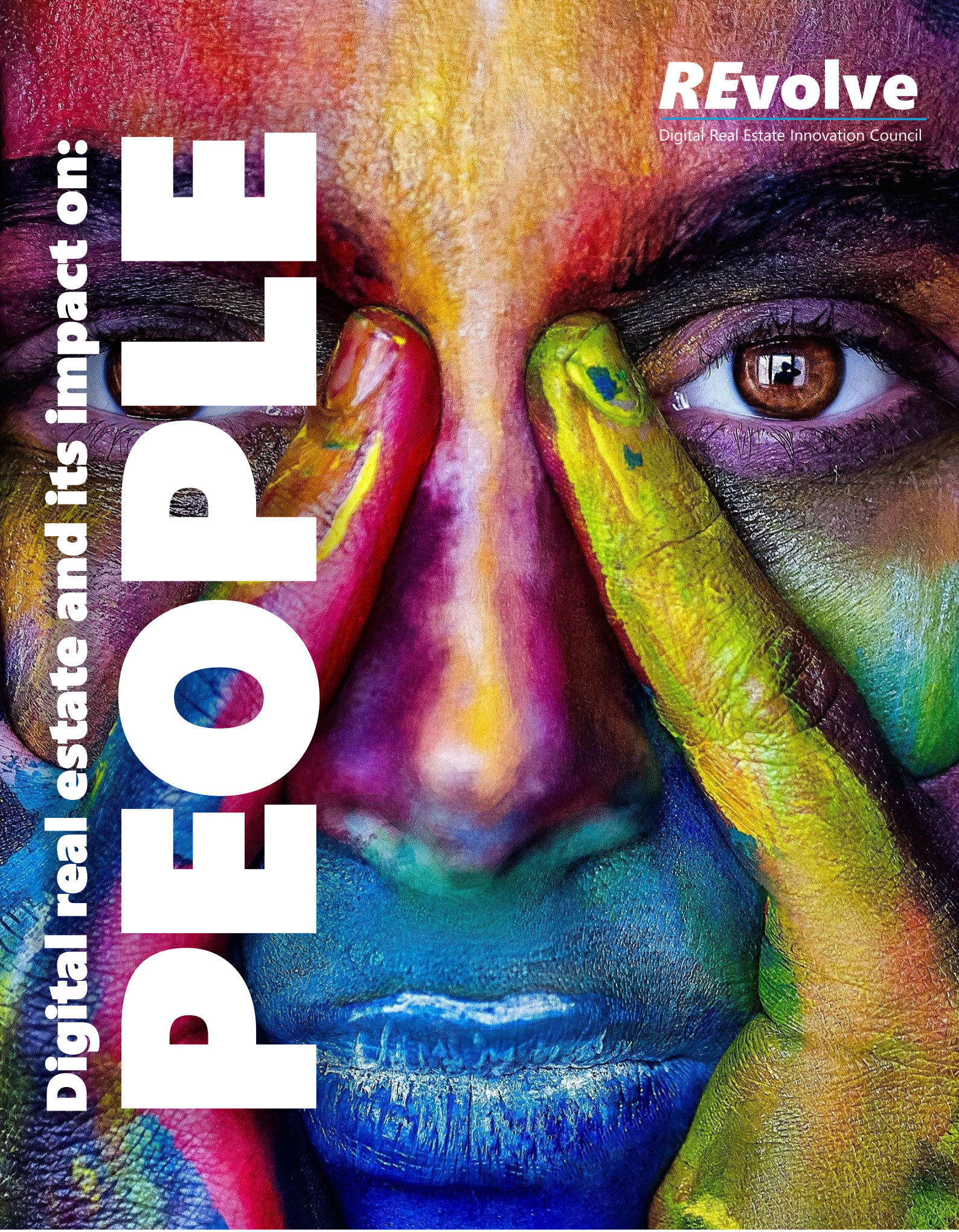
REvolve

Digital Real Estate Innovation Council

Digital real estate and its impact on:

PEOPLE



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People have always been part of property decisions. If we look at offices, shops, or homes, they all involve people. But now the influence that buildings have on people is fast rising to the top of the agenda and technology is helping this to happen.

As buildings evolve from dumb concrete blocks to the digital platforms of tomorrow, the adoption of technology within them is growing exponentially. It is creeping into every facet of a building, from smart speakers to building sensors and everything in between.

Technology is not just allowing landlords and occupiers to better run and use buildings, but also to inform the decision-making process. The coming years will see a surge of people related data which will influence decisions affecting anything from property valuation to building design to letting negotiations.

Since the Covid 19 pandemic, employers are more aware of the role of a building in attracting and retaining their staff. Employees and customers have also become more transient. They want to spend their time in a pleasant, healthy environment and if they are unhappy with the building they are in, they are more likely to leave. At the same time as this change in attitudes, individuals also have better access to data to help inform their decision making.

There is also a growing body of evidence that suggests that buildings can have a measurable impact on the people using them. For example, the quality of air within an office can have a significant impact on employees' health and in turn productivity. To use just one example, ***a World Green Building Council report into health, wellbeing and productivity in offices, includes research that links improved ventilation with up to 11% gains in productivity***.[1]

This paper explores how technology can help measure and support the impact that buildings and the built environment have on people and wider society. It considers the topic from three different perspectives; people, data and the overall sector where we explore the challenges and opportunities and the potential next steps for the sector to move forward.

*(Fellowes Workplace Wellness Trend Report)

[1] Health, Wellbeing & Productivity in Offices: The next Chapter for Green Buildings, World Green Building Council, 2014

SECTION 1: BUILDINGS AND THEIR IMPACT ON PEOPLE

Health and wellbeing

A building has a significant impact on a person's wellbeing. Their health and happiness can be directly attributed to the environment that they are in. Something as simple as access to natural lighting can have a profound effect on a person's wellbeing – ***one study by neuroscientists found that office workers with windows sleep an average of 46 minutes more each night[2].***

Wellbeing is now considered an essential part of an employee's benefits package. Businesses are investing heavily to make sure their staff are happy and healthy at work, with the office environment playing an important role in achieving this. Employees themselves are also becoming more informed on the topic. For example, the growth of smart watches has allowed individuals to better understand their own wellbeing, whilst some employees are using their own air quality sensors to monitor the health of their workspace.

Advances in technology have allowed building owners to more rapidly and robustly measure and improve the performance of a building for its users in terms of improved air quality, better lighting and more flexibility. Building sensors detect and regulate temperature, humidity, lights, appliances, and air quality. In addition, IoT sensors can monitor motion, proximity, contact, water quality, electricity, and security, allowing them to automate systems and provide valuable data. All of which can be used to improve the user experience and health. Since the Covid 19 pandemic, people are paying more attention to the air quality of the buildings they use, and the impact the building has on their own health and wellbeing. The use of building sensors is still mixed across the property sector but they are becoming more widespread and will become a valuable tool for owners and managers to compare the performance of their buildings.

In summary – since the Covid 19 pandemic, people are more interested in how a building can impact their health and wellbeing and technology is increasingly being used to help monitor this impact.

Mental Health Burden

Technology may be helping owners and occupiers to improve and measure the wellbeing of their staff and customers. But one area that is often overlooked is the negative impact of technology on the user. For all the benefits it can deliver, the property industry must also consider how building users engage with this technology and for how long. As buildings become ever more digitally advanced, the potential negative health implications should also be recognised, such as the impact on eye health and mental health.

Employees often spend their day on multiple digital platforms, both from a work and social perspective. Back-to-back video calls throughout the day are now common. ***According to Microsoft, the number of meetings per week has increased by 153% globally for the average Microsoft Teams user since the start of the Covid 19 pandemic.[3]*** Staff do not need to walk to meeting rooms to engage with colleagues or

[2] Impact of workplace daylight exposure on sleep, physical activity, and quality of life. American Academy of Sleep Medicine 36 (Chueng I,2013)

[3] Microsoft Work Trend Index 2022, Great Expectations: Making hybrid work *work* (March 2022)

travel to client meetings which used to provide valuable off-screen time. In smart buildings, employees might also use mobile apps to access the office or book a meeting room and engage with building sensors which monitor their activity and comfort levels. But where do employers draw the line? Could staff reach a tipping point of technology saturation where productivity levels fall due to the increased burden on mental health from the use of so much technology?

Since Covid 19, many employees have chosen to work from home. Employers have a duty to look after their staff, but this may be difficult when managers can't physically see employees, notice how late they are working or assess their stress levels. If you take remote working and the increased exposure to constant technology, then could there be a potential mental health timebomb quietly ticking away? This may potentially lead to an increase in legal claims against employers for not doing enough to limit the pressures of an individual's job role.

There is no doubt that owners and occupiers must strike a delicate balance in terms of using technology to help and not hinder wellbeing.

In summary – the increased use of technology can bring benefits in terms of improved wellbeing, but it can also have a negative impact on users, in particular on mental health.

A blended approach in a hybrid world

The role of a building has changed as we move towards a new hybrid world. People are using buildings differently, no longer working, shopping or relaxing in set locations, but instead wherever it is convenient or offers the best user experience for them at that moment in time.

In the retail sector, brands cannot operate a physical store in isolation from a separately managed website. The physical and virtual retailer has been forced to work in harmony, allowing consumers to visit a shop and later order online, or to order online and collect in store.

Similarly, the role of the office has changed with the impact of Covid 19 accelerating the pace of that change. ***According to a 2021 survey into hybrid working, 83% said that at least 25% of their workforce will be working in a hybrid model post pandemic and 42% said half or more of their workforce will be hybrid.***[4]

The office is no longer just about providing a physical space to work. It needs to play a 'Mothership' role for a hybrid workforce based in multiple locations. It still needs to provide a place for people to meet and collaborate face to face, but it also needs to connect with the wider, virtual team. The big challenge for employers is providing the technology to facilitate this new way of working.

In summary – as the world becomes more flexible and fluid the role of a building will evolve to not just being a place to carry out tasks, but to act as a 'Mothership' for a wider ecosystem.

Hardware investment

As the workforce becomes more flexible, employers will need to consider the hardware implications. They need to assess what technology is required to make staff efficient both in the office and from remote locations. Whilst technology can be a key facilitator of remote working with the adoption of Microsoft Teams and Zoom throughout Covid 19, few have adapted offices to suit the needs of a truly hybrid workforce.

[4] Hybrid Work Global Survey 2021, Riverbed/Aternity

Many corporate occupiers have been reviewing how they use technology and meeting spaces in response to new workforce trends and ways of working. Indeed, workplace strategies have become ever more critical in driving innovation and operational efficiencies, as well as attracting and retaining the best talent.

Developing the office for the future isn't something that is achieved overnight, and most organisations we speak to continue to be testing and learning. For example, KPMG dedicated a floor in our Canary Wharf office this summer to run a three-month pilot for staff to test different workspaces, layouts, furniture and technology.

There is increased focus on how office space can facilitate innovation, ideation and collaboration, as well as much greater emphasis on the different needs of employees and teams – whether that's adjustable desks, quiet zones for those who need to focus away from open plan spaces, or an awareness of the different expectations and user experiences of the five different generations we often now have in the workplace.

One of the biggest challenges is in creating spaces that have the flexibility to accommodate a truly hybrid working world. Where in-person and virtual attendees can have the same user experience of meetings and there is a seamless (and secure) transition between the two. We also need to recognise the wellbeing implications of the expectation that employees can be constantly available in both the physical and virtual worlds, and ensure that workspaces support organisations to manage this.

Technology is also important for maintaining connectivity across the organisation, particularly with teams now often in the office on different days and different floors. For example, KPMG has invested in an app that staff use to book space to help them search for colleagues' bookings. It also enables more efficient use of space by providing more accurate visibility of availability and allowing for the increasingly mobile way in which employees now use office spaces.

As with elsewhere in the industry, data-driven insights are critical to improving the user experience of buildings. There is clearly a fine ethical balance here in respecting the privacy of employees, and there is a risk that rather than moving away from in-person presenteeism we simply add virtual presenteeism to the mix, but by understanding how buildings are used and the complex web of micro-events, interactions and touchpoints that impact the employee experience, we can use office spaces to better support wellbeing and productivity.

For a meeting to work effectively with people in the office and people based remotely, offices require the appropriate hardware to ensure that everyone is involved and able to interact seamlessly. Most employers will need to invest in an upgrade of their hardware to allow staff to effectively engage in this way. The technology exists, however the costs can be prohibitive. There is also often a debate over when to invest. Innovation is rapid; is it best to kit out the 'Mothership' with the latest technology now or hold off for the next upgraded version?

Providing a seamless technology approach for the future workforce is going to become increasingly challenging, even more so when the hardware is provided partly by the property owner, the employer and the employee themselves.

In summary – an investment in hardware will be required to enable most buildings to play a truly hybrid role in the future.

Productivity

Increasingly, there is a belief that buildings can influence the productivity of employees and that smart buildings can potentially increase that productivity. In one piece of research into smart offices, commissioned by British Land, respondents believed a smart office could improve productivity by 37%.[5]

With so many staff now working remotely the measurement of productivity has become more important. Employers want to track how productive their staff are when working away from the office. However, there is not one framework for measuring productivity that is generally accepted as the one to follow so employers use different approaches.

A recent survey by Microsoft found that hybrid working has created 'productivity paranoia' amongst employers with 85% of leaders saying that the shift to hybrid work has made it challenging to have confidence that employees are being productive.[6]

Many of them choose to use software applications which allow them to track the activity levels of their staff. Information can be gathered on the number of meetings attended, emails sent, time spent online and collaboration with contacts. But some question how useful simply tracking activity levels is for gauging productivity. Does knowing how long an employee has been logged on to their computer really indicate they are working or is this just measurement for measurement's sake?

It is possible that an embedded culture of 'presenteeism' is influencing this need for measurement and employers feel more comfortable when they can see staff at their desks until a certain time each night. This culture clashes with remote working and is an area that will need addressing by many firms.

In summary – productivity will become a key measure of building performance, however there are challenges around how to measure and improve it within a hybrid work environment.

[5] Creating Places People Prefer, British Land

[6] Microsoft Work Trend Index 2022, Hybrid work is just work, are we doing it wrong? (September 2022)

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Monitoring employees in the workplace is not new but the methods by which this is achieved, the workplace itself and the regulatory regimes are continually evolving. Social media also provides an effective platform for reputational damage when monitoring activity is regarded (rightly or wrongly) as illegitimate.

Monitoring may be driven by a variety of legitimate (and competing) concerns: employee wellbeing, improving productivity and space planning/building efficiency. This mix makes getting the balance right difficult. Employers are legally obliged to maintain a safe place of work; this includes an employee's home workplace when hybrid working arrangements are in place. Physical and mental health are in scope of this duty and technology can be an effective tool to meet this obligation. It is also legitimate to use office space usage monitoring tools to manage and reduce workplace costs as well as to optimise hybrid working arrangements.

The use of monitoring tools can also create significant issues, adversely impacting employee and trade union relations, harming physical and mental wellbeing and giving rise to potential discrimination and other employment claims and data protection breaches if not handled appropriately. Employees may feel personally targeted - there is anecdotal evidence that some have felt unable to take breaks which is important for eye and musculoskeletal health and required by some medical conditions (which may qualify as disabilities under the Equality Act 2010). A working environment that inhibits this could place an employer in breach of its health and safety obligations and could lead to constructive dismissal and/or discrimination claims.

A responsible employer will wish to ensure that (whether working at home or in the office) regular breaks are taken and that employees are not working excessive hours. Software monitoring can facilitate this, for example through push notifications reminding individuals to take breaks. However, the same tools and data can be used to provide notifications such as productivity improvement suggestions. Whilst employers can legitimately ensure that productivity levels are not sub-optimal (which is damaging for both business and individual mental health), if mishandled this too could give rise to psychosocial risks such as work-related anxiety or burnout, so the manner of implementation is key.

As workplace practices and technology evolve, so too will legislation and guidance. A revised ICO Employment Practices Code is imminent and will address employee monitoring. Any UK replacement to the GDPR will also inform the narrative.

Transparency

Transparency for building users is one area that needs improving. Building owners and managers capture data on people using their buildings, but this is rarely communicated to them. This seems to be a missed opportunity, particularly when sustainability and wellbeing are considered so important by so many. If there ever was a time to shout about a healthy, sustainable building, now would be it. For example, information about air quality or energy usage could be displayed in a building's reception or on the company website. This would allow users to compare the buildings they use and ultimately drive improvement in terms of how competing buildings perform for people.

In summary – increased communication about the performance of a building and its impact on people would be advantageous for both people and building owners alike.

> ***"Transparency is a key data protection principle which is fundamental to a 'data protection by design and by default' approach."[7]***
>
> ***- ICO***

* Source - https://www.britishland.com/news-insights/insights/creating-places-people-prefer

[7] https://ico.org.uk/for-organisations/accountability-framework/transparency/

The first step in connecting and engaging with occupiers is to recognise that there are two groups: those who manage the lease, 'strategic occupier contacts', and the 'end users'. Both groups have different wants, needs and expectations, and require different methods of communication. Therefore, the first step of communicating with each group is to establish appropriate and scalable distribution channels.

Strategic Occupier Contacts

Typically a member of the management team, this individual is primarily concerned with how the real estate contributes to their company's growth ambitions. These include commercial (service charge budgets), productivity (employee health and wellness) and value-based (sustainability) matters.

Due to asset manager time constraints, regular engagement with strategic occupier contacts is typically limited, aside from leasing events and bi-annual check-ins. This results in the need to rely on multiple intermediaries for feedback, which can limit engagement and opportunities to gather insight for asset and portfolio improvement. Furthermore, with unconnected systems in use, it can be difficult for strategic occupier contacts to navigate and understand how they are using their space. Therefore, a connected platform linking all of the above matters is key to seeking meaningful engagement where an occupier can feel informed (data insight (e.g., energy usage) and central document storage), raise requests and concerns (streamlined processes such as license to alter) and purchase goods and services that they would otherwise find inaccessible.

Building Users (End Users)

Traditionally in the asset management sector, building users, have been underserved. However, with the advent of new ways of working and flexible leasing models, it is vital that owners get closer to how their assets are enriching the lives of the end users, in terms of both productivity and quality of life.

Here, the medium of delivery, functionality, and content will differ significantly to the strategic occupier, as end users will directly compare this with other end consumer applications that directly compete for their attention.

As a result, a platform that can engage the building team and larger community while delivering seamless experiences is needed to maintain a connection to the building. This has typically taken the form of a mobile application in order to deliver capabilities like mobile access control and support a building community even while working from home. Furthermore, for the owner this link provides an opportunity to gather real-time feedback, and a common method to connect various buildings within a portfolio to curate synergies such as shared amenity.

As we move forward, these distribution channels will provide more direct feedback as well as a foundation for adding additional capabilities as owners seek to better understand the user journey and add value beyond space.

SECTION 2: DATA

When considering the digital innovation of buildings, data is a vital part of the discussion. It underpins everything. There are many factors that need to be considered from a data perspective for us to meet the needs of building users in the future.

Apples with apples

Data without context is of limited use. To be of any real value, we need to understand more about it, such as what exactly is being measured, when was it recorded, by whom and how. Only then can we really understand the context of the data to start gaining insights. If this is not the case, either insights cannot be attained, or even worse incorrect insights are identified.

A significant factor in comparing data sets, or apples with apples, are standards. Standards set out guidelines about what information is measured and how it is measured allowing data to be used effectively.

Measurement variations between markets caused by inconsistent measurement standards can be as high as[8]

24%

Sustainability data in buildings, for example, could mean data on energy performance, or operational carbon, or embodied carbon or flood risk. All important areas, but unless there is a clear way to articulate exactly what data is needed and why, then they are different perspectives on the same theme.

Another example is the measurement of productivity or happiness, which buildings of the future will become more focused on. The ability to measure this in a consistent way, guided by widely adopted standards, will be key in identifying the steps needed to make the building perform well.

In summary – data analysis can provide valuable insights into building performance, but without widely agreed and adopted standards, this can be problematic or worse, misleading.

Market-level data

In order to monitor and benchmark the performance of a building and its users over time, a baseline of data is needed. In a fragmented market such as property, individual people and companies are likely to have only a handful of data points so the need for market level data for use by the whole sector is essential. This type of data is already provided by companies like MSCI, BCIS or EG Radius in other areas, but the sector will have to take a far more collaborative approach to collecting and sharing data to provide a baseline about property performance and its impact on people from which to work.

8 https://fastedit.files.wordpress.com/2013/09/ipms-infographic.pdf

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With many workers returning to the office after an extended period of remote working, conversations surrounding the future of work are especially poignant. Calls for healthier workplaces are coming from the ground floor and the trading floor alike. How do we create a safe and healthy office environment? How can we continue to engage employees and support their productivity when returning to the office? Organizations that put the health of their customers and employees first are best equipped to meet demand for a high-performing workforce.

The question of measuring well-being can be a difficult one for organisations to answer.

Following a holistic evidence-based approach is imperative to tracking changes to well-being. Scientific research identifies key building-level interventions and organizational strategies across various categories as they relate to health, such as air filtration and water quality. As more organizations look at innovative ways to measure well-being across their portfolios, tracking both quantitative and qualitative feedback from their workforce should be seen as an important barometer.

Continuous monitoring of Indoor Environmental Quality (IEQ) indicators is a great way for organizations to track their performance across a broad spectrum of parameters related to well-being. The WELL Performance Rating, for example, requires sustained observation of IEQ's through environmental monitoring, which determines how a building is performing in real time by analyzing sensor or onsite testing data.

While technological advances can support efforts to more effectively monitor air and water quality, or determine the most optimal lighting and sound for a productive working environment – singular components to overall well-being – real shifts in perception can be tracked in tried and true occupancy data. A recent study published by Building and Environment analyzed the impact of a healthy building on occupant satisfaction and perceived health, well-being and productivity using more than 1,300 pre- and post-occupancy survey responses from six companies with WELL Certified buildings. The study found that these buildings increased the perception of well-being by more than 25 percent. This includes helping occupants feel more energized, more motivated to work, more confident that the workplace is conducive to health and an increased sense of pride in being a part of the organization. Findings also suggested a 30 percent improvement in overall occupant satisfaction with the workplace, a 10 percent increase in occupant perceived mental health and a 2 percent increase in physical health.

Air quality, energy performance, productivity and wellbeing are all areas that would benefit from a market level baseline of data. But how can this be measured? When a baseline of data doesn't exist, landlords or occupiers revert to the next best thing – what does 'good' look like? If a score of 'X' for air quality is considered good, then aiming for 'X' could become best practice and help achieve the desired operational outcomes. However, what good looks like still needs market level collaboration whether it is in sharing data or defining standards, or both.

The property sector will have to take an ever more collaborative approach to data sharing to be successful in understanding and improving how a building impacts on its users.

In summary – due to the size and fragmentation of property, sharing of data is vital for providing the context of market level performance.

Ethics

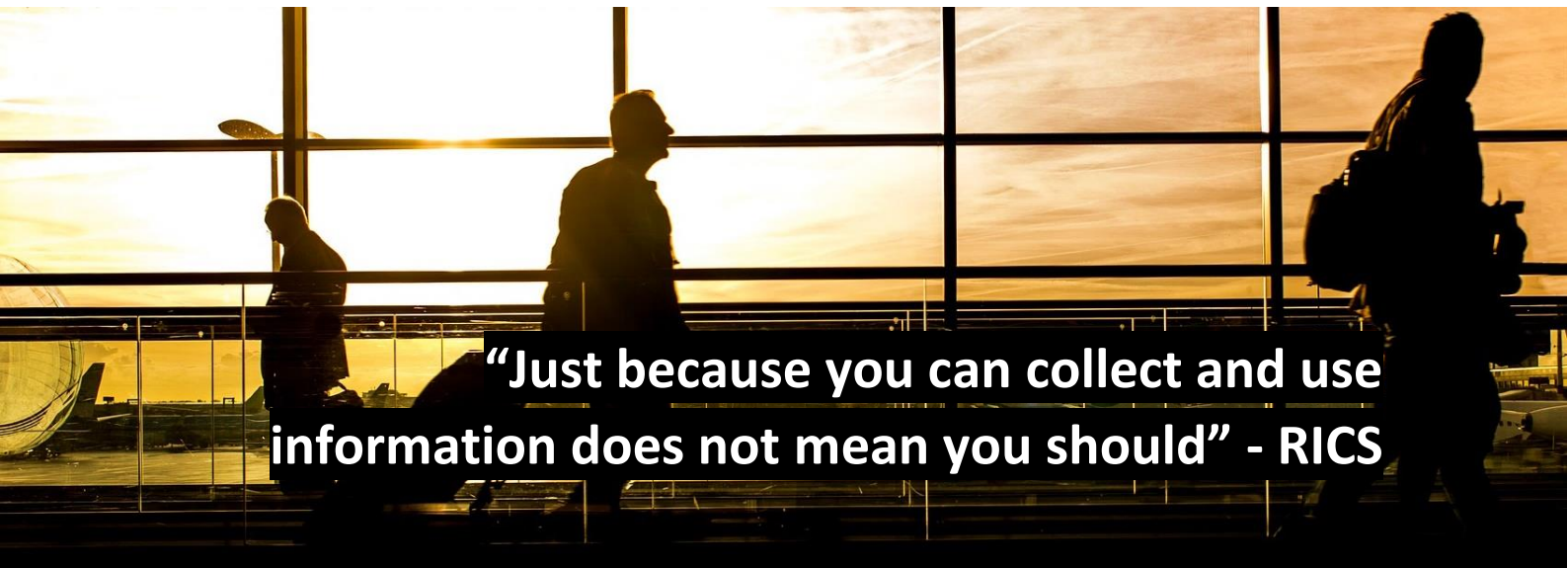
The fuel for the ever more digital real estate sector is data. As we collect more and more of it on people in the buildings they use, we face many human related risks. Personal data is, by definition, personal and so there are a number of potential privacy issues that property owners and managers need to consider in their use of this data. It is not just individual data points that need to be considered but the whole system where several data sets, collected from different sources, can be combined to identify people.

Whilst the data we are able to use is defined by technology and the data we are allowed to use is defined by the law, the data we 'should' be collecting and using ethically is less black and white.

Employers are collecting more and more personal data on their staff, from activity levels to location to health statistics. All this personal information has the potential to be shared with third parties. Is this ethical? What about transparency? In the same way that energy usage or air quality data is rarely shared with building users, neither is the personal information that is collected. Is it right ethically that people are filmed without their knowledge or permission when they walk into a building?

The ethics of data collection and use, the 'should' question, is a very human judgment which both building owners and managers are going to increasingly have to grapple with.

In summary – as more and more personal data is collected from building users, it is vital that the real estate sector addresses the ethical issues this brings. Beyond 'are we able to?' and 'are we allowed to?', we need to consider whether we 'should' be using and collecting it at all.



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Technology, especially location intelligence, is used throughout the life cycle of a smart city, from site selection and design through visualization and construction to maintenance. GIS (Geographic Information Systems) has the ability to scale across any expanse from an individual asset with a building to a virtually global context. It cuts across all aspects of smart city planning and development making it an ideal technology.

While Geospatial technology and data have long been limited to the outdoor world, new technology has now also paved the way for indoor geospatial. By activating the power of location inside buildings, occupants can access unprecedented levels of visibility and actionable data. This empowers management to draw conclusions on current space utilization and how it can be optimized. For example, in a corporate office setting, an underused conference room could be repurposed to create space for individual offices or a hot-desking area. Also, indoor maps can be introduced to help increase workflow efficiencies and productivity and are an enabler for smart buildings.

Geospatial data can also help businesses with the management of people. For those looking to recruit overseas talent or homegrown employees, location-based insights can support an HR strategy in finding the best-suited job applicants. For instance, a deeper analysis of the labour pool can help a company tailor its building's layout and operations to employee preferences for language, religious practices, and job training.

The speed of data

Data can provide invaluable feedback on the performance of a building with regards to the people within it. It can help monitor performance and either identify changes needed, or the impact of them when they are. However, the real estate sector historically has long feedback periods, data is often slow to come through and slow to be acted on. For the sector to truly realise the human benefits that can be gained from the improved analysis of data, processes need to be sped up to enable feedback loops to be shortened wherever possible to ensure that the insights are timely and actionable.

In summary – ensure that processes are in place to make sure that insights gained from data analysis are timely and actionable.

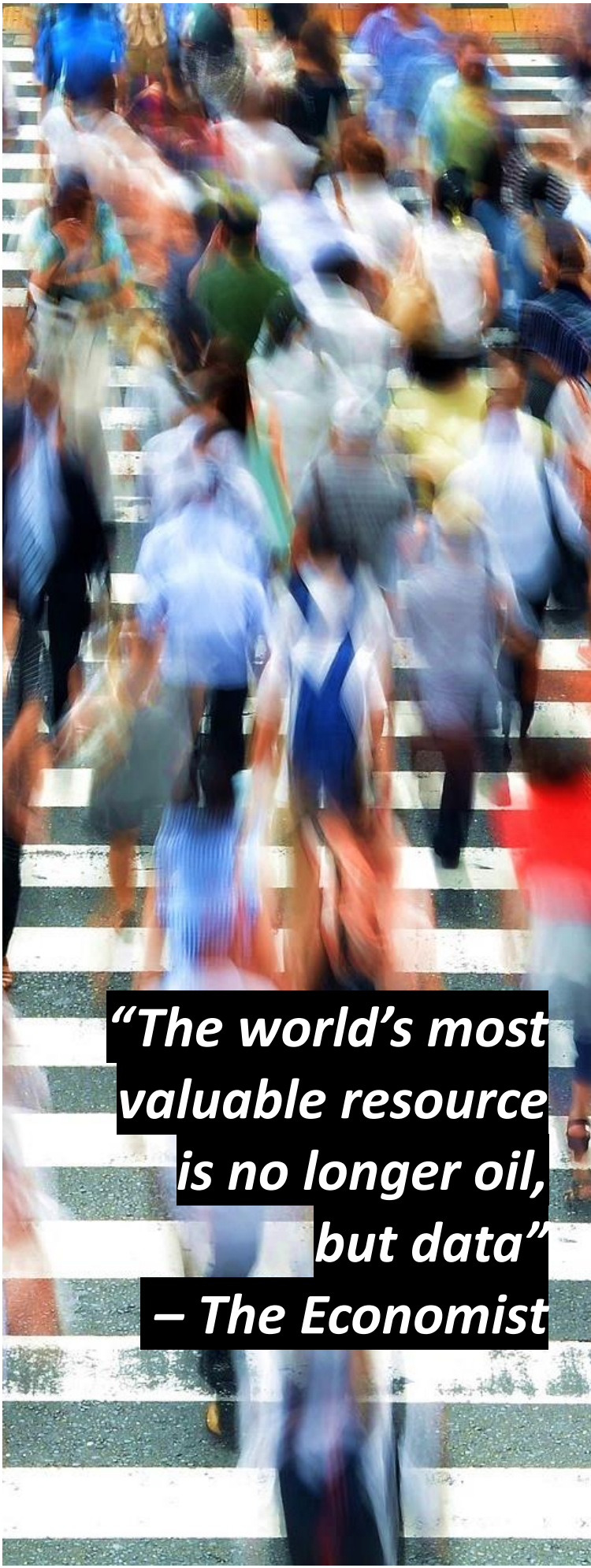
The value of data

For many businesses, the data that they hold on staff, customers or products, and what they do with it, is understood to be a core element of their business value. This is rarely the case for real estate companies and so the value of data is often underestimated or overlooked in the property sector.

Specifically focusing on buildings, the effective use of data can reduce running costs and through the better use of space lead to increased rents. The availability of this data therefore has a financial impact on the value of the property, however the value of the data itself is rarely included in the valuation of a building.

To be truly people focused in the future, buildings and businesses will need to be data driven and as this data becomes increasingly valuable, it will need to be considered within the valuation process.

In summary – data collected in buildings will increasingly be recognised as being valuable and having commercial value.



smartspaces.

Smart platforms provide the single most impactful solution to meet sustainability and ESG demands across the built environment. A well-formed Smart strategy will support investors, developers and occupiers of real estate to transform their portfolios for the next generation and is a crucial tool on the pathway to Net Zero.

What does Smart actually mean? Smart is responsive and adaptable. It exists to remove friction and build better connections by bridging the physical and the digital. We know better informed people make better decisions. So, Smart is also about reducing the anxiety that we all feel about everything, everywhere. Every individual can now view the air quality, energy consumption and their carbon footprint in buildings. But people won't always behave as expected when a small group set the rules for everyone else. Engagement across all parts of a business helps to balance driving efficiency with attracting and retaining talent. A Smart strategy can help companies prepare for every eventuality by getting the foundations for intelligent buildings right, from which it is then far easier to change the rules that aren't working for colleagues. The days of proprietary lock-in are over and Covid 19 has shown we need buildings to be as agile as humans by reacting in real time.

So how does it all join up? The easiest and most cost effective way to bring the workforce on the journey to Net Zero is to fully embrace mobile technology. The age of the super app is here and businesses can now provide secure access through physical barriers, connect colleagues to resource booking tools and the building concierge services enabling users to open, control, book and pay for things from a single app. This decade will see ever greater integration across corporate systems too, delivering a single, unified workspace experience all in one colleague 'super' app. Offering interchangeable functionality to allow enterprise software vendors and real estate apps to converge into a single platform, powered by a building operating system that self-optimises energy and services based on predicted and real time demand. Adding to or reducing connected functionality with a simple toggle. Today's Smart buildings are ahead of this curve and their users are fast becoming accustomed to expecting the new seamless, frictionless access to space-as-a-service. Most notably as traditional enterprise brands move to new HQs and leave legacy assets to their owners, who now need to reimagine and invest if they are going reduce the risk of obsolescence.

Looking forward, as Smart building platforms continue to perform and improve, we can imagine a world where brand loyalty to Smart apps will become further embedded this decade. Tech companies who consistently deliver for owners, operators and users, with tangible evidence of sustainable performance and improved user-experience, will become dominant. Wherever you are on your Smart journey, the best way to be in the know is to tour one of the many new Smart buildings and experience everything described above, first-hand.

SECTION 3: THE SECTOR

How buildings can work better for people is clearly important and whilst there are many steps that any landlord, property manager or occupier can take to address these, some need to be addressed at a sector level.

Landlords and occupiers

Landlords and occupiers are often pitched against each other, but both have the same overall aims. When considering the impact of a building on people, it will become more important for all parties to work together. It is common for either party to collect data and insights on a building's air quality, its influence in attracting and retaining staff, its connectivity or the activity of its users. Whilst this provides useful insights for both the landlord and occupier, they are often collected by only one of the parties and not shared with the other, reducing the benefits that might otherwise be gained.

Using offices as an example, this information will matter for both the owner and the occupier as user wellbeing or productivity becomes more obviously linked to the value of the office. A building that is effective in this regard benefits all and so sharing insights and data to understand this and improve performance needs to be a sector wide approach.

However, this also has its risks which need to be fully thought through. There are many privacy challenges with sharing data about individuals. Whilst data can often be anonymised, landlords may not want to take the risk of holding someone else's data and occupiers may have legitimate privacy concerns with sharing it.

There is little doubt that sharing some data between landlord and occupier can have benefits by providing a holistic view of the building performance in particular in relation to the people within it, however the insights and benefits of doing this need to be carefully weighed up against the risks.

In summary – careful collaboration between landlords and occupiers around data sharing would help maximise the insights gained by both parties on how their buildings perform in terms of the people using them.

The role of Government

Property is at the centre of many of the Government's objectives, from improving societal wellbeing to reducing carbon emissions. Furthermore, Government is one of the largest construction clients, occupiers and data holders which means that it has a key role to play in driving change in the sector.

The Government has three broad roles that it must fulfil. First, as a catalyst for change. This may be by leading the way as a major client or building user or by putting in place legislation where market and national interests are not fully aligned.

Over 30% of new construction contracts over the last decade came from the public sector[9]

[9] Building back better, greener, faster: transforming the construction sector, Infrastructure and Projects Authority (December 2020)

The way that suppliers, occupiers, landlords and the community interact with space has changed in recent times. As a result, employees' expectations of their spaces are changing. This directly impacts on companies' ability to attract and retain talent. Performance, talent and relationships between people, place and data are at the heart of driving the demand for digital buildings, along with changes to the investment landscape. The investment landscape looks at: climate change; sustainability and wellbeing challenges impacting on customers' business and the real and pressing need for benchmarking and tangible change that needs to be measured and evidenced.

The success of any asset will become more dependent on Property Managers' (PMs) and / or Facilities Managers' (FMs) ability to maximise the potential of technology. It is hugely important, therefore, that our people development and training strategy provides a scaffolded learning approach where PMs/FMs can pick up the skills through free-flowing knowledge, share through peer-to-peer inductions and coaching alongside a mobile digital learning LMS in the flow of work; or take up virtual and face-to-face classroom training experiences when more dedicated time is required to support learning. This approach can ensure an operational and practical understanding of a variety of tech-based products, solutions and requirements that, in the hands of our PMs and FMs, will enable them to collect and process data and make data driven decisions that will ultimately link people, place and processes.

Technology should be seen as an enabler. For technology to add value, it requires operational staff to have a good understanding of its abilities and limitations. Robust processes contribute and help achieve the desired outcome. The industry and role of PMs and FMs has evolved significantly. The rapid introduction of impact and symbolic technologies into the assets means there is an ever-growing importance to ensure Managers are exposed to these products. They must understand how they operate and the desired outcome. This can be achieved through a blended learning approach of classroom understanding and practical understanding of a variety of products, solutions and requirements.

It is hugely important to be able to provide training and development that will enable PMs and FMs to collect data, process and make data driven decisions and that clear and robust policies are in place as legislation evolves and keeps pace with the introduction of the new technology being made available.

Second, releasing data and leveraging technology to enable the private sector to thrive. Building safety, planning, home buying and selling are just a few of the areas of the market which benefit from the use of significant amounts of publicly curated data.

Third, as an innovator. Real estate is, by its very nature, evidence based. It is fast to adopt well proven ideas, but much slower to experiment with new ones. The Government's role in driving innovation is therefore essential; to directly, or indirectly drive R&D in real estate and provide the evidence needed to allow the sector to move forward in new ways.

However, these are not without their challenges. Real Estate is a significant factor in almost all Government departments and with both the sector and Government being so substantial and complex, moving people in the same direction is difficult. Any significant activity requires investment and the management of data has a cost.

There is therefore a clear need for Government to play a more joined up and engaged role in driving the use of technology in property forward for the benefit of individuals and society.

In summary – Government has a vital role to play in driving change in real estate for people and society, by acting as a catalyst, providing the data required and supporting innovation.

Industry bodies

Government has a major role to play in driving change, providing data and funding new initiatives. However, there is little doubt that much of the change required to better embrace technology and better serve people has to be driven by the property sector itself. This is a challenge given its size and structure; it is large, complex and highly fragmented. Few, if any individual companies, can have a significant impact on the sector individually and so it is important for representative organisations and industry bodies to drive change.

This change could include defining standards for the type of data collected on buildings and their users, setting related targets, identifying and developing key digital skills or bringing organisations together around people challenges to identify and test technology solutions.

Whilst industry bodies leading on the change is a step forward, there is also significant fragmentation here. ***According to one construction wiki, there are 389 associations and institutes in the UK Construction sector alone***[10]. More collaboration between bodies is going to be needed with regards to data and technology. This includes organisations who would not otherwise need to engage. For example, a construction professional and a property investment professional rarely cross paths in their day-to-day roles, however, they may well use the same data sets to do their jobs. Data cannot be siloed in the same way as job roles or professions across the sector.

In summary – industry bodies have a vital role to play in supporting the property sector in becoming more people focused. Where this entails the use and sharing of data, collaboration is the order of the day, even between organisations that would not otherwise engage with each other.

Culture and skills

Perhaps the single most important development needed across the sector to enable the effective adoption of technology is the sector's culture. As mentioned, real estate is, by its very nature, slow, tangible, stable, low risk and evidence based. These are the

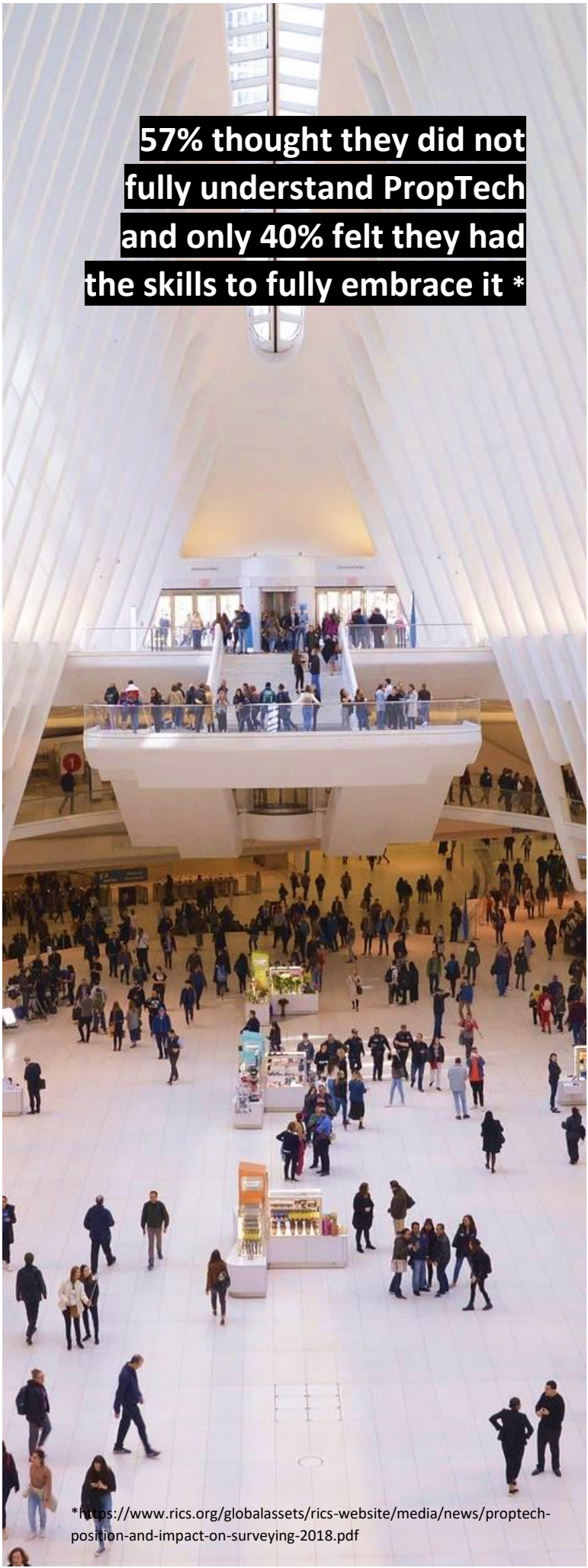
[10] Design Buildings: The Construction wiki

strengths of the sector in many ways and exactly the approach needed for traditional buildings. However, technology requires exactly the opposite culture – fast, intangible, high risk and forward looking. As organisations use more and more data and technology to enhance buildings for their users, the property sector will have to evolve its culture to effectively blend the characteristics needed for buildings and those needed for technology.

Without a change in culture, the effective use of technology to better meet people's needs will not be possible. This cultural evolution is not limited to building owners and managers, but also to people using buildings as they are asked to evolve the way that they work and live through ever-changing technology.

In line with the cultural changes, the real estate sector needs to evolve the skills that are required for a more digital future. As job roles become more specialist, everyone will require a base level of technology skills in order to engage with colleagues and do their own job properly. However, the 'human skills' will be just as important; creativity, ethics and judgement, for example, are still required to make the best of digital innovations in the workplace and ensure that decisions made are truly people focused.

In summary – to effectively leverage the data and technology available within its reach, the real estate sector must evolve its culture and learn new skills to better meet the needs of individuals and society.



*https://www.rics.org/globalassets/rics-website/media/news/proptech-position-and-impact-on-surveying-2018.pdf

ACTION NEEDED

Anyone involved in the use of buildings needs to ensure people are at the centre of the decision-making process and whilst technology can assist this, there is no doubt that they must achieve a delicate balance with the application of that technology.

For real estate to move forward with technology to better meet the needs of individuals and wider society, a number of areas require attention:

Hardware – investment in new technology is required to better meet people's needs in a hybrid world. This covers a vast range of use cases, from new kit for employees to enable successful hybrid working to installing building sensors to monitor and improve comfort levels of building users. However, every application of technology should have a clear outcome in mind to avoid using tech simply for tech's sake.

Mental health – people's constant exposure to digital applications and technology and the impact on their mental health should be considered in the design and use of real estate. For example, buildings of the future could have technology free zones and employers could prevent meetings outside of core hours, or offer more wellbeing options, such as gyms and spa treatments, to provide time away from technology.

Culture – a change in culture is required in order to maximise the benefits from smarter buildings with more transient customers and employees. This might include employers adapting management styles to respond better to a remote or hybrid workforce as well as a shift towards a more agile, risk averse culture for the whole sector.

Productivity – software applications are helping employers to measure activity levels of their staff but there is ambiguity over how productivity should be formally measured. Employers would benefit from a recommended and defined framework for the measurement of productivity.

Transparency – landlords and occupiers need to communicate better about what data is being collected in buildings. This could be in relation to how a building performs, for example air quality, or about the people using it. This will allow people to rate and compare the real estate they use and ultimately could drive improvement.

Data ethics – as the amount of data that owners and managers collect from buildings increases, so should the focus on the ethics of collecting and using that information and whether the benefit is proportionate to the use.

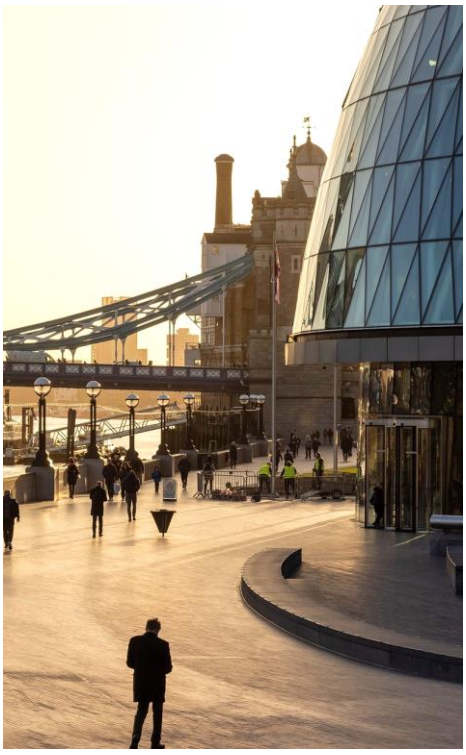
Better data standards adoption – as the sector focuses more on people, it is essential it provides and adopts well-defined standards for data relating to building performance to allow the efficient use and exchange of data at a building or sector level.

Value – the real estate sector needs to recognise the value of the data it collects from buildings and ensure it is appropriately measured and managed for commercial purposes and consider it in the valuation of buildings themselves.

Market level data – sharing market wide data on building performance across the sector needs to become more common in the future. Having access to occupational data and building performance data at a market level will help owners and occupiers compare the health and productivity levels within a building, assess ROI of technology and compare performances across portfolios.

Risk assessment – the risks of digital innovation must be considered by building owners and managers, including the human risks around health and data sharing and the cyber related security risks of onboarding new technology systems.

Collaboration – an increase in collaboration between Government, industry bodies, academia and individual companies across the sector is imperative for progress. All of these organisations need to come together regularly to identify and collaborate around the key themes and challenges relating to building performance and its future impact on people. Digital innovation is bringing exciting opportunities to the sector, but without collaboration, only limited change will happen.



ABOUT REVOLVE

REvolve is an Alpha Property Insight initiative. Members of REvolve consist of leading names in the real estate sector which come together to provide unique perspectives on a particular topic. Membership of REvolve demonstrates the members' thought leadership and willingness to explore some of the most pressing challenges that the real estate sector faces in a collaborative way.

Membership does not imply agreement with or endorsement of all of the views expressed in the report. Members provide their own 'Expert View' on the topic.

Each paper is written by Alpha Property Insight and is based on both extensive desk research and a round table discussion with members.

REVOLVE MEMBERS

Clifford Chance

We think beyond the law and see the bigger picture. At Clifford Chance we recognise that rapid advances in technology are raising both opportunities and challenges, significantly impacting our clients' business models, their growth strategies and even day-to-day decision making. Our clients are at the forefront of the Real Estate industry and rely on us to help them deliver the biggest and most innovative transactions, and navigate an ever changing legal and regulatory landscape. For the last 7 years, we have been ranked the standalone top firm for European Real Estate by Chambers, and when combined with our pioneering technology group which comprises over 600 tech-savvy lawyers located around the world, we lead the way in guiding our clients wherever their real estate strategies taken them. We are uniquely placed in the market, acting across the real estate industry's leading players on all asset classes including office, logistics, hotel, retail, residential, data centres and new communities. Clifford Chance is one of the world's pre-eminent law firms with significant depth and range of resources across five continents. For further information on our services, visit www.cliffordchance.com

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International WELL Building Institute

The International WELL Building Institute (IWBI) is a public benefit corporation and the world's leading organization focused on deploying people-first places to advance a global culture of health. IWBI mobilizes its community through the administration of the WELL Building Standard (WELL) and WELL ratings, management of the WELL AP credential, the pursuit of applicable research, the development of educational resources, and advocacy for policies that promote health and well-being everywhere. More information on WELL can be found here.

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Knight Frank

At Knight Frank, we provide innovative property solutions for our clients that add tangible value, across a variety of sectors and services.

By the nature of being a partnership, our decisions are made by and for our people and we focus on long-term outcomes. We know, that to achieve great results, we need to collaborate effectively and communicate clearly.

Our purpose is to work responsibly, in partnership, to enhance people's lives and environments. For our people, this means that we empower everyone to have autonomy in their role and encourage them to think differently about how we can make a positive impact as a firm. For our clients, this means that we provide innovative property solutions to add tangible value, across a variety of sectors and services.

KPMG

KPMG is a leading provider of professional services, with nearly 16,000 partners and staff across the UK and an international network of independent member firms operating in 144 countries and territories. Our real estate professionals draw on experience from a variety of backgrounds, including accounting, tax, advisory, banking, regulation, strategy and corporate finance, to provide informed perspectives and clear solutions throughout the asset and investment lifecycle. Our client focus, commitment to excellence, global mindset and consistent delivery build trusted relationships that are at the core of our business and reputation.

LGIM Real Assets

LGIM is one of Europe's largest institutional asset managers and a major global investor. LGIM manages £1.3 trillion* in assets, working with a range of global clients, including pension schemes, sovereign wealth funds, fund distributors and retail investors. LGIM Real Assets has assets under management of £39 billion* and is one of the largest private markets investment managers in the UK. Investing in both debt and equity and across the risk/return spectrum, LGIM Real Assets actively invests in and manages assets across commercial, operational, and residential property sectors, as well as infrastructure, real estate, corporate and alternative debt. Taking a long-term view to future proof our investments, LGIM Real Assets continues to lead the industry in ESG performance, considering all environmental, social and governance issues at asset level as well as portfolio level.

** at 30 June 2022*

Smart Spaces

Founded in 2010, Smart Spaces now powers over 60 million sq ft of UK real estate, over 20 million sq ft of which is located in London. The London based user-experience and software development team, which has 44 members of staff, has an extensive software development portfolio and delivers a number of smart workplace solutions for industry leading real estate clients including: AXA IM Alts, Aviva, Columbia Threadneedle, GPE, Helical, AshbyCapital, Three Mobile, Workspace Group, Sellar and 22 Bishopsgate – the worlds smartest skyscraper.

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