The Internet of Things and the real estate sector

14 MAR 2018
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As the fourth industrial revolution gathers pace, even that most traditional and archaic sector of all, real estate, is opening its arms to embrace the technology that is infiltrating all aspects of the built environment.

Smart homes, smart buildings and smart cities are now part of everyday life, and they will only become smarter and more connected with the world around us as time goes on. Technological advances are revolutionizing how the sector operates for all existing participants (such as landlords and tenants) whilst drawing in new players who have technology at the core of their business and are fast changing the rules of the real estate game.

A more connected physical world

Buildings are becoming a host for a wide range of Internet of Things based applications. Sensors are increasingly being installed inside and outside buildings to gather a vast array of data, which can then be analyzed and exploited in order to optimise how a building and its infrastructure is occupied and operated. Examples of how the Internet of Things is already, or could soon, impact the real estate sector include:

- Systems and buildings can learn and react to the behaviour of its occupants - not only in relation to a building as a whole but down to individual rooms. Instead of manually operated heating and lighting controls, HVAC systems can now adjust heat, air conditioning and lighting in response to the presence or absence of occupants. The longer and more extensively any such system is used, the more it is able to learn about usage patterns and, in turn, how to maximize performance and reduce energy costs.
- Sensors embedded into a building's infrastructure allow for a proactive instead of reactive approach to repair and

maintenance. Allowing an occupier to address issues before they arise can avoid disruption to operations and the need for costly investigative works to identify where potential problems are located.

- Smart phone apps which are integrated with a building's systems can guide occupants to vacant desks or direct them to their next meeting by the quickest route possible (and ensure the coffee is brewed and hot when they arrive!). In the same way, connected cars will soon identify traffic jams and automatically re-route drivers onto the quickest route before locating the nearest car park with free spaces.
- Constant monitoring of how space is used and occupied, from conference rooms, to offices and even individual desks, allows businesses to make real time decisions about how much space is needed (perhaps further promoting the global trend for a flexible office space) and can drive down costs per square foot.
- Linking security systems to smart phones, security passes or wearables (such as a FitBit) to allow facilities management and the emergency services to identify if a building is clear or where those trapped are located.
- Digitized logistics management can enable companies to ensure that their products are located where and when they are required, as well as best determine how they are stored and delivered. This allows non urgent products to be stored further away where land costs are cheaper, while products that are required as instantaneously as possible to be located closer to customers who are willing to pay a premium for that service, thus increasing revenue.
- Electronic "beacons", placed throughout properties, can push useful information and notifications to visitors' phones at specific locations, allowing for people to interact with the built environment in more varied and exciting ways than was previously the case. For example, retail stores can push advertisements and discounts to a customer, whilst making use of location-based analytics to track footfall and the success of individual campaigns.
- Sensors in dust bins will allow local authorities to send refuse collection lorries to locations where the bin is full, which helps to prevent wasted journeys and ensure a healthier environment for the public.

As those examples show, the Internet of Things is revolutionizing the real estate sector and has the potential to deliver real benefits to everyday lives. However, as in other sectors, those who fail to adapt and embrace modern technology risk being left behind and missing out on new revenue streams or suffering reduced revenue as, for instance, tenants (now accustomed to modern ways of working) use connectivity and technology as key factors when choosing where to locate and how much rent they're willing to pay. Indeed, businesses now exist solely to measure and certify a building's connectivity (much like an Energy Performance rating certificate in the UK). Businesses that do not embrace technological change may never enjoy the advantages of adaptable, comfortable and healthy workplaces and the opportunities, such as increased productivity and employee retention, optimized space usage and reduction of costs, that a connected workplace can offer.

Legal Issues

As with any technological change the use of Internet of Things in the real estate sector throws up a number of legal challenges and questions:

1. Data protection and privacy

Internet of Things solutions have the potential to capture huge volumes and varieties of data, including data that is potentially private or personal. Not only does this need to be filtered to ensure that the data collection is targeted and efficient, but businesses will need to ensure that appropriate precautions against the misuse of data are an inherent part of the design of the solution.

The final countdown to the enforcement date of EU General Data Protection Regulation on May 25, 2018 is on, and with it comes a new world of regulatory controls and scrutiny over the way in which personal data is collected and used. Businesses that use connected technology in their buildings and infrastructure to collect personal data will need to place privacy compliance at the heart of their operations and ensure that this is an inherent part of their Internet of Things solutions, or risk facing significant sanctions. A privacy-by-design approach will enable businesses to quickly adapt their privacy compliance measures to cater for future changes in technology and regulation.

2. Security

Users of connected solutions will need to be reassured that their systems will not be left open to attack by

malicious third parties, potentially allowing access to private and valuable data or the ability to disrupt the operation of, or even break into, buildings. Security must be a primary focus for technology providers when designing Internet of Things applications, and operators will likewise need to implement strong security measures (and update such measures on an ongoing basis) to prevent data falling into the wrong hands.

3. Risk allocation and liability

The possible implications and benefits from Internet of Things based technologies are fascinating and exciting but there remains the issue of what happens when something fails. In a more inter connected system with a variety of sensors and devices involved, the question of who bears the responsibility and the extent of any liability needs to be considered carefully.

These issues need to be addressed in advance when contracts and terms and conditions are prepared. As with cybersecurity, convincing people to take the next step with entrusting not only their data, but in certain circumstances their health and lives, could require the providers of technology to share a greater proportion of the risk. The extent to which such providers are willing to accept risk will of course depend on the level of reward offered.

4. Retro-fitting

Although sensors can be small, retrofitting them into older buildings to make them "smart" could be a costly challenge for developers, as sensors will need to interact with equipment that can be linked up. For instance, old HVAC systems may require wholesale replacement and other alterations may require permissions from landlords and neighbours as well or planning consents from local authorities.

5. Service Charge and Infrastructure

With more and more tenants expecting reactive buildings, with high levels of connectivity, we can expect to see Internet of Things related clauses making their way into the service charge provisions in leases. Services that were traditionally for individual tenants to procure - such as high-speed internet - could increasingly become a standard service provided centrally by the landlord, with provision for the costs to be shared amongst tenants and, going further, perhaps even the need for additional clauses to regulate how the relevant services are used.

In stark contrast to the unconnected tangle of competing services, used by individual tenants, that are often found within today's properties, it is likely that the expectation will shift to landlords to install and maintain a central network of connectivity throughout properties from the outset. In turn, owners of investment properties will be expected to contract with a wider range of stakeholders than is generally the case at present.

The growing impact of the Internet of Things is fundamentally altering how the sector operates and what it can deliver for landowners, tenants, developers, lenders, the public and government across all areas including development, offices, retail, industrial, infrastructure and public spaces. Its onward march will not slow down, and all those involved in the real estate sector need to consider how technology will impact their business and how they will address the legal issues it presents.

The authors would like to acknowledge the contribution of Conor Boyle and Imogen Palmer, trainee solicitors at DLA Piper UK LLP, for their contributions to this article.