



Technology and the REIT sector



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Real estate has not historically been a sector leading the discussions around groundbreaking technology, but at the same time, it also isn't a sector that has been averse to employing new digital advancements. On the operational side, smart buildings have been part of an ongoing conversation with regard to operational efficiency and sustainability. The focus of cybersecurity has traditionally been on the back office, but as building management systems (BMS) become more technologically enabled to facilitate connectivity and data collection from the various systems, cybersecurity of physical assets is becoming increasingly important. From the customer side, the internet has changed the way all businesses interact with the public – websites and mobile devices have created important interfaces for businesses, social media has forced accountability and analytics have been a powerful enabler for companies to make better business decisions all around.

Where are we now?

More REITs are now integrating technology into many aspects of their businesses, both to optimize their internally focused operations as well as customer-facing operations. By way of example, companies focused on a customer experience are harnessing the power of technology and using data and analytics to adapt to the needs of their customers based on data collected in real time. Mall owners are tapping into the wide variety of data generated by users of their space in order to measure activity and understand layout effectiveness.

Elsewhere, single-family rental businesses have been able to dramatically scale their operations in no small part because of taking a technology-centric approach to their business. For example:

- ▶ Leasing agents have been replaced with electronic prescreening inquiries that are used to prequalify a prospective tenant. If the prequalification is successful, the prospect obtains access to unit keys in lock boxes to allow them physical access to walk a rental property.
- ▶ Applications to lease properties are made online, with a centrally located team undertaking credit due diligence within a few hours.
- ▶ Prospective residents gain access through automated means without a leasing agent, and the leases are then produced digitally. The tenant's first human encounter comes at move-in.

- ▶ Multifamily resident portals and ledgers have been modified to enable online payments, which include utility costs and maintenance schedules, which are routed through centers staffed by specifically trained operatives.
- ▶ Electronic vendor portals are used to offer and accept jobs. Purchase orders are used to monitor the process and automatically update to central books.
- ▶ Mobile apps are used to help manage interactions with tenants during the move-out process to improve unit turnover and manage reimbursement of tenant security deposits.

Understanding how to adapt traditional business models to the changing technology landscape has been a worthy exercise for companies willing to make the investment. In some cases, technology is enabling business models that were not previously viable. For those who don't embrace these advances in technology, it may become a competitive disadvantage.

The rewards of using technology can pose unintended risks

Technology offers plenty of opportunity but with it comes new and different risks. Operational risk, competitive risk and, of course, cybersecurity concerns are current challenges faced by management teams across the sector.

When considering risk, there are obvious cyber threats, but there is also the risk of having no plan for becoming a digital enterprise. Technology is leading to an accelerated pace of change across real estate markets and competition no longer looks and acts as it did in the past. It is, therefore, important to stay abreast of the newest trends in technology not only to keep pace with competition but also to forge a competitive advantage. While there is risk in adoption beyond cyber, like costs of talent management and technology obsolescence, organizations need a solid understanding of where change is occurring, a strategy that's versatile and one that protects their assets and stakeholders alike.

Competitive risk

Well-known players in property management and real estate development are taking technology investment one step further with targeted acquisitions. They have been buying small technology companies to get ahead of competition and to leverage



an early mover advantage. Acquisitions have included small tech firms with competencies around artificial intelligence and data analytics – a move that would have been almost unheard of just a few years ago but now may become a necessity to remain competitive.

For REITs, whether buying tools, developing their own tech-based solutions or potentially acquiring new technology capabilities, demonstrable cost benefits are needed to justify the capital spend. Acquisitions may provide an opportunity to leverage first-mover advantage but the rewards must be properly balanced with the potential risk.

Operational risk

Investment in technology can be costly. Not only are there direct costs attributable to the technologies themselves, but there are organizational issues that must be considered, such as company culture, talent and training, as well as change management. It's also important to consider that, in most cases, there is a limited shelf life for new technologies, with most becoming obsolete

within two to five years. To mitigate these risks, it is important for companies to clearly define what they are trying to achieve and set realistic goals. Becoming digital doesn't happen quickly, but with your internal stakeholders on board, the use of external partners and consultants when needed and a proper strategic plan in place, the transition can be much smoother. REITs need to be ready and capable to adopt the best ideas as they look to accelerate the rollout of technology across their platform. This brings many challenges; disparate teams and limited resources mean prioritizing resources is essential. Establishing an advisory team that brings together individuals from across different aspects of the business is a good first step to confirm all parties' interests are represented. For public companies that need to meet regulatory requirements, it is particularly important to develop a process that brings discipline to onboarding new technology. This process should cover design, testing, training staff and integrating systems.

For many organizations, the addition of new technology will be a continual process with specific milestones around certain new initiatives.

Cybersecurity risk

REITs have two focus areas when considering cybersecurity:

- ▶ The Information Technology (IT) environment that consists of the corporate enterprise network and the associated business applications
- ▶ The Operational Technology (OT) environment that consists of the BMS and building functions such as HVAC, safety, security, elevators and lighting

Enterprise IT security is not unique to the industry, and recent news around massive breaches across many sectors is a constant reminder that, regardless of diligence, the threat is always present. Regulatory bodies have been working to create frameworks and advisories, but considering that the threats are constantly changing, blanket regulation is a challenge. The American Institute of Certified Public Accountants looks at cybersecurity not as something that is addressed once and then considered to be dealt with, but as an iterative process. The U.S. Securities and Exchange Commission (SEC) provides guidance around reporting incidents, placing cyber attacks in line with natural disasters – one-off events – that should be disclosed when material (see Table 1 for examples of impact). Ratings agencies have stated that cyber readiness is factored into credit risk, which varies from sector to sector. Finally, insurance companies are assessing risk and adjusting premiums to reflect the control environment of companies in relation to cyber.

The more specific challenge that REITs face is managing a portfolio of properties consisting of various BMS vendors and models. These properties vary in age and technological advancements and often were acquired at different times. This leaves companies with a blend of new and legacy properties with disparate networks, building systems and little information around the system access configuration or the security protocols implemented at the time of installation. This is further complicated by BMS not being installed with cybersecurity in mind but instead focusing on availability and uptime of the systems they control – no one wants the HVAC to go offline in the summer or the elevators to stop working. The lack of security in BMS can be seen in several areas:

- ▶ Typical BMS rely on third-party remote access for support and maintenance. Was the remote access connection configured securely?
- ▶ BMS require network access. Is the BMS network firewalled from the internet or the enterprise network?

Table 1: SEC guidance around the impact of cyber attacks

According to the SEC: “Registrants that fall victim to successful cyber attacks may incur substantial costs and suffer other negative consequences, which may include, but are not limited to:

- ▶ Remediation costs that may include liability for stolen assets or information and repairing system damage that may have been caused. Remediation costs may also include incentives offered to customers or other business partners in an effort to maintain the business relationships after an attack
- ▶ Increased cybersecurity protection costs that may include organizational changes, deploying additional personnel and protection technologies, training employees, and engaging third-party experts and consultants
- ▶ Lost revenues resulting from unauthorized use of proprietary information or the failure to retain or attract customers following an attack
- ▶ Litigation
- ▶ Reputational damage adversely affecting customer or investor confidence”

Source: SEC, <https://www.sec.gov/divisions/corpfin/guidance/cfguidance-topic2.htm>

- ▶ BMS, like any other systems, require regular software patching – not just for reliable operations but to maintain security levels. Lack of patches are the number-one reason for cyber breaches. Is the BMS and associated systems' patch level current?

The result is that cyber risk as it relates to buildings is often misunderstood and, therefore, lacking in oversight. This is why BMS are referred to as “forgotten networks.”

Many BMS today are targeted by cyber criminals due to the inherent lack of security. Many BMS networks have fallen prey to ransomware attacks, denial of service or worse yet, unauthorized access. These can result in unwarranted access to not only the BMS building controls but any other commingled network on the property, such as the corporate enterprise or even a tenant.

Thinking about tomorrow

Investment in real estate and property technology (prop tech) has dramatically increased in the last five years. Technology companies are increasingly involved in the “real estate as a service” business, and sector convergence will force the real estate industry to consider issues like autonomous vehicles, operating in a shared economy and the further impact of e-commerce on real estate.

Traditional process-driven organizations are now being disrupted by “2.0 organizations” of the information age. These organizations use data as a strategic asset and build entire business models around leveraging insights to deliver exceptional products and services. This is often in contrast to traditional organizations that are process-based, and the data generated is frequently seen as a secondary byproduct.

2017 Forbes Insights/EY data analytics survey

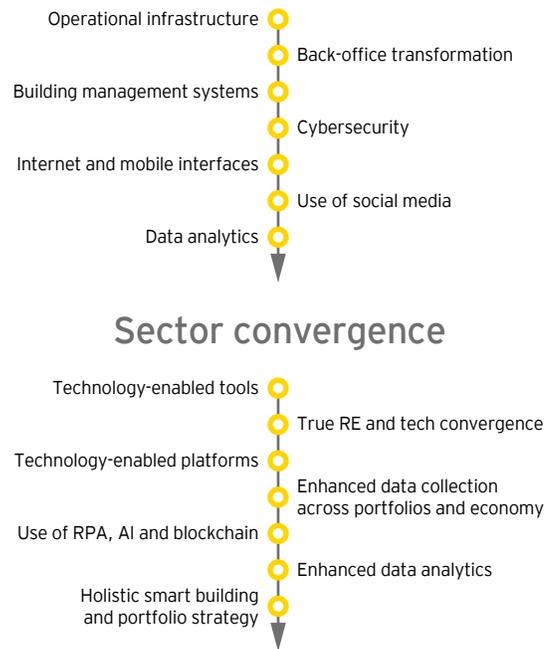
Sector convergence

As sectors converge and real estate continues to be disrupted by well-known players looking more like tech companies than real estate companies, it's a good time for REITs to reflect on their digital readiness and the impact of technology on their business and the sector as a whole. When discussing raw technology, the advantage belongs to tech companies as they were born through digital means while more traditional companies have had to evolve. But there is also an advantage to understanding tradition – specifically, pain points that will always exist in real estate, with and without technology. Combining the values of tech companies that are built on analyzing consumer wants, needs, searches and likes, with the historical knowledge that traditional real estate companies possess will create a powerful and future-focused strategic advantage. Considering that the average person spends 90% of his or her time indoors,¹ and that by 2021 it's projected that there will be 3.6 billion devices installed in commercial buildings alone,² intelligent buildings offer their owners a tremendous opportunity to better understand occupant needs, productivity and behaviors. It is important to remember, however, that the value doesn't lie in data collection alone; rather, opportunity exists with the analysis and action items generated from that data.

¹ <http://leed.usgbc.org/id-c.html>; accessed on 5 January 2017

² <http://www.memoori.com/buildings-make-majority-connected-devices-much-building-now-connected/>; accessed on 6 February 2017

Figure 1: Evolution of real estate technology



Technology-enabled tools

The opportunity to leverage technology across a platform will increase as an ever-expanding number of technology-enabled solutions are offered to the real estate industry, and scale is created as more real estate companies adopt them. Many of these will be generic products that can be incorporated into a business at relatively low cost and with only minor modifications. But businesses will also increasingly look to create products tailored to solve specific issues. This development process can be expensive, but it may offer a unique advantage to the company.

For more standard products, technology providers can often retain the ownership of data produced by the tool. For many organizations, it is important to own the data they produce in order to incorporate it into a wider analytics program.

Enhanced data collection will result

Technology has already enabled real-time data gathering in massive volumes and facilitated the processing of that data at record speeds. Businesses can act on findings almost immediately. Data is valuable, but data is nothing if the right parameters don't exist to collect and compartmentalize the information available

in order to make actionable decisions. Properly structured analytics help management teams better understand their stakeholders, from heat mapping in malls, occupancy of floors in office buildings at any given time or to better understanding employee engagement.

As technology becomes more prevalent across a REIT platform and capabilities mature and become increasingly complex, potentially drawing in countless data points, a complete data integration solution will need to encompass discovering, cleansing, monitoring, transforming and delivering data from a variety of sources. Delivering data into a database or warehouse and providing “analytics-ready” data in order to extract and present actionable insights will be essential. A REIT, therefore, needs a platform capable of housing, integrating and utilizing the latest technology but also one that is flexible enough to seamlessly adopt new concepts without exposing the organization to undue risk.

Real estate will see dramatically improved data collection across an industry that has historically been relatively opaque. But the personal nature of so much data means the rewards are unlikely to be visible to all. For those with sufficient portfolios to be best able to exploit this trend, the benefits will be significant with unprecedented insight into the role, use and prospects of specific assets.

Robotic process automation, artificial intelligence (AI) and, potentially, blockchain will be tools that help facilitate this platform

Considering that machines store, retrieve and acquire new data at lightning fast speeds and with great accuracy, management teams will be able to improve decision-making across both front- and back-office functions by employing AI and robotics. From a back-office standpoint, software robots can take control over routine and manually intensive processes. This will save significant time, provide more accurate results, leave a clear audit trail and free up human capital for more value-added and judgment-based functions such as strategic analysis and decision-making. From a front-office, customer-facing standpoint, system data can be paired with unstructured data from social media, blogs and other profiles to more accurately gauge the needs and preferences of the customer, allowing for more tailored experiences. For example, in the hospitality space, data like number of stays, average spend per stay or visit, properties visited, mall or brand preferences and shopper

profiles can be used to better understand individual preferences. This allows marketing teams to more effectively “speak to” the customer and to spend marketing dollars in a more targeted and efficient manner. It also allows for a better understanding of whether properties have the right mix of things such as merchants and activities, and it allows them to adjust that mix as customer demand and tastes change.

New ways of doing business will also be required. Given how rapidly the leasing environment is changing, be it shorter leases, revised terms or new accounting treatment, there is an increasing need to simplify contracts and to add transparency to the process for all parties. Blockchain may be part of this solution. There are many potential benefits to executing smart contracts on the blockchain, but, simply put, blockchain is secure and resistant to hacking given all parties must agree to changes and all changes are time stamped, verifiable and can offer a complete picture in rapid time compared to the current process. In the blockchain, it’s one and done, meaning you put it all in one place once and that can be accessed by anyone for viewing.

Enhanced data analytics will deliver proactive and predictive management, which, in turn, will help keep buildings relevant

Analytics will evolve further to help business better understand the built environment, allowing assets to be tailored to their specific location. The use of technology-enabled tools across a platform that seamlessly integrates technology with real estate in order to optimize the collection and delivery of data will help move organizations up the value chain from a reporting and analytics perspective, and crucially do it all in a safe environment. From the creation of standard or ad hoc reports that address what happened, companies will move to predictive analytics supported by real-time data that looks to identify what will happen next in order to optimize the decision-making process.



One important benefit of increasingly smart buildings and enhanced analytics will be much greater control being offered to tenants in how they use space and stronger communication



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between tenants and landlords. By placing a greater emphasis on customer experience and improving customer satisfaction and, in particular, productivity and well-being, this process will strengthen the partnership between landlords and tenants. An enhanced occupant experience may potentially result in increased revenue and will almost certainly deliver improved operations. In many cases, it will also help specific buildings remain relevant by better understanding their role in the local economy. In a world where disruptive forces are blurring the lines between traditional sectors and fundamentally changing the way people live and work, this will become increasingly important in order to maintain occupancy and cash flows.

Smart buildings evolving toward a more holistic view

Smart buildings discussions have already moved toward a more holistic view, using data and analytics not only to optimize buildings from an operational standpoint but also increasingly to understand the occupants. The speed of evolution will likely accelerate in an unprecedented age of rapidly advancing technology, where every-day decisions can be analyzed and optimized given the vast amounts of data that the built environment, devices and online interactions collect and transmit. Data is everywhere, and when properly tapped and captured, solutions can be tailored to drastically cut costs and enhance every-day experiences. Behind the scenes, energy, resource and systems efficiency data can enable owners to make better decisions related to managing costs, driving sustainability efforts and optimizing the health and safety of building occupants. Understanding the four pillars that drive intelligent building investment – energy efficiency, building occupant satisfaction, operational improvement and sustainability – and how they relate to your business can be crucial in taking advantage of government incentives, avoiding penalties, maximizing resources through effective building management, and more. While the lines are blurred as to the business area focus for each pillar, managed effectively their collective savings impact to the bottom line is material.

Internet of Things (IoT) devices will need to be integrated with legacy BMS networks

At the core of smart buildings are the IoT devices that can collect data and transmit it to the cloud for near real-time analytics. The integration of IoT devices with legacy BMS networks will,

therefore, be essential. This will drive a need for integration and expansion of the OT systems and BMS networks. However, deployment of IoT devices further expands the cyber attack surface. It is imperative that today's BMS networks and tomorrow's IoT deployment be part of a comprehensive cybersecurity review. Properly executed, integration of these systems will improve a property manager's understanding of the risks and vulnerabilities associated with each property. Effective integration will also better inform a property manager's decision-making when it comes to choosing specific controls and assessment tools to drive the compliance and security of the BMS.

Technology may ultimately impact valuation

Implementing technology across a platform is an expensive process, particularly if products are created in order to solve the many challenges that are unique to each different real estate subsector. Balancing the cost benefits will remain a critical issue, and prioritizing the areas with the greatest need remains essential. Falling behind on technology adoption, however, may in time present its own challenges if it allows competitors to better value assets and identify acquisitions that may be a better fit than others. As more and more companies adopt these baseline technologies and an increasing number of buildings qualify as smart, the bar will reset with anything below it potentially selling at a discount with all other factors remaining equal.

Technology will continue to create both challenges and enormous opportunities across the real estate sector. Technology will be highly disruptive in fundamentally redefining the way tenants in all industries use real estate. But it is not just about disruption; technology will help the real estate industry design more sustainable buildings. It will also help real estate owners better understand the standing of specific assets within a certain submarket, enhancing their ability to make informed buy, hold or sell decisions, and technology will facilitate a wide array of benefits across both front- and back-office functions. The accelerated pace of change being seen in our markets will challenge management teams to stay abreast of trends that evolve rapidly, but a flexible, technology-enabled platform will position them to lead the way in an increasingly fast-moving industry.

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