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FOR THE WORLD'S PRIVATE REAL ESTATE MARKETS

FUND SERVICES & TECHNOLOGY

A special supplement to *PERE* magazine

Time to board the technology train

Not so long ago, a report on fund services would likely have been received with much head scratching among senior industry figures more interested in the sexier activities of fundraising and dealmaking. Viewed as the part of the business that ticked over quietly behind the scenes, it simply did not warrant much attention. How quickly things change. It is now front and center of the business. The old moniker – the 'back office' – is even considered a pejorative term.

The full suite of factors that have facilitated this perception shift are too numerous to list here, but playing a big part certainly are: the increased level of investor due diligence of operations; the requirement for greater transparency and speedier; more detailed reporting; the volume of regulation and new risks impacting the sector; and a need to seek new ways to demonstrate performance and deliver value-add. Efficient, streamlined and cost effective operations are integral to that equation.

And that brings us neatly to technology. It is clear how critical it has become to deliver top-grade fund services and meet stakeholder – namely investor – expectations. A contributor to this report describes it is as part of his firm's DNA. Yet it is widely acknowledged that many private real estate managers have been slow on the uptake of technology. There could be many reasons: cost and complexity of searching the market for the perfect product; the time and effort involved in implementing and updating software; finding the right skillset to expertly manage it all. On top of that is the mindboggling pace with which technology changes. How do you know that the systems you integrate today will not become obsolete in five years' time?

Of course, the technology journey does not end at the door of investment management firms. There is also the performance-enhancing technology in the properties in their portfolios. Some investors have spotted an opportunity to back a new breed of funds dedicated to capitalizing startups that are developing innovations specifically for use in the built environment – it is aptly named proptech investing. These fund managers and investors see a future where real estate and technology become one.

Technology is too often equated with business disruption. Throughout this report, it is clear it is time to think of it as "business-enhancing" at both the management company and asset level. The core message throughout is that if you are one of the managers yet to fully embrace technology, it really is time to step up. I'll leave you with the wise words of one of our contributors: "Adapt or get left behind."

Enjoy the report,

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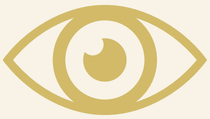
Fund services and technology: Six trends

Helen Lewer highlights the key talking points



1

Ever watchful investors

They expect information on pretty much every aspect of the investment management business – front, middle and back office. Managers' processes, systems and data management strategies are under the microscope more than ever. Yes, investors still want to know how managers are going to make good on their return expectations, but they also have an eye on operational efficiency, costs and even the skills and background of employees.

2

Regulation merry-go-round

Regulatory and rule changes globally continue to keep compliance and risk teams on their toes. And it is not just financial regulation. As one Europe-based CFO notes, it is also regulation in a plethora of other areas like data protection – the EU's General Data Protection Regulation is the most noteworthy of 2018 – and the environment. Managers cannot take their foot off this particular accelerator.

3

Keeping up with tech and data

There is a consensus that real estate is playing catch up in utilizing technology and data. That mindset is changing as firms start to see its potential in delivering a competitive edge. But there is a downside. Fraud and phishing scams are a big concern. It is essential that managers prepare themselves and take steps to protect their data. Failure to do so could be disastrous to business reputation.

4

Outsourcing gains traction

A growing number of managers are recognizing they cannot do everything in-house. Outsourcing is already popular in Europe, and there are signs of an uptick in the US and Asia. The quality and expertise of service providers is higher than ever, meaning managers have greater confidence outsourcing key tasks, allowing them to focus on what they do best: raising funds, picking assets and getting deals done.

5

The X factor

Sourcing talent is no longer just about finding the best dealmakers and skillful negotiators. Increasingly, it is about finding good operators and risk compliance experts. And, of course, tech and data gurus; some firms have taken the leap and hired these skills in-house. We are seeing the rise of chief technology and even chief data officers, but competition is high for the best tech talent, and convincing that talent to work in private real estate is a challenge.

6

Proptech investing

A new breed of investing, providing the capital to startups to develop innovative new technology specifically for use in the built environment: for example, to track consumer behavior patterns and help maximize investments in the retail space. It is on the rise as some savvy investors foresee the fusion of technology and real estate. ☐

Sticking with tradition

Managers favor familiar domiciles as they face disruptive times, say RBC's Priya Nair and Dirk Holz

Unprecedented pressures are bearing down on fund managers' operating environments due to regulation, investor demands, data and technology. Priya Nair, managing director and global head of product management, and Dirk Holz, private capital lead at RBC Investor & Treasury Services, explain the key findings of a manager survey produced with *PERE*.

Holz: not surprising that Delaware and Cayman are top domicile choices, followed closely by Luxembourg

PERE: Is choice of domicile more important now given the complex regulatory climate?

Dirk Holz: Yes. We've seen more focus, discussion and scrutiny over domicile choice in the last five years. A high proportion of the *PERE* 100 are US fundraisers, so it's not surprising that Delaware and Cayman are top domicile choices in the survey. The flexible regulatory and tax framework of these jurisdictions is a key factor. There's also been growth in fund structures based in Luxembourg, which was quick to react to AIFMD and continues to offer flexibility to private real estate funds by complying with new regulatory frameworks. The UK, Ireland and Channel Islands are the other popular European jurisdictions used to access European capital. But the UK's decision to leave the EU means there are unresolved questions about access to European investors in the long term.

PERE: Brexit terms remain largely unresolved. How are RBC's clients preparing to minimize the potential impact and how is it determining domicile choice?

DH: The impact could be significant. Many managers that before the referendum were planning to domicile in the UK to leverage the AIFM passport are now looking at Luxembourg or are creating parallel fund structures to navigate through the uncertainty. The latter approach limits the costs of establishing an EU investment management platform. However, ESMSA has warned that UK managers will have to prove 'substance' in the offices where funds are domiciled, so there's complexity on how parallel fund structures will operate post-Brexit. The risk of a hard Brexit still exists and UK managers that have not already done so need to review operational set-ups and determine what they will require to re-domicile or consider establishing a third-party management company within the EU to minimize disruption.

Nair: strong connection between domiciliation, regulation and outsourcing

PERE: Outsourcing is gaining traction in some parts of the business. What's driving that?

Priya Nair: A lot more complexity now exists in terms of fund structures and the size, scale and the multi-jurisdictional nature of managers, so the focus on creating operational efficiency is greater. There's a strong connection between domiciliation, regulation and outsourcing. The survey revealed fund administration as the most popular discipline for future outsourcing. That's not a surprise given AIFMD requires enhanced reporting, so there is a greater need to appoint a third party to help with oversight and reporting. Many of our clients recognize that fund administration is no longer part of their DNA and with market competition intensifying, asset managers are consciously choosing to focus on their core competencies.

However, part of the survey showed that aspects of the outsourcing value chain are still not part of mangers' mindset. But with the size and scale I referred to, there's more need for managers to start thinking about how best to utilize outsourcing. I do see it as a trend that will continue to grow.

PERE: How important are data management strategies and technology?

PN: Currently only one in three respondents are thinking about outsourcing technology or data management strategies. We expect to see this increase over time as these tools become more advanced, and there's greater need for investment and expertise in these areas. We've pivoted our business to focus more on digitization. There's a great opportunity for us to partner with managers to help them utilize structured and unstructured data in a manner that offers value-add to investors and to their own operations. □

Methodology

PERE surveyed the 75 largest private real estate managers. We received 51 responses: 31 are headquartered in North America, 11 in Asia and nine in Europe. Answers were given on a strictly anonymous basis and the results aggregated. Where respondents were asked to give three answers, the first answer was given three points, the second two points and the third one point. An average was then taken of the total.

The talent hunt

Staffing to meet the skills required in this tech and data-driven age is one of many new challenges facing real estate managers, write Simon Havers and Hugo Healing of Odgers Berndtson

Software has transformed the delivery of physical goods and services – think Amazon and Hotels.com – and is spawning businesses that are entirely digital and virtual. Such trends have swept across all sectors. It is now impacting real estate.

Zoopla and Rightmove, for example, have put a massive selection of property information at consumers' fingertips, and rexchange.com is using artificial intelligence to target potential buyers through social media. New technology is streamlining administration; Dealpath.com provides a workflow management tool for real estate investment teams and appearhere.co.uk runs a marketplace for short-term retail space. Co-working space providers are showing how well online booking can work and it is only a short jump from this to leasing longer-term office space online. Here are other examples of how technology is impacting real estate:

- **Providing insight**: Analytical tools to help understand the strength of a tenant's covenant; spacejamdata.com gathers consumer information allowing property owners to select and attract specific retailers to their developments.
- **Arranging finance**: Finance providers can use AI to satisfy themselves of valuations and automate the finance approval process.
- **Reducing building operation costs**: Smart building management systems and software harnessing 'internet of things' technology. EnModus enables the internet connectivity of any mains-powered device without the need for rewiring or use of unreliable wireless technology.

Finding the skills

These developments are creating a challenge for private real estate fund managers to identify the risks and opportunities arising from AI and other new technologies. The risks need to be mitigated and the opportunities analyzed and prioritized according to which will give the best return on investment of money and management time. And this requires staff with the right blend of technological expertise and commercial savvy to separate the substance from the hype.

The increasing importance of the technology function to the achievement of managers' overall business goals is leading to the creation of chief information officer and/or chief technology officer posts in organizations that previously would have seen technology as a lower-level function that would report into the chief financial officer. However, IT is no longer about simple tasks like ensuring the hardware is up and running and updating everyone's copies of Windows and Office. It is now about ensuring the organization has a technology stack that is appropriate to its business and that continually incorporates best of breed new products in a thoughtful way that keeps the organization competitive.

Below the CIO/CTO, organizations need to bring in further technology staff to the extent their size allows, to focus on specific areas such as big data analytics.

"The pool of talent with technology skills is at a premium. Those who additionally have experience of the real estate sector are rarer still"

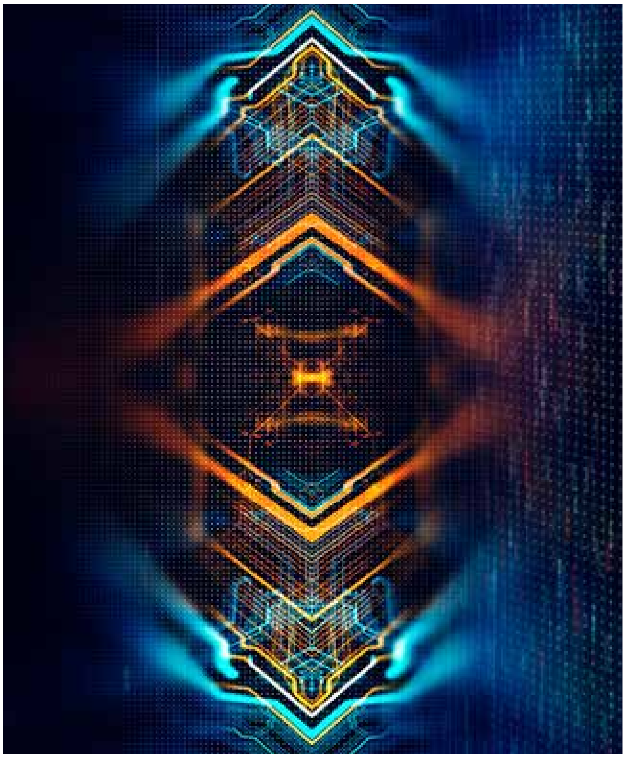
Premium pay

The high salaries commanded by individuals with these skill sets presents two challenges for managers: their direct impact on the P&L and how they can be accommodated in an overall pay structure where long-serving, experienced individuals in non-technology areas are paid comparatively less.

The pool of talent with technology skills is at a premium. Those who additionally have experience of the real estate sector are rarer still. For that reason, rather than further bidding up the salaries of that limited pool, real estate managers and investors may look to pull people in from other sectors (such as consumer), which are further down the technology adoption path. Companies looking to make these hires will find it easier to address these challenges if they are supported by an executive search firm with real-time knowledge of candidate pools and market rates, coupled with the capability to assess individuals for their ability to adapt to a new sector. □

Managing the unstoppable tech revolution

In an era of more granular investor due diligence, technology has rapidly become indispensable to investment managers. RSM's Tom Green and Brad Berkley of Artemis Real Estate Partners discuss the benefits and challenges it brings



Data and technology: now part of managers' DNA

Up and down the capital structure, from property management to investor reporting, technology is changing private real estate. In the last five years, the sector has had to absorb new products and systems quickly. Tom Green, national real estate audit practice lead for RSM US LLP, an audit, tax and consulting service provider to the middle market, asks chief financial officer Brad Berkley of Artemis Real Estate Partners how they have approached and managed the challenge and discovers how important technology and data are in responding to investor requests.

Mission critical

Tom Green: Identifying, developing, sourcing and implementing new technology and data systems takes a huge effort. For smaller managers in particular, the challenge can be overwhelming. Technology implementation is a continuous process of refinement across the organization. The evolution never stops. But there's no question that it creates efficiencies and gives managers an edge in outperforming competitors and delivering returns to their investors. What's your own experience Brad of driving technology advancements for Artemis?

Brad Berkley: Technology is critical from an operations perspective and has been part of the Artemis DNA – in asset management, investment acquisitions and investor reporting – since the company was founded in 2009. I think this is because several Artemis principals grew up working in spreadsheets, accounting software and other systems in the early 2000s that didn't interface well and as a result, the junior employees, which we were at the time, spent many late nights manually 'moving' data from one system to the other. And from that experience, we developed an appreciation – or maybe dislike is a more apt description – of the time and effort involved in completing what should have been a relatively simple task.

At inception, we intended to build a database that would incorporate information from many systems, including property-level and fund-level accounting systems, acquisition and asset management systems, and others. The goal was to have one source of information and streamline the flow of information across the business units. We have implemented a central database system that allows us to collect that disparate information electronically across our business units in a more controlled and organized fashion. In turn, we are now able to respond quickly to investor requests as the technology allows us to rapidly 'slice and dice' the data per the request.

TG: It's probably also worth emphasizing that it's critical to secure c-suite buy-in for technology. Implementation and integration is hard whether you're using a legacy system or something new and untested. It may take longer and cost more if a plan is not put in place. Management needs to be fully supportive of these types of undertakings and any setbacks along the way. But managers can't afford to do nothing; the benefits outweigh the costs.

> "Technology implementation is a continuous process of refinement across the organization. The evolution never stops"
> Tom Green

BB: Integration and building out new systems is indeed hard. The software inevitably presents its own unique challenges, which you can usually build a work around for, but getting employee engagement and company-wide adoption is really the opportunity in my opinion. This is why it's critical to have the support of the c-suite so that everyone in the company understands the importance of the project and becomes an active participant in the implementation.

Risky business

TG: The CFO's role as it relates to systems and technology involves a little bit of offense and defense. The offense being how much information can be retrieved in a timely manner to measure performance, and how accurate that information is so managers can be at the cutting edge of making the best real estate decisions possible. Then there's the defensive aspect, which is keeping on top of the new threats relating to data breaches, fraud and cybersecurity. These problems didn't exist 15 years ago. In our own business, as a service provider to investment managers, we've experienced an uptick in the support we're being asked to provide to managers on these issues. Talk to any CFO; they've been a victim.

> **"Data plays such a big role in every aspect of our business and in our relationship with investors"**
> **Brad Berkley**

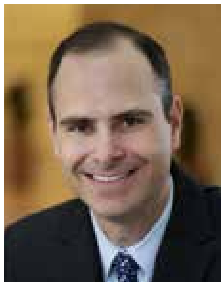
BB: We have been focused on cybersecurity as an increasingly important threat. In fact, we've incorporated periodic reviews with our IT provider into our overall risk management framework to help prevent cyber-attacks, among other things, because data plays such a big role in every aspect of our business and in our relationship with investors. We assess our network from a security standpoint throughout the year and evaluate new technologies that are available to make our data safer. Most recently, we've been concerned with sophisticated email spoofing/phishing scams and verbally confirm any changes in wiring instructions.

Investor demands

TG: There's heavy compliance with respect to cybersecurity and risk management. I'm curious to know what concerns your investors have regarding the security of their information.

Green: uptick in the support we're being asked to provide to managers around cybersecurity

BB: In our experience, investors have increased their emphasis on due diligence of managers' back office infrastructure. Say four-to-five years ago, operational due diligence consisted of maybe a two-to-three-page check-the-box type questionnaire. These days, onsite due diligence of the back office is more common. Investors often send an operational expert to the office to go through our policies and procedures on, for example, SEC compliance and accounting practices. They'll also review our IT policies and procedures. Some have even requested access to our server room to ensure it's securely locked. That was unheard of four-to-five years ago.



Berkley: technology is critical from an operations perspective

TG: It seems the burden has really increased in terms of due diligence for potential investors. Has technology made a difference in terms of making the process more efficient for you?

BB: Unfortunately, there is no industry standard template for data collection. While there are metrics such as IRR, multiple and equity invested that are consistently requested across all investors, many investors have their own unique data requests and how they want the data to be presented. We developed a technology solution to transparently and efficiently respond to the increased depth and breadth of investor requests received during the due diligence process as well as post-closing. At this time, Artemis has roughly 100 active investments across numerous operating partners and product types. So our asset management systems are collecting numerous data points for each investment, which we can in turn synthesize and push back out to the investor in a timely manner. Technology is enabling managers to meet these investor standards.

Around the corner

TG: The industry is clearly benefiting from the great technological advancements in asset management and reporting tools. Data and information are now more accurate, can be produced quicker and human error is eliminated. What do you think is next in technology in private real estate?

BB: We will continue to see advancements in how data analytics can play a role in the acquisition process. For example, our deal-tracking software can provide detailed demographics of an area by simply entering an address, and I would expect that, over time, more data points will be added to this program and eventually the cashflow forecast will be incorporated as well. It's unclear if the process will ever be a 'push-of-a-button' but you can certainly see the individual components that are available today and it's just a matter of time before everything is brought together. Utilizing technology and data to make predictions about where to build and invest, that's the next frontier for the private real estate sector. □

Creating efficiency: innovation is changing how and where we work

Five technologies set to reshape office space

By harnessing the latest systems, managers and owners can streamline operations, make cost savings and find value-add. Lisa Fu reports

Technology is changing real estate. The impact is already visible in the retail space where the rise of e-commerce is held responsible for the crisis in brick-and-mortar shops. Managers and investors are working out where value-add can be found and where to place capital. But it is not just retail assets being impacted by technology; offices are being impacted too. Here is a flavor of the technologies making a difference.

Internet of things: Greater operational efficiency

IoT is allowing office space to be tailored to specific individual tenant needs while cutting costs. Smart buildings and smart furniture can already make office operations more efficient.

With the aid of sensors, operators can keep track of how frequently conference rooms are used, maximizing office space. "Using the latest technology to improve office efficiency gives managers new ways to cut costs and focus on value-add," says Jake Edens, Colliers International's senior vice-president of technology and innovation.

According to TH Real Estate's innovation and technology strategist, Jack Sibley, tenants also want office space that offers a healthy working environment. To manage its assets and promote workplace productivity, TH Real Estate has teamed up with Demand Logic, a company providing software to optimize property maintenance for clients like The Crown Estate and Transport for London in the UK. The firm has been running trials with special sensors that keep track of humidity and temperature to ensure productivity is maximized in TH Real Estate-owned buildings, although Sibley clarifies the firm is still in the early days of implementing the technology. "We see it as part of our duty to provide spaces which promote the health and wellbeing of our tenants," he says.

> **"Using the latest technology to improve office efficiency gives managers new ways to cut costs and focus on value-add"**
> **Jake Edens**

Tenant apps: A customer-focused approach

Offices are becoming less about floor space and more about providing a desirable workplace environments. Younger workers in particular expect more than a desk at the office, observes Zach Aarons, co-founder and partner at MetaProp. To recruit and retain tomorrow's talent, companies will need to provide new office buildings, amenities and conveniences as standards change. A shift in employee office preference is going to reverberate up to property owners. It is no longer enough to just lease space. "You can't call them tenants anymore," Aarons says. "Now they're your customers."

In this respect, offices are starting to mimic hotels; more B2C focused than B2B. Improving operations is core. Within the next two years, Sibley expects flagship buildings to roll out management apps that improve the tenant experience by providing one platform to handle all needs, emergencies and communication. Tenants will report a broken elevator, reserve a conference room or place a coffee order all on one app provided by landlords. "If GPs are trying to raise a core-plus or an office value-add fund and they don't know how to implement a technology and innovation strategy, in their next fund cycle, they're toast," warns Aarons.

> **"If GPs are trying to raise a core-plus or an office value-add fund and they don't know how to implement a technology and innovation strategy, in their next fund cycle they're toast"**
> **Zach Aarons**

Blockchain: Minimizing headcount and floorspace

The technology behind cryptocurrency is likely to streamline business operations and cut down on the number of employees required to be physically located in an office. A 2018 La Salle report, *Blockchain and Real Estate*, predicts the technology has the potential to reduce back office operations in fund management companies, accelerating the trend of shrinking office space demand as headcount decreases.

Outsourcing will further exacerbate shrinking headcounts, says Mark Grinis, EY's global real estate, hospitality and construction leader. As headcounts change, the need for large offices declines, and Grinis believes tenants will no longer want to sign 30-year leases. "Companies like ours would love a three-year lease because it's hard to anticipate space needs," he says.

AI and big data: Predicting trends and tracking performance

Data collection and implementation of machine learning and artificial intelligence is already helping managers and investors to identify and predict market trends, track how office space is used and monitor performance on matters such as sustainability benchmarks.

It can also help managers and owners foresee issues before they arise, says John Gilbert, COO of Rudin Management and executive chairman of Prescriptive Data, which co-invented the Nantum building operating system.

While it is too early to deduce how this technology will impact investment return figures, Gilbert says his firm's office tenants are craving the data that has been collected. They want to know what they should be doing from a sustainability standpoint and they want to report that information back to investors and employees, according to Gilbert. Blackrock has adopted Prescriptive Data's technology by installing Nantum TF on its 52nd Street office in New York to collect data and drive energy consumption patterns down. "Blackrock is one of the leaders in the mayor's carbon challenge," Gilbert says. "They've been able to benchmark and cut their carbon consumption."

Data also allow tenants to spot trends in employee attendance on certain days of the year and to optimize office space accordingly, explains EY's Grinis.

Colliers International has invested heavily in collecting and analyzing data in recent years, says Edens. Colliers' clients are increasingly interested in the capabilities of data, whether to help with benchmarking or using past deals to spot trends and give clients a competitive edge.

"Machine learning and AI allows humans to feed data into algorithms, resulting in the computer picking up on trends and teaching itself," explains Dominic Wilson, co-founder and managing partner at Pi Labs, a leading European venture capital firm in real estate tech. "If the algorithms are correct and the quality of the data is clean and robust, then the chances of error are much lower and processes like rent reviews can be automated," he says.

Driverless cars: An end to the office parking lot

"There's going to be a transportation revolution in the next 10-15 years," says TH Real Estate's Sibley. The UK-based firm is working on scenario-testing for when driverless cars become available, potentially changing how people move around in cities and altering the need for office parking lots. "As the future becomes more uncertain, underwriting is going to become more challenging and you have to look at a wider range of scenarios every time you make a decision," Sibley says, adding that TH Real Estate is considering the flexibility of its assets.

"Flexibility means thinking about what to do with existing properties if, for example, 60 percent of the parking space becomes unnecessary and what to do if people start moving around cities differently."

Land once occupied by parking lots can be replaced with new office buildings, and the convenience that autonomous vehicles provide can lead the re-establishment of corporate campuses outside of urban city centers, CBRE Group senior vice-president of digital enablement and technology David Eisenberg suggests.

"The availability of land once reserved for parking will change supply and demand dynamics," he says. "Funds that have the best user research on the consumer impact from driverless cars are the funds most likely to outperform in the future." ◻

Omnichannelling is key to future-proofing shopping centers

Henrie Kötter, CIO of ECE Projektmanagement, explains how technology helps provide what customers want and is key to making good retail investment decisions

Disruptive technology, and the need to embrace it, has been influencing both the retail and the retail real estate sector for a while now, but it is not only the rise and growing success of e-commerce that is challenging retailers and investors. In fact, retailers – shopping centers in particular – are facing multiple challenges at the same time, e-commerce being just one of them. Other aspects include poor or outdated locations, unsuccessful product lines or the effects of an overly rapid expansion. Both retailers and investors must continuously consider how to meet these challenges.

Adopt a customer-centric investing approach

Good investment decisions are key to preparing for the future, but investors often struggle to know where to start. Which investments will make the most sense in the long term and offer the biggest bang for your buck? To get the right focus, it is critical that investors shift from an asset-oriented approach to a customer-focused approach. In other words, investments must be allocated to measures that have the greatest effect in meeting customers' wishes and improving the customer journey.

Secondly, investments must be systematic and based on a proven analytical approach. This includes comprehensive research and tailor-made customer surveys providing a deep and individual analysis of each shopping center.

One particularly important aspect of future-proofing shopping centers is digitalization. ECE's digital mall pilot project, launched in 2017, is an example of this in practice. It provides both a digital and customer-focused solution.

Enter the digital mall

The idea is that from a rational perspective, e-commerce in its current form is pretty uneconomical since many products have to be carried to the customer over long distances. This causes time and cost inefficiencies. It would be more reasonable to go the other way and deliver the products from a location close to the customer. Many products are often already situated in the vicinity of their final destination, but nobody knows where and so far there has been no integrated solution to cover it.

The digital mall approach provides a local inventory of a shopping center and makes it available for customers online. It not only helps visitors plan their shopping trips, but also to select and reserve products, and pick them up locally. It also allows products to be sent directly from the nearest center to the home when consumers – hybrid as most of them are nowadays – search and buy a product online. As price differences between online and offline shrink, shops are becoming a thing of the past, so the real advantage for the customer becomes speedy delivery. And that is a lot easier and more efficient when it is being processed from a shop nearby than from a remote warehouse somewhere in the country.

"Investments must be allocated to measures that have the greatest effect in meeting customers' wishes and improving the customer journey"
Henrie Kötter

With ECE's 200 malls under management, it is not only size, a large grid of centers and proximity to customers that create momentum for the digital mall – in Germany, for example, more than half of the population lives within 30 minutes driving distance of an ECE center – it is also having a close and long-standing network of retailers. The pilot project at our Alstertal-Einkaufszentrum in Hamburg, for example, has already started successfully, with 200,000 products available to date. By the end of 2018, approximately 50 retailers will have participated in the digital mall project. It is also a valuable source of information and experience to us for future progress: there are plans to connect several shopping centers to the digital mall platform.

Future-proofing through technology

Digitalization is a major driver for future-proofing shopping centers, and for making wise investment decisions in retail and retail real estate, as they evolve into multifunctional properties. It makes retail malls not only shopping destinations, but also leisure spots, omnichannel and logistics platforms at the same time, providing all services – and all distribution channels – along the customer journey. □

Technology solutions: enhancing the quality of reporting

How technology is helping managers bridge the reporting gap

The industry has lagged behind in deploying technology, but investment managers must adapt to the new generation of tools available, writes Scott Tavolacci, Yardi's regional director of investment management sales

The relationship between investors and investment fund managers is in the midst of change. This is in large part because the tech-savvy younger generation expects to have timely access to accurate information. Investment managers that fail to respond to the changing demands of clients will find themselves at a competitive disadvantage.

Regulation drivers

The need for accurate reporting seems self-evident, but in fact it has been a long time coming. Two regulatory-driven events in the United States have been particularly influential. The first was the passage of the Sarbanes-Oxley Act in 2002. Designed to protect investors from fraudulent accounting practices, the legislation placed new emphasis on providing accurate data to both public and private players.

In the years that followed the enactment of Sarbanes-Oxley, it often seemed that investors and investment managers could do little wrong. In hindsight, however, financial reporting was surprisingly lax. Then in 2010, in response to the financial crisis and recession, the Dodd-Frank legislation triggered a new wave of regulations and forced investment advisors to re-examine their processes and information flows.

"Investment managers that fail to respond to the changing demands of clients will find themselves at a competitive disadvantage"
Scott Tavolacci

A new age of reporting

In large part because of these two watershed events, investors today demand a greater degree of accuracy, and timeliness, of information reported to them by investment managers and more transparency in their relationships with them. Moreover, investment managers themselves are placing additional demands on property managers for information beyond a financial statement. They, too, expect timely, accurate and easily integrated information that does not need to be entered into multiple software solutions.

Investors also seek customizable reporting programs that address their specific needs and investment parameters. Fund managers that fail to heed that call, often relying on outmoded systems of reporting, risk endangering those relationships.

Hesitant start

Coinciding with the higher standards set by investors, technology solutions have emerged in recent years to bridge the reporting gap with increasing efficiency. Today, software providers offer cloud-based, fully integrated platforms designed to enhance the quality, accuracy and transparency of reporting and analysis.

In the past, many investment managers have turned to customized proprietary systems to provide the necessary reporting and help them make more informed business decisions. They have come to realize that these outdated tools are inadequate to meet today's investor demands.

There are many reasons why investment managers have been slow to embrace technology. Complexity and the cost of transferring data to a new platform is one. To a large degree, that stems from the complexity of real estate as an asset class. A single lease may have hundreds of data points to track. Moreover, property managers and the systems they use track those data points in a variety of ways.

Further complicating matters is the nature of technology itself, which is in a constant state of flux. New methodologies, such as blockchain, promise databases that are centralized, secure and interactive. It is a good bet blockchain will be the next big breakthrough in driving further reporting accuracy and transparency. Right now, the field is still in its infancy.

Once a manager has invested in a system, the hurdles to change are significant, particularly on the property side. Investment managers are bound to what they have purchased and are accustomed to, until the need for a new direction becomes unavoidable. But the heightened pressure for transparent, regular and reliable information indicates that the time for a fresh approach to reporting has arrived. For today's investment managers, the call to action is clear: Adapt or get left behind.

For managers in need of expert advice in navigating the transition, third-party providers go well beyond creating the program framework. The consultant's role includes helping clients get up to speed by aggregating and inputting data. Needless to say, any system is only as good as the data it receives, a fact that underscores the value of trust among the participants. No matter how advanced a data analysis program may be, the old principle of 'garbage in, garbage out' still applies.

Tavolacci: accurate, timely data is now available at everyone's fingertips

Embrace the future

The benefits to the investment manager of adopting newer technologies are clear. Everyone in the chain of ownership can work on the same page, utilizing the same timely, relevant data as well as analytical tools that can provide vastly deeper insights into the decision-making process. By fulfilling investor expectations of greater transparency, accuracy and flexibility in reporting, today's tools can go a long way toward securing the investment manager's place among the client's trusted advisers.

"In the digital age, there is neither room nor reason for a disconnect between investor, investment manager and property manager"
Scott Tavolacci

How do such programs accomplish that goal? Data analysis today is much more than tracking occupancy or net operating income. Rather, it engages the entire ecosystem of the individual asset and the performance of that asset as part of the larger portfolio.

Programs created specifically for investment managers provide dashboards that can be configured to dissect performance data by a variety of characteristics, such as region, sector or manager. Users can drill down through a fund to a single property or tenant, allowing investors to gauge their exposure at any level. Yardi's InvestorPlus module, specifically created for investment managers, is just one example of such a program.

Additional customizable filters allow users to measure the performance of assets against key indicators, such as cap rates, net operating income and annual return, and industry benchmarks like the NCREIF property index. Such capabilities allow investors and managers to gauge possible overallocation in underperforming categories or underallocation in hot regions or property types, providing the basis for shifts in buy/sell strategies.

These applications also provide a mechanism for data integrity and data governance through the entire ownership and management chain, while ensuring transparency. In short, everyone compares apples to apples.

Toward predictive analytics

Traditionally, the real estate industry has relied on the rearview mirror as a predictor of future performance, but history goes only so far in providing accurate forecasts. Software systems are harnessing investors' appetite for more operational data, which can be used to develop robust predictive analytics and better control over risk profiles. By leveraging cashflow forecasting models that create scenarios for properties in the acquisition/disposition pipeline, users will be able to see into the future.

In the digital age, there is neither room nor reason for a disconnect between investor, investment manager and property manager. Accurate, timely data is available at everyone's fingertips, and the reliance on cloud-based software programs will only grow as the capabilities of prescriptive and predictive analytics advance.

The implication is clear. As old models for risk management in commercial real estate investment fade away, so must many long-held beliefs. Cash may still be king, but it must now share its throne with a new co-ruler – data. □

Meet the venture capitalists funding the future of real estate

Major investment managers are opening their checkbooks, and portfolios, to a two year-old firm set on finding startups that will reshape the asset class.

By Meghan Morris

In 2016, Brad Greiwe and Brendan Wallace faced a problem familiar to many first-time fund managers: potential limited partners had little interest in their debut venture capital vehicle.

Two years and a $212 million top-performing maiden fund later, the duo face the opposite problem: handpicking limited partners to participate in their second fund. In between its two vehicles, the real estate world seemingly woke up to the vision

Greiwe and Wallace built their VCfirm, Fifth Wall, on: real estate has long ignored technology, but to do so now means it risks being left behind. Funds for sector-specific technology abound for agriculture, education and other seemingly more niche industries than real estate. The Fifth Wall founders – who each have experience in real estate and technology – identified a market ripe for disruption.

"What we saw was this massive void in the VC ecosystem, where you had real estate, which is the largest industry in the US – 13 percent of the US economy – and anyone who's familiar with real estate at all knows it's one of the least technologized industries," Wallace says. "That's true impressionistically: if you walk into a building, it doesn't look or feel much different than it did walking into that building before the dawn of the internet. But empirically, real estate is one of the lowest spenders on IT versus all other major US industries."

Interest in property technology has begun to accelerate. VC spending increased from $2.42 billion in 2015 to $1.91 billion in the first half of 2018, according to data provider CB Insights.

Wallace and Greiwe have identified a few trends driving this interest. Over the last five years, they say consumer and sector changes have forced real estate to think highertech. Across property types, landlords have adopted a more customer-centric approach to management, offering more amenities and more opportunities for tenant engagement. Existential threats – from sources few predicted – have also popped up, with Airbnb, WeWork and other startupsturned- mega-companies threatening traditional business models, though those groups own little or no real estate. In a longer cycle, real estate owners have shifted from buying low and selling high to focusing more on value-adding operations, typically enabled by technology.

And for firms of all stripes, the money now cares. Investors, boards of directors and other stakeholders are asking managers about their technology strategies. "If you don't have an answer to how technology is going to influence, enable or disrupt your business, you're going to be in trouble," Wallace warns.

Wallace and his co-founder are betting that technological trends will only accelerate, as real estate plays catch-up to finance and other sectors that began evolving years ago.

"It's in our humble opinions that in 10-15 years from now, there will be no discernable difference between a technology company and real estate company," Greiwe says. "If you're still just a real estate organization, you're going to be losing to your tech-enabled competitors." Greiwe and Wallace share backgrounds that prove their thesis about real estate enabled by technology. Both came from real estate families

Fifth Wall

Founded: 2016

Offices: San Francisco, Los Angeles

Employees: 20

Total invested capital: over $150 million in 25+ companies

Strategic investors in Fund I: Hines, Macerich, Prologis,

CBRE, Equity Residential, Host Hotels & Resorts, Lennar,

Lowe's Home Improvement, Rialto Capital Management,

Rudin Management Company

Funds: stage-agnostic, but typically targets investments

in Series A, B and C

2016-vintage Fund I:
$212 million Investment sizes:

$1 million-$12 million

Fund II: Currently in market, targeting $400 million

Investment sizes:

$5 million-$25 million

Greiwe: Invitation Homes' tech push is indicative of future VC success

and started at real estate investment banks before working with some of the largest private equity real estate companies. Later, Wallace co-founded two companies: a workforce optimization company that raised $33 million of venture capital and was acquired in 2014, as well as the largest ridesharing service in Latin America. Greiwe co-founded a Blackstone platform that relied on technology for deal sourcing and asset management: Invitation Homes, which would become a $12 billion single-family rental company.

With those backgrounds, the pair identified not only massive underinvestment in real estate technology, but also a need for corporate buy-in. An in-house corporate VC arm, however, was not an appealing option, since they had seen too many fail across industries for lack of the right talent, incentive, operations and other problems. On the other hand, corporates offered sizable portfolios in which VC-backed companies could immediately scale; deep industry knowledge and relationships; and the power to sway peers' technology adoption.

For the best of both corporate and private VC funds, the co-founders put together a hybrid vehicle, which they claim has no equal across industries. Half of the fund's limited partners are financial: Ivy League endowments, other university endowments and pensions that are investing out of a VC bucket, not out of real estate.

The other half – which invest under the same terms as financial investors – are corporates acting as both capital partners and portfolio company accelerators. These real estate firms, chosen to represent facets of real estate – Hines for office, CBRE for property services, among others – work with Fifth Wall's advisory team to evaluate the startup landscape and adopt what the groups deem the best technology. Some technology fits with just one strategic partner, but others, such as energy efficiency, can be broadly applicable, which helps widen the potential distribution funnel for the portfolio companies across the fund's investors.

Fifth Wall's proposition partly rests on these marquee names – Hines, Equity Residential and others – adopting the VC fund's portfolio companies' technologies, making them the industry standard.

Both types of investors benefit from the hybrid model, the co-founders say.

"A generalist VC fund looks at their LPs every three years and says, 'I lost money on a large portion of my deals but made a very high return on a small subset.' This is in large part because most generalist VCs are forced to speculate if certain technologies will be adopted by the market incumbents," Wallace says.

"By contrast, if Fifth Wall's losing money on a large portion of its deals, that means we're almost not doing our job, because we're in the business of not just trying to speculate or guess what the future of built world technology will be; we're tasked with knowing it or making it happen. When we invest in a company, we don't just cross our fingers and hope it grows. We're often pre-engineering growth for our portfolio companies with contracts with our strategic partners that can immediately boost revenue 4-5x. This is broadly what we mean when we use the phrase 'Kingmaker.'"

From construction to micro-mobility

The firm is making progress on its second fund, closing on $101 million against a $400 million target for Fifth Wall Ventures II in June, according to a filing with the Securities and Exchange Commission. The firm declined to discuss fundraising.

Both funds invest in Series A, B and C companies – startups that have some proven technology. By category, Fifth Wall is investing in the overall "built-world environment." That overarching term can encompass anything touching real estate, from construction materials to building systems to micro-mobility – a term used for Lime, one of its portfolio companies that offers shared bicycles and electric scooters. The firm's most recent public investment was follow-on capital for Blueprint Power, a company that helps landlords sell buildings' excess energy.

No matter the portfolio company, the firm follows standard VC underwriting practices to examine a target's financials, leadership and other elements. In addition, Fifth Wall considers three areas: asymmetric information, which often comes through corporate relationships; access, to avoid being squeezed out of funding rounds – though that has not yet occurred; and a unique ability to influence outcomes, typically based on partner relationships and the firm's embedded business development team.

Wallace: investors need to be proptech-savvy

At its outset, dealflow came from the firm or its corporate partners. Now, however, VC funds seeking out Fifth Wall have become the greatest source of deals. Wallace says relationships with generalist funds, which now look to Fifth Wall for anything built-world-related, are among the firm's strongest assets.

Portfolio company spotlight: Blueprint Power

One of Fifth Wall's recent investments helps building owners monetize excess energy

Reducing energy use is a laudable goal, but going a step further to monetize energy could be the next frontier for landlords.

Blueprint Power, Fifth Wall's most recent investment as of press time, is betting it can bridge the landlords that generate excess energy through sources such as solar panels and the entities that could buy power. The New York-based startup, which raised a $3.5 million Series A financing round in late July, has built technology that uses machine learning to both manage the use of generated energy and to predict consumption needs and sell excess energy.

Claiming a $400 billion opportunity, Fifth Wall joined a group of investors for the Series A including proptech-focused MetaProp Ventures, sustainability VC-focused Congruent Ventures and two partners at VC firm Union Square Ventures. The startup also overlaps with Fifth Wall corporate partner Lennar: Blueprint Power co-founder Robyn Beavers came up with the idea while working at Lennar, the company acted as a founding investor and Lennar's president sits on the startup's board.

Blueprint Power envisions buildings of the future serving as next-generation power plants, with smart energy management systems, onsite generation and energy storage.

Renewable energy: revenue generator of the future

'A less risky endeavor'

Houston-based Hines, which oversees $111 billion in assets, works with Fifth Wall to identify opportunities for its office-focused portfolio. Even if its fund investment does not perform well, the Houston-based firm gains knowledge and partnerships, says Charlie Kuntz, the firm's head of innovation.

"We're trying to utilize our own capital for strategic reasons in this area. It's much less about creating substantial returns. The amount of capital we're talking about that we're focusing on in this space compared to our broader real estate portfolio is quite small, but the effect that those kinds of investments and partnerships can have on our portfolio could be much greater than the investment we're making into the tech itself."

Fifth Wall opened access to the full startup ecosystem, which Hines could not access on its own. Without Fifth Wall as an intermediary, engaging with startups is "a risky endeavor for us," Kuntz says, noting Hines' background is not in venture capital. Startups benefit from the partnership, too. Engaging with Hines directly without the Fifth Wall intermediary would be "way too cumbersome for these startups" because of Hines' institutionalized nature.

Hines identifies what problems it wants to solve or what it wants to create, then liaises with Fifth Wall to create a request for proposals. Hines evaluates respondents based on operations and quality, while Fifth Wall evaluates candidates from a financial perspective. Once the firms agree on the best candidate, Hines works on implementation.

"It's incumbent on us not just to enable our strategic partners by identifying technologies that allow them to do their existing business better, but it's also to challenge them, in terms of bringing them ideas that might disrupt, dismantle or even re-invent some of their existing business lines or open up new business opportunities altogether that they may have never considered before," Greiwe says. Kuntz adds that the partnership also benefits Hines's investors, which are increasingly focused on technology.

"It's coming up more and more with our capital partners," he says. "I think that more and more investors are frankly trying to decide for themselves whether they want to be proactively engaging in real estate tech or if they want to lean on their operating partner to figure it out. We're seeing some institutions that are interested in what we're doing because it makes them feel more confident in partnering with us. Others are interested in what we're doing because they're thinking about getting into it themselves."

Fifth Wall's Wallace sees ever-increasing interest from investors, not just from those that manage their capital, in technology. "If you're an asset allocator, seeing these trends and frankly being at the forefront of them is increasingly important to you because you have an increasingly competitive real estate capital market," he says. "So being forward-looking gives you an edge, especially as it relates to the creation of these new tech-enabled real estate concepts."

Working with fund managers

Fifth Wall's model benefits more than solely its investors, its co-founders say. They have been approached by all the largest private equity real estate managers interested in technology and insights, including what the next big technology-enabled real estate investment opportunity, like Invitation Homes, could be.

As traditional managers have these conversations, the lines between a private equity real estate fund and a VC fund are already blurring. Blackstone, for example, invested $3.3 million in portfolio management software VTS in 2015, using capital from its eighth opportunistic fund. In a $15.8 billion fund, that investment barely registers – but it indicates a shift in strategy from a traditional fund mandate.

Fifth Wall is also investing in portfolio companies with heavy real estate needs, which could lead to opportunities for managers to provide what they already know: buildings. Clutter, a company that raised Series C financing last year from Fifth Wall and generalist tech VC firms such as Sequoia Capital, is one example. The firm transports customers' items from home to a remote, underutilized industrial property, rather than a purpose-built self-storage building in a city center.

Homebuilder Lennar's investment management subsidiary, Rialto, also found an opportunity beyond Series D financing to work with portfolio company Opendoor, which buys single family homes from individuals. Rialto provided a mezzanine capital investment, which created an inventory line for Opendoor to buy housing stock at lower capital cost.

Expansion plans

As Fifth Wall continues expanding its startup reach, the firm is also broadening its investor base, looking to grow both the number and the caliber of strategic investors.

Adding strategic investors internationally should help broaden portfolio companies' reach, because the bulk of Fifth Wall's investments to date have been North American-based startups that are now looking to expand abroad. The firm is also working with real estate investors for the first time in its strategic investor pool. Wallace says his team typically talks with both the head of real estate and the chief investment officer for such groups.

"The bigger the asset allocator, the more important this collision between real estate and technology seems to be for them," he says.

"This is very, very top of mind because anyone that's allocating billions or tens of billions into real estate capital markets recognizes that they cannot be caught short-handed when the first true real estate assets or real estate portfolios tokenize and start to trade on blockchain. That's going to be something any asset allocator has a point of view on."

> **"If you don't have an answer to how technology is going to influence, enable or disrupt your business, you're going to be in trouble"**
> **Brendan Wallace**

Fifth Wall is also broadening the very definition of what proptech encompasses.

"Looking to the future, our investment strategy will both include the obvious opportunities that we can all agree on is real estate technology, but it will also include situations where we can accelerate the growth of any business through real estate distribution and relationships," Wallace says.

The duo is confident that value proposition will be even more important if and when the market turns.

"I think in the next downturn, most real estate organizations, knowing full well that trend has taken hold, are going to be looking to double down on technology or enter the space for the first time with the intent of coming out of that downturn stronger, faster, leaner, more tech-enabled by accessing this space in ways they hadn't before," Greiwe says.

Even though the firm hasn't yet turned three years old, Fifth Wall plans to be the trusted advisor to help these firms weather those storms.

For now, just like any fund manager, its focus is on raising capital and putting it to work. Rather than buying, fixing and selling buildings, though, they're planning to shape the future of real estate and technology as they go. □

Protection v transparency: How much data is the sector willing to reveal?

Digitization is driving greater transparency, but for some market participants there may be more value in data opacity, observes Audrey Klein, managing director, international institutional clients at Corestate Capital Group

Digitization is now a core aspect of modern corporate strategies. Data collection and pattern analysis also play an integral part of everyday business at a real estate company. The industry is becoming more professionalized in this regard, despite still lagging far behind many other sectors.

Big data analytics and blockchain are mostly at nascent or even theoretical stages in the industry. Artificial intelligence, on the other hand, is the most widely used technology and can be found in smart buildings, most often in applications related to energy consumption.

Sensory technology installed in buildings can enable a forecast of maintenance and energy costs, help determine fire and security risks as well as user preferences. This particular market is expected to grow to $18 billion by 2020. Another AI application in use is automated transactions, which are allowing due diligence processes to be significantly shortened by applying AI such as Natural Language Processing, which helps review documents and draft contracts.

Intelligent cashflow optimization is another example of AI in action: in this case it helps determine the ideal match between potential tenants and a certain property and therefore creates more accurate price points.

Data transparency is good news for investors

The collection and processing of data holds a lot of potential for players in the real estate industry. From an investor perspective, more detailed data means a better understanding of the market, user preferences and the investment itself.

Interestingly, the move towards larger data pools is driven not only by investors wanting to optimize their business strategies but also by the regulator.

Take, for example, the implementation of MiFID II, which requires fund managers to collect and provide all sorts of new data on fund cost, target markets and target clients. To invest in a specific product, managers must have information about an investor's concrete know-how or how risk-tolerant that client is. An end to the requirement of more detailed and granular reporting of data is not in sight.

Maintaining a competitive edge

With the increasing availability of data comes not only a professionalization of each individual company but also of the entire industry. Industry standards, for example on sustainability performance, can be set through initiatives such as GRESB. Here, real estate owners share their property performance data and benchmark them against the competition.

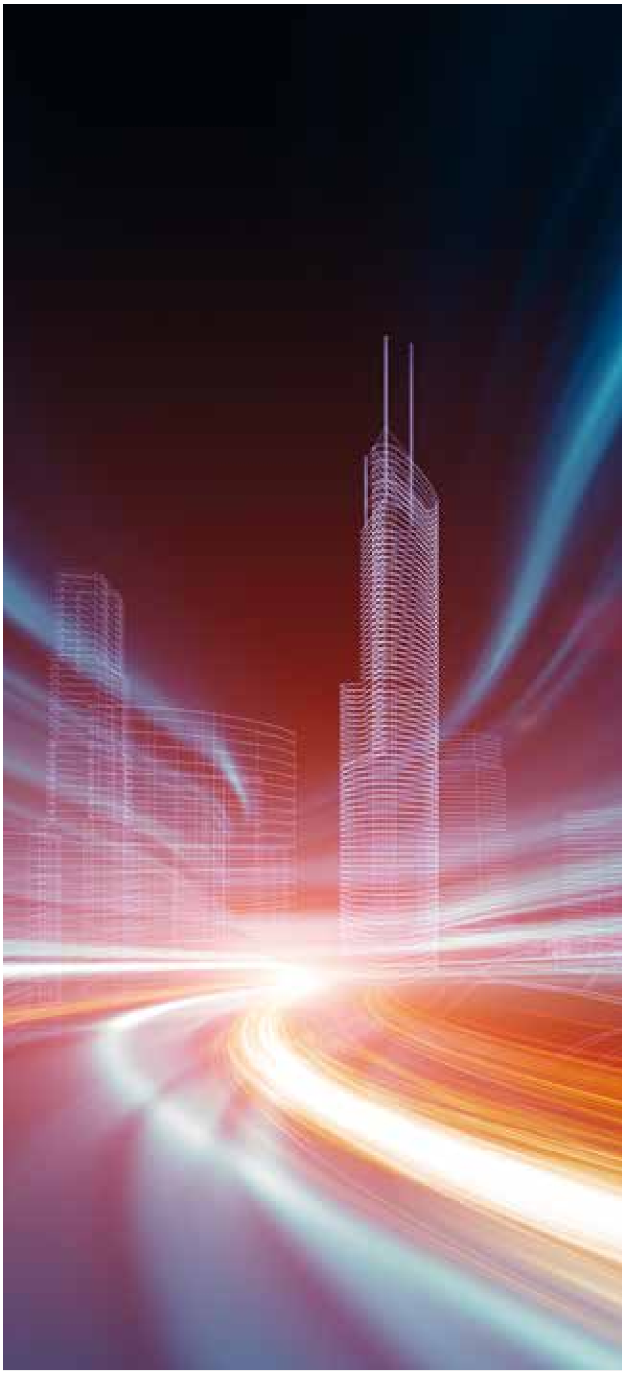
While this greater transparency is certainly attracting other investor groups to the real estate industry it also has the potential to threaten business models.

As data has emerged as the most valuable resource – data miners such as Alphabet (Google's parent company), Amazon, Apple, Facebook, Microsoft and Tencent are now the six most valuable listed firms in the world – property companies should be cognizant of the data they keep and be mindful of its confidentiality. It is crucial that companies focus on the important area of risk management and compliance to protect their customer, asset-related and employee data, and consequently act in their best interest and with integrity.

Any exclusive information a firm can gather can contribute to a competitive advantage, while readily available market data levels the playing field for all. Many companies in the real estate sector – fund managers and investors included – are happy to live with a certain opacity in the market to protect their competitive edge.

"Many companies in the real estate sector – fund managers and investors included – are happy to live with a certain opacity in the market in order to protect their competitive edge"
Audrey Klein

The real estate industry may be behind on embracing the latest technology and data schemes, yet may be a step ahead in protecting the most valuable asset outside the properties themselves: its data. □



Operational efficiency: good processes are essential

All systems go

Driving efficiency in the fund management world is not just about improved IT, but also getting the underlying processes right, argues EY's Kai Braun. By Stuart Watson

Over recent years investment managers have put systems in place that comply with the European Alternative Investment Fund Managers Directive (AIFMD). Now, a second wave of organizational reforms is underway as they adapt their processes to place ever-increasing amounts of institutional capital more efficiently across a wide range of jurisdictions and sub-asset classes, says Kai Braun, alternatives advisory leader for Europe at professional services firm EY.

***PERE**: What is driving the need for greater efficiency among fund managers?*

Kai Braun: Because of continued low interest rates the big institutional investors are increasing their allocations to alternatives including real estate. That means asset managers need to develop their capacity to raise bigger funds, sometimes several at once, with assets located across a number of different European countries. Meanwhile, more traditional fund managers that have previously concentrated on stocks and bonds, as well as hedge fund managers, are also going into these areas, so they need new operating models to enable them to do so efficiently.

In a nutshell, more cash is being allocated to alternatives and a broader spectrum of alternatives is being managed by a greater variety of investment managers. That is coupled with the fact that the environment has been more regulated for a few years now, and managers that initially saw regulation as a burden are now turning their attention to how to operate in a more efficient way in the new environment. Meanwhile, margins are being squeezed and driving performance is becoming more difficult because higher asset values make it harder to achieve a good rate of return. All of those factors make it essential that managers have the right operating model in place.

***PERE**: How are managers adapting to the need to work across national borders?*

KB: A lot of the larger players have offices in several European jurisdictions and they are increasingly aiming to align those platforms on a European level. One reason for that is the simple desire for efficiency – they want to do things the same way across their organization – but they also want to work as one European manager with an international brand. Being aligned means ensuring regulatory and tax compliance across national boundaries, while ensuring things such as that all underlying special purpose vehicles are properly structured and managed over their lifetimes. Those challenges have been around for a long time, but they are now high on managers' agendas.

There is also an issue around regulatory uncertainty. In

Braun: it's essential that managers have the right operating model

each jurisdiction each regulator may have a slightly different view on AIFMD. Meanwhile, in some countries there are pre-existing local rules. If you align on a European level to a European standard then your processes should all be the same, but where there are regulatory differences between countries you need to add an extra loop within your process to capture those.

In addition, fund managers are increasingly operating across a number of different sub-asset classes: they might be investing in private equity, real estate and real estate debt at the same time. That requires them to take a view of operational efficiency that includes each of the sub-asset classes and the way that processes play out across the different aspects of the business, for example in valuation, so that people in different parts of the company have access to the same level of information.

***PERE**: Why is it so important to get operational processes right?*

KB: Where something in a process doesn't work, so that it requires costly and sometimes exhausting intervention by human beings, then you have an organizational pain point. One classic example of a pain point is where a fund receives lots of invoices and the manager needs to be able to identify to which entity those should be allocated – at the fund level, to the SPV or to the operating company or property. Tasks like that can be processed in a semi-automated way so that when an invoice is received by any entity within the structure there are well-defined allocation rules and certain payment instructions are triggered automatically that only need to be validated.

Automation and improved IT can help to tackle problems, but the prerequisite is to first have the right process in place. To really understand how things should be done you can apply the 'RACI' matrix to determine who is responsible, who is accountable, who is consulted and who is informed. That focus on process is even more important in international businesses where you need to achieve alignment.

You can have organizational pain points as well as process-driven ones. Pain points created by the way the organization is set up might require reorganization – for example, you might want to centralize certain functions within a single European jurisdiction.

"Having the right organization and IT systems is a prerequisite for survival and for success in this market"
Kai Braun

***PERE**: Is improved technology the answer?*

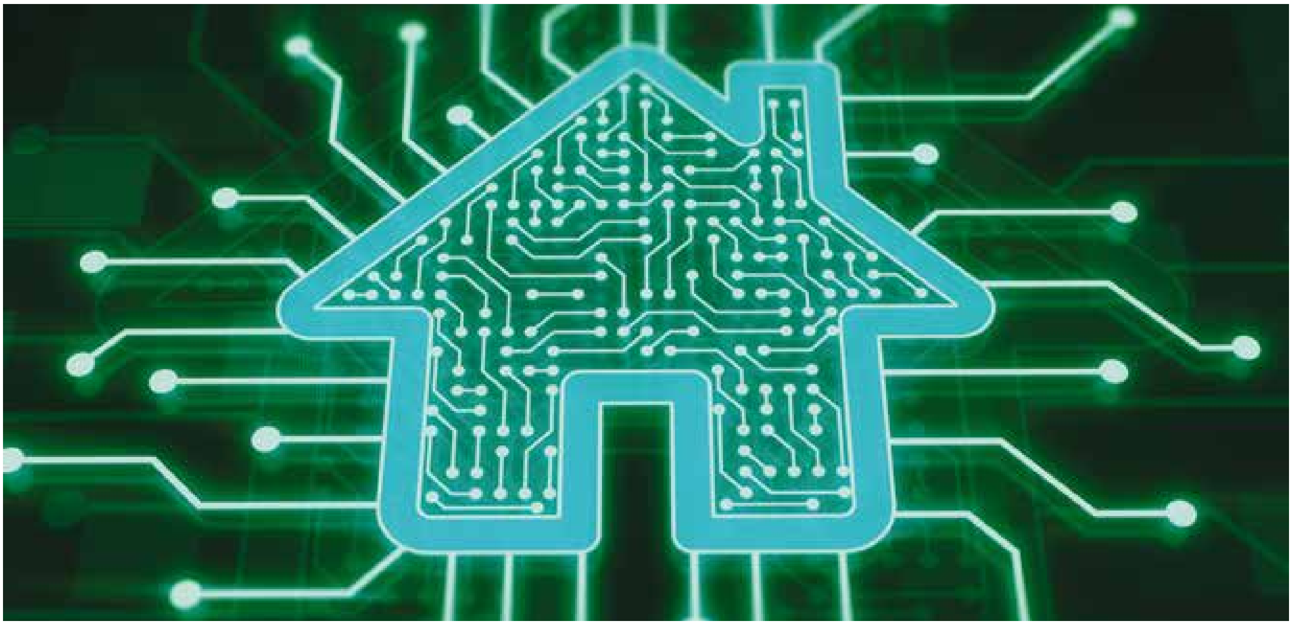
KB: The prerequisite for bringing in new IT and technology solutions is that they need to be based on the right operating models organization-wise as well as process-wise, because by carrying out IT changes in an area that is broken already you are wasting money and resources. There are two types of major IT enablers managers are looking at now. The first is enterprise resource planning for IT packages, which are front-middle-back office systems that allow the manager to run their business in a fairly standardized way and to move away from using things like Excel spreadsheets and sending around emails. Those packages allow for proper process and workflow management, so you can see who is carrying out certain tasks or approving them. That can help an organization improve the way in which its people are complying with processes.

The other is smart technology solutions like robotic process automation and artificial intelligence, and we increasingly see those coming into real estate. Sometimes a manager has to read through hundreds of pages of contracts out of which they are maybe looking to gather 200 data points. That process can be automated nowadays. Some payments can be automated too. Sometimes those systems need to be built and more managers are now hiring chief information officers from other industries and bringing them into the real estate and private equity world to build out their IT environments.

Big data is being used more extensively, too, but it requires a single source of truth. At the moment, managers often have three different values for the same data point because that data comes out of three different systems. Managers and service providers are now working to make sure when they build a data lake, all the data are correct. Then it can be used much more extensively going forward for actual management tasks like valuation, and not just for back and middle office operations.

People are always talking about disrupters of various kinds – distributed ledger technology disrupting depository banks and so on – and there is a fear of disruptors. However, none of them are really disrupting businesses; in fact, they are business-enhancing. They are not creating something totally new, but they are creating something better. The managers tackling these issues today will have a competitive advantage tomorrow.

Of course, the question remains of how long the market will continue to grow, but right now funds are raising tremendous amounts of money in lots of sub-asset classes, so managers need to make sure they can cope with that volume of capital. Having the right organization and IT systems is a prerequisite for survival and for success in this market. □



Good match: investors see opportunity in tech for the built environment

Finding the keys to proptech

As property technology moves into the mainstream, investors are discovering how to best access the space. Meghan Morris reports

From writing checks for a few thousand dollars to soliciting external capital for nine-figure venture funds, investors' approaches to investing in property technology vary as much as the startups seeking capital.

Interest in proptech investments has ballooned, from $2.42 billion in 2015 to $1.9 billion in just the first half of 2018, according to market intelligence company CB Insights.

Despite the increase in dollars and interest, a few holdouts remain. One chief executive of a US-based investment manager that raises billion-dollar funds admits to *PERE* that his "leanly staffed" firm "probably should be doing something in the tech space – maybe we will after the next fund closes."

Balancing these reluctant investment managers are the groups – investors and investment managers – betting big on proptech. Some, such as the California State Teachers' Retirement System, are in early stages of evaluating how it can fit their platform. At CalSTRS' July meeting, the real estate team included proptech in its 2018-19 fiscal year business plan: "Recognize the growing effect technology has on our industry and seek out relationships to engage and profit from it."

Groups further along in their proptech investment strategies offer roadmaps to the various options for accessing the space.

> **"If all you are is capital, you probably won't see any of the good transactions"**
> **Stewart Upson**

Becoming VC investors

Some managers are looking to proptech-focused venture capital firms for access to dealflow and, in some cases, strategic partnerships. Los Angeles-based Fifth Wall has collected capital from Hines, Rialto Capital Management and Prologis, among other major real estate companies, for its debut $212 million VC fund.

Charlie Kuntz, Hines' head of innovation, says the Houston-based manager decided to become a strategic partner with Fifth Wall to receive advisory services from the VC firm after committing to Fifth Wall's first fund. While Hines may eventually invest in proptech on its own, Kuntz says the firm can access more startups through Fifth Wall's connections than the manager could without the VC bridge. Hines' primary fund investing goal is gaining knowledge and partnerships, not financial returns.

"Frankly, we don't think deploying our capital into the space is the strongest component of what we can provide to new companies," Kuntz says. "It's working with them to say, 'We're a large industry incumbent that is open to trying new things.' Just by saying we have this broader book of business that we can offer, it tends to be more powerful. We want to try

Upson: Brookfield proving its thesis

new things, we want to do pilots, we want to find new ways to improve our projects. That open platform is often more powerful than capital. The investment is done to create a proper partnership and alignment."

Hines executives also sit on advisory boards and mentorship groups for other proptech-focused VC funds and programs.

Other groups go it alone, building internal teams with the expertise to access investments and deploy capital as opportunities arise.

QuadReal Property Group, the real estate arm of British Columbia Investment Management Corporation, is making seed and equity investments in proptech and real estate operating companies, chief executive Dennis Lopez tells *PERE*.

QuadReal's recent investments include seeding project management platform Honest Buildings and joining the fundraising rounds for shared work and conference space provider Convene and co-working company Industrious.

Earlier this year, the investor also partnered with Microsoft and the city of Toronto for urban pilot program UPPlift: Toronto, which seeks to improve the city's livability through technology. QuadReal and the city picked "smart city innovations" to pilot in their properties.

"The investments we have made in the two years since QuadReal's launch are only the beginning of what we intend to invest," Lopez says. "While there are many benefits to investing in proptech, for us it all drives toward three objectives: distinguish the service and experience we offer tenants and residents, enhance asset value and improve the resiliency of our investment returns."

In-house platforms

Some firms are building up capabilities to execute proptech investments in-house, through corporate VC funds and specific platforms. Property services company JLL, for example, launched the JLL Spark Global Venture Fund in June to invest $100 million of balance sheet capital in early-stage companies, *PERE* reported.

Investment sizes range from a few hundred thousand to several million dollars and, at launch, the fund had already made two investments, says Mihir Shah, JLL Spark's co-chief executive. He notes the fund allows JLL to invest globally across categories of commercial real estate-focused startups, as well as build relationships with the startup teams.

"In this space, startups have had a hard time with deployment cycles because people are slow with technology adoption," Shah says. "On the other side, you have JLL's clients and services. It's clear there are a lot of technologies coming on board and this helps them understand how to invest. We see the fund as the bridge between the two groups."

In March, Spark acquired Stessa, a software-as-a-service real estate technology platform created to help investors track, manage and communicate the performance of their portfolios. In the future, Shah says Spark may acquire other existing operating businesses, in addition to its investments through the proptech fund. The platform is evaluating a few companies that may also fit with JLL subsidiary LaSalle Investment Management, though most of Spark's investments are tailored to the parent company.

Meanwhile, some alternative investment managers, including Brookfield Asset Management, are tacking on venture platforms, rather than funds, to invest their own capital. *PERE* knows of at least one other private equity real estate firm set to take the same approach later this year.

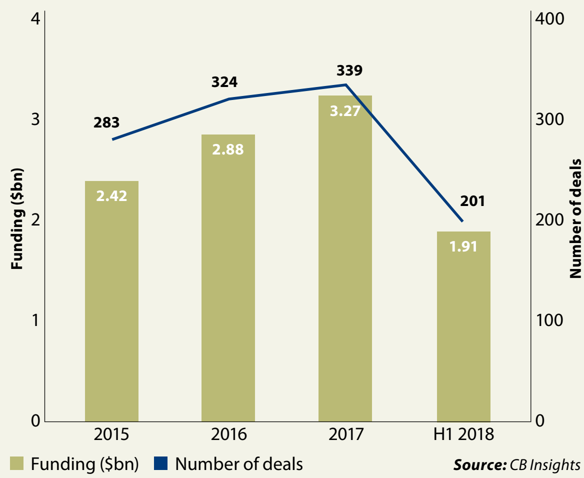
Brookfield Ventures was set up earlier this year to invest $200 million-$300 million of firm capital in technology companies raising Series B and C capital that complement the parent company's real estate, private equity, infrastructure and renewable power platforms.

As of early August, Brookfield Ventures had closed two investments totaling $70 million and was close to wrapping up its third deal, a pace that Stewart Upson, the firm's chief executive of Asia-Pacific, says is ahead of expectations. Josh Raffaelli, formerly at technology-focused private equity firm Silver Lake, leads the venture platform out of Silicon Valley, supervising four generalist investment professionals.

Like other asset managers' models, Brookfield Ventures is

Tech ticks the box

Funding to property technology companies is rising



Source: *CB Insights*

Mei: early technology investor

predicated on integrating and proving technology within the firm's alternative investment portfolios. Upson says that differentiates Brookfield's capital from a generalist VC fund.

"There's no shortage of capital for this market," he says. "If all you are is capital, you probably won't see any of the good transactions... In our relationships, capital or expertise, we can make a big difference to that early-stage venture. We've found we've been really welcomed by the companies we've invested in."

After eight to 10 successful deals, Brookfield Ventures could become Brookfield's fifth vertical – venture capital. Among Brookfield's 500 LPs, disruptor technology is a "constant topic of discussion," Upson says.

"We're making sure we've proven the thesis and we've tested out that we can fully translate our core asset skills into the venture space before we start taking on third-party capital."

Investing third-party capital

Singapore-based GLP took Brookfield's approach in investing balance sheet capital starting about five years ago, chief executive Ming Mei tells *PERE*. GLP, which manages about $50 billion in industrial real estate, sought to make facilities more efficient for its management and customers. The firm saw a need from the confluence of decreasing technology costs, increasing labor costs and growing consumer preferences for fast delivery.

"We didn't think that big at the beginning," Mei says. "We thought we should risk our own money to understand how to help our investors be more efficient."

GLP invested about $300 million of its own capital in 30 companies, using its portfolio as a testing ground for the proptech companies. As the firm built an innovative reputation, some of its institutional investors asked for advice and, later, to invest alongside GLP. These reverse inquiries led the firm to form its first private equity fund, Hidden Hill Modern Logistics Private Equity Fund, this year to scale the business.

Anchor investor China Postal Capital was one reverse inquirer. The company, which oversees China's largest fleet and facilities, wanted to learn best practices and adopt new technologies with GLP's guidance.

GLP has raised 10 billion yuan ($1.6 billion; €1.3 billion) so far for the private equity vehicle and may add a US dollar sleeve, also driven by reverse inquiries.

The firm continues to use balance sheet capital to back ventures outside of the private equity platform, particularly if it does not see a clear exit strategy. GLP is also working with its US executives to make "small investments" in the US and Japan, Mei says.

Looking forward, "we think that we are just getting started in this area," he says. "There is a lot more that could be done." □

VC firm tacks on real estate

While property technology investments are more popular, some venture capitalists are entering traditional commercial real estate

As more real estate companies eye technology investments, a small slice of the venture capital world is starting to look at brick-and-mortar strategies.

In July, a pair of Hines executives, Starling Cousley and Clint Myers, left the investment manager to build out a real estate business at VC firm Revolution. Cousley, formerly a fund manager for Hines' value-add and core-plus platforms, and Myers, previously Hines' chief strategy officer, will be charged with launching a direct real estate platform focused on investing in office, multifamily and retail properties in secondary US cities.

Washington, DC-based Revolution was founded in 2005 by Steve Case, the co-founder of AOL, to invest in technology hubs outside the East and West coasts. The firm manages funds for growth, venture and seed-stage investments, with investors in the seed fund including Carlyle co-founder David Rubenstein, according to its website. Revolution has $1.3 billion in assets under management, a spokeswoman said.

Previously, Revolution invested in real estate indirectly, taking part, for example, in a Series D funding round earlier this year for shared meeting and workspace provider Convene.

Cousley says that he and Myers had spent the last three years specifically focused on learning about the US's non-gateway cities. Last year, the pair connected with Case and JD Vance, the best-selling author of the rural America-focused book Hillbilly Elegy and Revolution's managing partner of its Rise of the Rest Seed Fund. In meeting the executives, Cousley said he found common ground between his real estate vision and Revolution's non-Silicon Valley VC approach, as the new direct real estate business would help make such markets more attractive for startup and growth firms.

More data, more problems

Buildings are filling up with digital devices that see, hear and remember everything. Dror Poleg, of Rethinking Real Estate, asks whether the sector is ready for a privacy scandal

Earlier this year, GPIF, the world's largest pension fund, published a report on the importance of ESG in fixed-income investment. It concluded that lending to or investing in companies that do not operate according to high ESG standards puts reputation and bottom line at risk.

In July, Facebook lost $119 billion in market cap in a single day. The loss was partly due to Facebook's lack of transparency on how it collects, uses and shares customer data. Facebook found itself entangled in a political and legal scandal that impacted its financial results. In the last 12 months alone we have seen breaches or controversies regarding the use of data at Google, PayPal, Instagram, Equifax and even the UN.

Privacy fears

Privacy concerns are not restricted to the online world. There has been an explosion of investment in real estate technology, led by new and established venture investors such as Khosla Ventures, Andreessen Horowitz, Sequoia Capital, Fifth Wall and MetaProp, and also private equity firms like Blackstone, Brookfield and Warburg Pincus. Even LPs such as Temasek, GIC, Caisse de Depot and TH Real Estate are investing directly in this space.

As a result, the physical world is being filled with new data-collection devices: security cameras, sensors to detect meeting room usage and building amenities, NFC and Bluetooth beacons, voice-activated devices and appliances, air quality sensors and access control systems. These devices create vast amounts of data, and many also share that data with other devices and other cloud-based databases.

Advances in machine learning and artificial intelligence mean this data can now be used to extrapolate specific personal information. Security camera footage, for example, can be connected to software that identifies people's faces, their moods, what they hold in their hand. Such software can even estimate the income level, education level, race and the sexual preference of people based on their clothing, facial features and body language.

In July, Cadillac Fairview, a wholly owned subsidiary of Ontario's Teachers' Pension Plan, was in hot water after media reports that information panels in its shopping malls clandestinely photographed visitors and assessed their age and gender through facial recognition software. In March, recordings from an Amazon 'Alexa' voice assistant were used as evidence in a murder case in the US. Devices of this kind are now being installed in hotels, office buildings and residential communities.

Privacy concerns are not restricted to consumer-facing devices. In China, urban police are scanning sewage in order to locate areas with increased drug use. In NYC, local authorities have been cross-referencing data from various databases to identify commercial tenants that are clogging the city's sewage with cooking oil. And in Canada, Google's parent company announced plans to "create a new kind of mixed-use, complete community" in Toronto, bringing its advertising billions to bear on the infrastructure of a whole city district.

"Institutional investors and managers would do well to get a clear understanding of how data is used in projects they own and operate"
Dror Poleg

Managers and investors beware

Over the next few years, there will be a dramatic increase in the amount of data collected from real estate projects. End-users will likely become increasingly concerned with how this data is being collected, stored and shared. This can lead to anything from reputation and financial damage to new regulation and compliance costs.

Institutional investors and managers would do well to get a clear understanding of how data are used in the projects they own and operate, and develop guidelines for the integration of new tools and technologies in the future. □

Stay focused: it's important to keep an eye on data usage

Relieve the pressure

Outsourcing has changed considerably over the last 10 years and continues to evolve as managers face more external pressures. Alter Domus' Anita Lyse and Alan Dundon discuss current trends

A decade ago the fund administration industry was fragmented and without specialized systems, providing little incentive for managers to outsource. The period since has seen significant change in systems development, vertical layers of services and geographical integration. Many administrators can now offer a level of service that managers simply are unable to deliver in-house. Investor demands for greater transparency have also increased with ever more pre-investment due diligence checks. This is leading to significant additional investment spending by managers to demonstrate high-end institutional quality administration as part of their fundraising process. Anita Lyse, head of real estate, and Alan Dundon, global relationship leader, of fund services firm Alter Domus discuss the global outsourcing market.

***PERE**: What are the demand drivers leading managers to outsource ever more work to third-party service providers?*

Alan Dundon: Regulation, especially in Europe, although we're also seeing it in the US and Asia. As the regulatory environment grows more complex, it becomes an administrative burden. This is driving more managers to outsource.

Anita Lyse: Managers have access to a better pool of third-party partners today, service providers are more specialized and as a result managers have greater confidence in outsourcing. For real estate managers, specialism is important because it is such a local business and support is required in multiple locations.

AD: The requirement for better technology and data management services is a factor too. Managers require vasts amounts of data to explain investment performance. This is a complex task and outsourcing to a third party with the people, systems and processes to do that can relieve some of the pressures. Clients are investing a lot on front-end technology to analyze performance and make sensible investment decisions, but they are looking to third parties to help manage the data and do the number crunching.

Dundon: marked shift toward outsourcing middle office functions

To outsource, or not to outsource?

Key questions managers need to consider

1. What is unique to your business and generates a competitive advantage, and can you maintain this in an outsource model?
2. Which tasks generate the most volume of work? Of these tasks, which are considered strategic versus outsourceable?
3. Would you benefit from the process, operating model and system capability of a third party?
4. Do you have business, and the need for local operations, in multiple locations?
5. Do you have the capacity and support to continue to invest in in-house administrative resources, and in-house and third-party software and systems infrastructure?

Source: *Alter Domus*

Managers are using data to differentiate themselves in the market and investors demand it to understand managers' performance when making decisions on reinvesting. This need is greater than in the past.

AL: First-time and smaller managers need to consider if making heavy investments in technology is cost efficient or if they're better off relying on the systems and infrastructure of a service provider. For the majority, it's the latter. Even larger managers that have invested heavily in in-house technology are relying to some extent on service providers too. Many are finding existing systems are becoming obsolete and they want advice on next steps in their tech journey. Do they invest again with a long implementation phase or do they go back to leveraging off the technology of a service provider?

***PERE**: Has outsourcing moved on from simply supporting managers' 'back office' functions?*

AD: The core functions outsourced remain accounting, reporting, tax and regulation compliance, but there's been a marked shift in the last three or four years to outsourcing middle-office and value-add type functions that require a level of specialism from a third-party partner. Treasury management,

Lyse: service providers today are more specialized

transaction support, performance calculations and carry scheme administration are good examples of this. For now, it's primarily back office with growth in middle office support.

AL: A key reason for the shift to more outsourcing up the value chain is the greater availability of more specialist providers in the market offering managers knowledge and support in particular areas. The new external pressures we've highlighted on finance and operations teams means these parts of the investment and fund management business are getting larger in scale to the point where they're often bigger than deal teams. That generates discussions at board level about where time is being spent and what the business should be focusing on. Many spend too much time on finance functions at the expense of asset selection. Those discussions often culminate in deciding to outsource not only back office, but middle office functions.

***PERE**: Is the evolution in outsourcing geographically uniform?*

AD: There are three very different stories. Outsourcing in Europe is more developed. There's logic to that. In the EU there are 27 countries, each with their own national regulations, practices and cultures. That's challenging for managers investing across the region. There is almost no choice but to outsource. In the US, there are slight differences between states, but language and laws are basically the same, so it's no surprise there's less outsourcing, but it's accelerating because of increased regulation, investor demands and the need to understand performance. Many managers in the US are at a size where they need to start looking to third-party partners. Asia is smaller scale; historically managers have had access to cheaper resources and could do a lot in-house. Outsourcing was the expensive option. But some bigger players in the region are looking for the knowledge and the expertise of the outsourcer. Asia will continue to evolve.

AL: Outsourcing levels among real estate managers in Europe are around 70 percent compared to 30 percent in the US, but that is expected to increase to 45-50 percent in the next couple of years. A challenge we might see in the US is many large managers looking to outsource at the same time in a market with a limited number of good providers. There's going to be capacity issues at some point.

***PERE**: What does a good partnership between manager and provider look like?*

AD: There's no one-size-fits-all approach. It's about identifying each client's needs and building a partnership model around that. CFOs and COOs are now very proactive at mapping out what they need to deliver to their investment teams, investors and regulators, and what can be provided through outsourced relationships or handled internally. Ideally, the service provider will have a single point of contact at the manager.

AL: Clients want to ensure their provider understands their specific asset class at all levels. They want a vertically integrated model where a single provider has the expertise, knowledge and specialisms to provide a service throughout the value chain and across multiple locations. Breadth and depth of service is required. Smaller managers and startups with ambitions to grow will want a partner that has the capacity to grow and build their business with them.

AD: It's also important for manager and provider to agree what their relationship will look like in the future. Service providers spend a lot of time with CFOs understanding the direction they're going in. The partnership is about forming a strategic alignment for the future, not just the present.

AL: Cultural alignment and chemistry are the key words. It's about whether the parties see themselves working together long term as true and equal partners and not simply as client and service provider. □

Opportunities and challenges

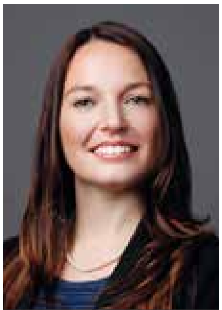
Managers should first weigh up the value-add of outsourcing

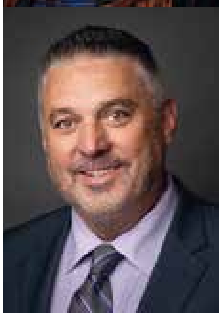
Opportunities	Challenges
▪ Focus on core and strategic activity ▪ Leverage the know-how, operational and technology model of the provider ▪ Facilitate rapid expansion in new markets where the provider is present ▪ Demonstrate independence of calculations to investors	▪ Finding the right partner that fits best with the current and future requirements of the business ▪ Aligning all relevant parties in-house on the need for, and benefits of outsourcing

***Source:** Alter Domus*

Phishing for facts

Managing and preventing fraud and cyber-risk is all about preparation, say Forensic Risk Alliance consultants Kylie Tanner and William Odom





The lengths to which fraudsters go to successfully scam businesses and individuals is most evident in email phishing, which has become increasingly sophisticated as the scammers collectively gather intelligence, collaborate and co-ordinate com-promises and evolve the scam. The FBI's Internet Crime Complaint Center (IC3) estimates the total cost of such attacks exceeded $5.5 billion in the past five years. Unfortunately, this is just one of the many types of cyberattacks that cause business interruption, reputational damage and financial loss.

Preparation may seem intuitive, but it is often glossed over and not properly utilized by many businesses. Fraud, with or without a cyberattack element, relies on weaknesses in a system which can be exploited. Best practices associated with preparation help an organization identify these weaknesses and act to mitigate risk ahead of any fraud or compromise.

Good practice

Identifying a business's critical data and risk areas is often associated with information governance. When utilized properly, IG balances the use of security of information, assists with compliance and legal issues, and reduces overall cost and risk of an organization's data. It helps identify a business's critical and at-risk data. This is only a part of the overall process.

Businesses should also identify risk areas within processes where technology may be limited. In email phishing scams, for example, the fraudster, in part, relies on the weakness in controls of an accounts payable group within an organization to send money outside the organization. While a business's email system may have been compromised, the fraudster is relying on someone inside the organization sending money without ever verifying if the transfer was a legitimate request. Best practice is to determine a holistic approach to identify all locations of critical data and risk areas.

Many organizations fail to create or effectively manage incidents because they have ineffective incident management, or none. Incident management involves the monitoring and detection of security events on a business's computer network as well as the execution of proper responses to those events. Proper response execution requires an incident response plan and a response team that follows this plan. A successful IR plan limits the amount of damage and interruption to a business while improving recovery time and costs associated with the incident. It is best practice to create and continually update the IR plan to address a company's changing risk areas.

A response team should be designated to enact the IR plan during an incident. While the incident and much of the response may be technical in nature, the team needs to include key stakeholders that can address business needs, not just technical needs. Every organization is different, but as a best practice, the response team should include personnel from IT services, information security, compliance, legal, human resources and public relations. Other departments may need to be considered depending on the size and complexity of the business.

Having an IR plan and response team are necessary, but they become ineffective if there is inadequate planning to stress-test the IR plan. A best practice is to perform testing on regular intervals, such as annually or bi-annually. This testing can be less technical, such as a table-top exercise, or more involved, such as penetration testing or other white hat hacking activities that stress-test the computer network.

All hands on deck

The responsibility for managing and preventing fraud and cyber risk in an organization includes and affects everyone within it. There are many facets to properly addressing an incident, but it is critical for a business to prepare through identification, response management and testing by instituting these best practices. ◻

Best practice steps to preventing fraud

1. Identify your business's critical data and risk areas
2. Develop an incident response plan
3. Assign key stakeholders to a response team
4. Test the IR plan for effectiveness