



ALTUS GROUP  
CRE INNOVATION REPORT



Altus Group

# ACCELERATING THE INNOVATION AGENDA

in Commercial Real Estate:  
**ARE KEY TRANSFORMATIVE TECHNOLOGIES DRIVING CHANGE?**

Research survey conducted by





## TABLE OF CONTENTS

OVERVIEW .....	4
EXECUTIVE SUMMARY .....	6
KEY FINDINGS .....	7
CRE REMAINS FIRMLY ESTABLISHED AS A MAJOR ASSET CLASS .....	8
ANTICIPATING THE IMPACT OF TRANSFORMATIVE TECHNOLOGIES .....	10
CRE has seen Major Benefits from Technology Investments .....	11
Is CRE Prepared for What's Next? .....	12
Smart Buildings, AI and Big Data Next to Disrupt? .....	13
Uncertainty Around AR, VR, Blockchain and Driverless Vehicles as Disruptors .....	13
KEY AREAS OF FOCUS WHERE TECHNOLOGY WILL IMPACT, ENABLE AND DRIVE INDUSTRY CHANGE .....	14
Automation Poised to Take Over .....	15
Industry Gap in Performance Management .....	16
The Growing Integration and Data Challenge .....	17
Tackling a Growing Skills Deficit .....	19
RECOMMENDATIONS .....	20
CONCLUSION .....	22

Virtually every industry is trying to create greater value through process efficiencies, better data and analytics and new applications that help to streamline business, and the commercial real estate (CRE) industry is no different. While some participants in the industry are playing catch-up, there exists a rapidly growing awareness of the impact transformative technology can deliver, and leading CRE organizations are already beginning to, or have already, put this into play.

Historically an underserved industry in terms of technology development, CRE is now attracting increasing amounts of technology venture capital investment – so much that investors have formalized the category with their own buzzword, “PropTech”.

The past 24 months have especially seen a rapid emergence of new applications and solutions designed to address specific challenges and pain points while also opening up new revenue and market opportunities – often transforming traditional processes along the way.

Even with ample funds flowing into PropTech and plenty of technology startups targeting the industry, a key question remains – to what degree are CRE industry executives today anticipating the impact of potentially disruptive technologies?

The latest Altus Group CRE Innovation Report, “*Accelerating the Innovation Agenda in Commercial Real Estate: Are Key Transformative Technologies Driving Change?*” explores how CRE companies are approaching disruptive new technologies, addressing existing gaps and challenges, and responding to the PropTech boom.

## KEY QUESTIONS POSED IN THIS REPORT:

How prepared is the CRE industry to embrace the next phase of technology innovation?

Where does the industry recognize the potential impacts of “game-changing” disruptive technologies?

Where do CRE executives see the biggest risks and opportunities associated with disruptive change?

This report is based on a global quantitative survey of 400 CRE C-level and senior executives in both front and back office positions at owner-operator and owner-investor firms in North America, Europe, Asia-Pacific and Latin America. All firms represented in the survey had assets under management (AUM) of at least USD \$250 million at the time of being surveyed, representing an approximate total AUM of over USD \$2 trillion. The survey research, used to help form the basis of the report, was conducted by leading international research firm IDC in September 2017.

# EXECUTIVE SUMMARY



**C**RE firms have benefitted strongly from their recent investments in widely-available technology solutions helping to drive cost and operational efficiencies, shorter transaction cycles, greater portfolio visibility and more transparent reporting, and even greater ease in the ability to raise capital. As the industry has advanced its IT and systems capabilities, and even the way it uses its core data, at the same time, CRE as a whole has become firmly entrenched as a major asset class. The last few years have seen new levels of venture capital flowing into new "PropTech" technologies which aim to disrupt traditional business models.

Yet even as new products and services reach the market, many CRE executives still have doubts about the potential for game-changing industry disruption that some of these technologies present. While this uncertainty looms among some, the survey findings indicate other executives are closely assessing the costs, benefits and complexities in key areas where they think the impact of rapidly developing technology will play out.

Process automation and performance management, in particular, are two areas identified in this year's report where technology advancements could significantly impact business operations. The challenge for CRE executives when contemplating implementation in areas like process automation and performance management is to look beyond their own firms' boundaries, and think of how technology advances could impact the industry as a whole.

Automation for example, often thought of in terms of what processes and workflows a firm can significantly streamline, could also be thought of in terms of how it can fundamentally change an entire process, such as debt underwriting - where new commercial debt technology infrastructures could exponentially reduce deal transaction times.

The PropTech-based proliferation of "easy to purchase – start using right away" cloud and mobile app-based solutions is a double-edged sword: CRE professionals can easily obtain functionality that tackles specific end-user problems without IT vetting, approval or assistance; on the other hand, executives recognize data integration and standardization as key focus areas for driving operational improvement. Having too many applications not only makes data integration more complex, it also has the potential to negatively impact a firm's information flow and decision-making.

While the industry has recently accelerated the overall level of investment in core technologies over the last number of years, the focus on entire applications, processes and outcomes is now beginning to be viewed through the lens of rapidly emerging disruptive technologies. Fundamentally, the innovation agenda for commercial real estate appears to be shifting to the next phase. CRE executives are now faced with the challenge of navigating both the risks and opportunities presented by new technologies and prioritizing the areas that can deliver the quickest wins and easiest pivot points.

## KEY FINDINGS



**More than 50% said most major CRE processes and workflows can be significantly or completely automated**



**Only 14% benchmark their operational expenses against competitors, the market or industry, indicating a significant performance management shortfall, yet 69% believe there is significant potential to conduct better benchmarking around operational expenses**



**58% of survey respondents are using significantly more CRE-specific applications now than they were three years ago; but 59% do not have significant integration between major management systems/applications**



**50% of survey respondents said they are facing a significant shortage of skilled technology staff or are not adequately staffed and need more technical resources**



**When asked about emerging disruptive technologies and their potential impact on the industry:**

- Only 28% said AI and Machine Intelligence will create disruptive changes in the CRE industry while conversely, 38% said it will have little to no impact**
- Only 24% said Big Data and Predictive Analytics will create disruptive changes in the CRE industry while conversely, 42% said it will have little to no impact**
- Only 15% said Blockchain will create disruptive changes in the CRE industry while conversely, 62% said it will have little to no impact**

CRE Remains Firmly  
Established as a Major

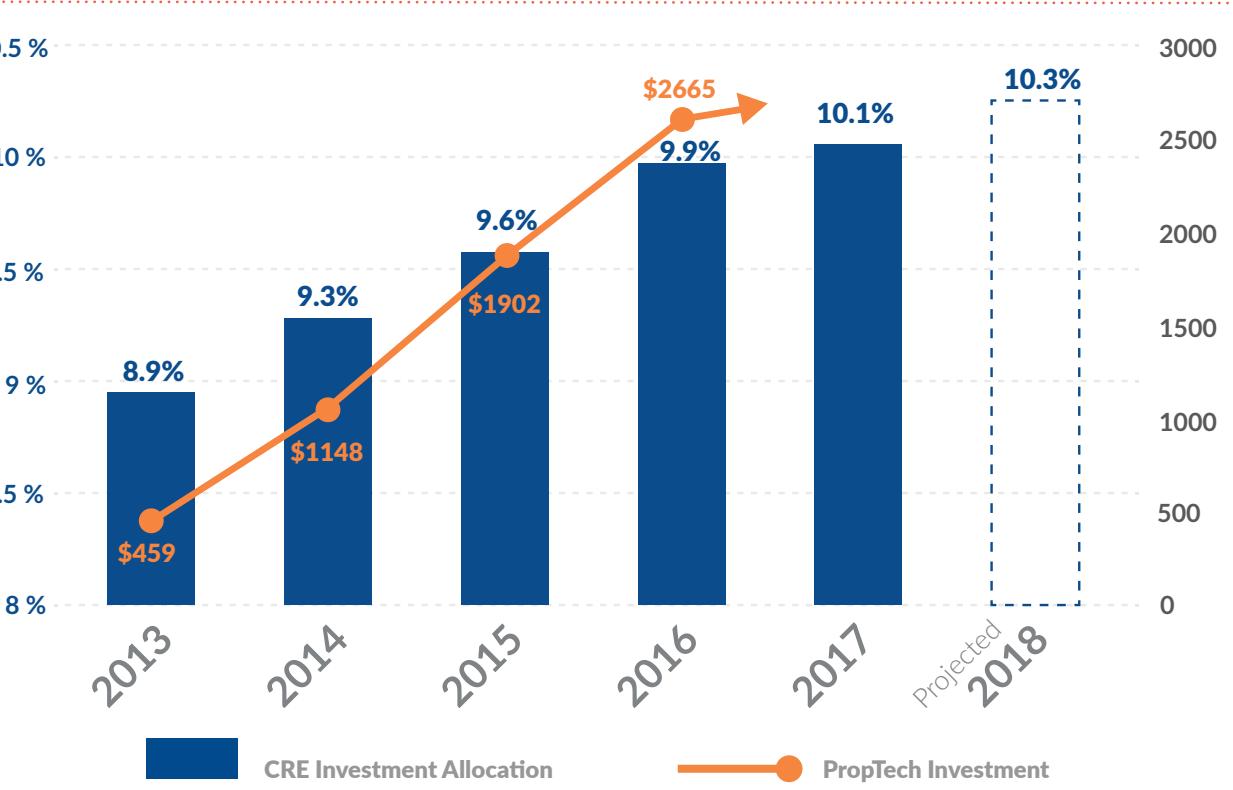
# ASSET CLASS

## CRE REMAINS FIRMLY ESTABLISHED AS A MAJOR ASSET CLASS

Research performed over the last several years by Cornell University's Baker Program in Real Estate has highlighted the development of CRE as the "Fourth Asset Class." The latest Baker Program/Hodes Weill & Associates Institutional Real Estate Allocations Monitor confirms CRE's position as a major asset class.

This new status has attracted an explosion of venture capital investment in PropTech aimed to capitalize on the industry's transition to increased technology adoption. CB Insights, a venture capital tracking firm, reports that over the past four years PropTech companies have raised almost USD \$6.2B in funding with astonishing year-over-year growth rates.

### REAL ESTATE ALLOCATIONS AND PROPTech INVESTMENT LEVEL



Source: 2017 Institutional Real Estate Allocations Monitor (Cornell University's Baker Program in Real Estate – Hodes Weill & Associates)

Source: Real Estate Tech Funding Reaches New Highs in 2016, CB Insights Research Briefs, January 2017

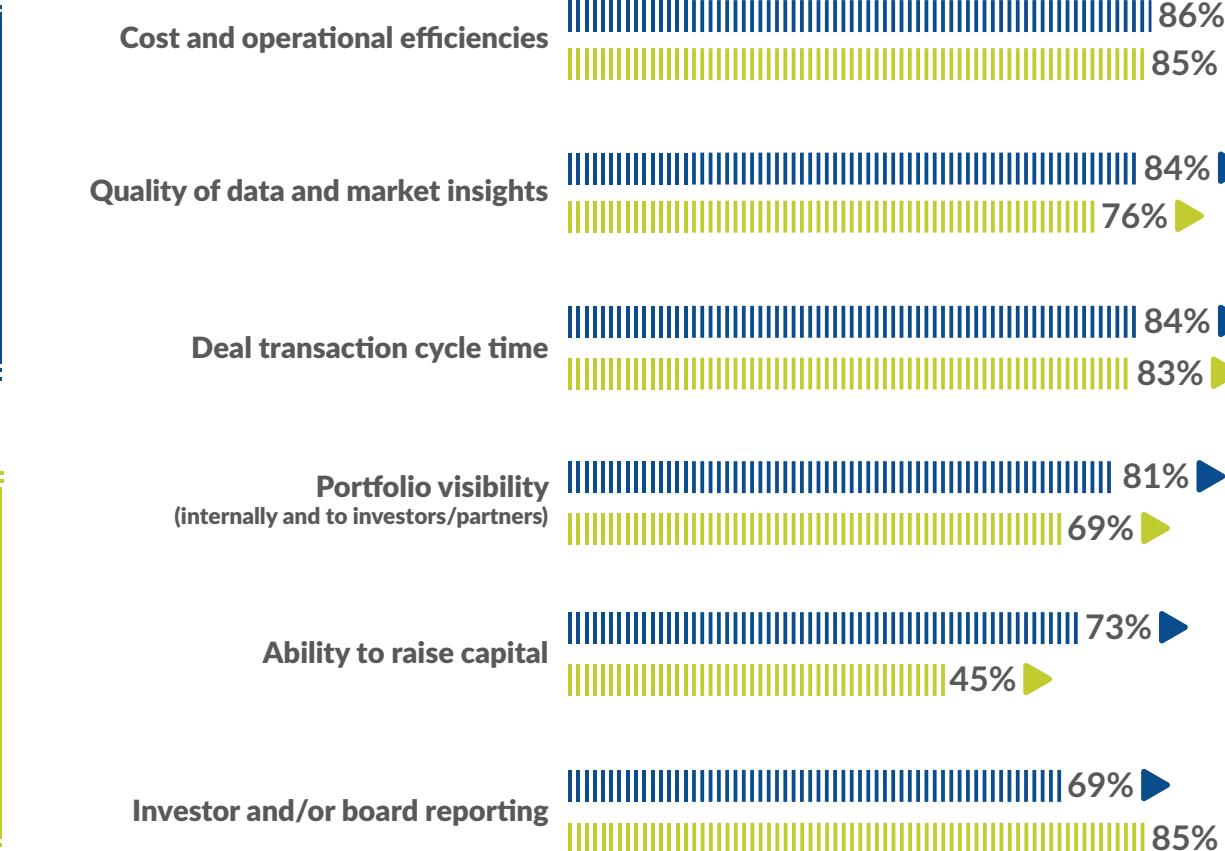
Anticipating the  
Impact of Transformative

# TECHNOLOGIES

## CRE has seen Major Benefits from Technology Investments

Consistent with last year's CRE Innovation Report findings, a large majority of executives surveyed this year report their firms have benefitted from technology investments and/or enhancements they have made over the past two years. Although the areas of impact differ according to firm size, both larger and mid-scale firms report positive benefits from their information technology investments.

### POSITIVE BENEFITS RESULTING FROM INFORMATION TECHNOLOGY INVESTMENTS

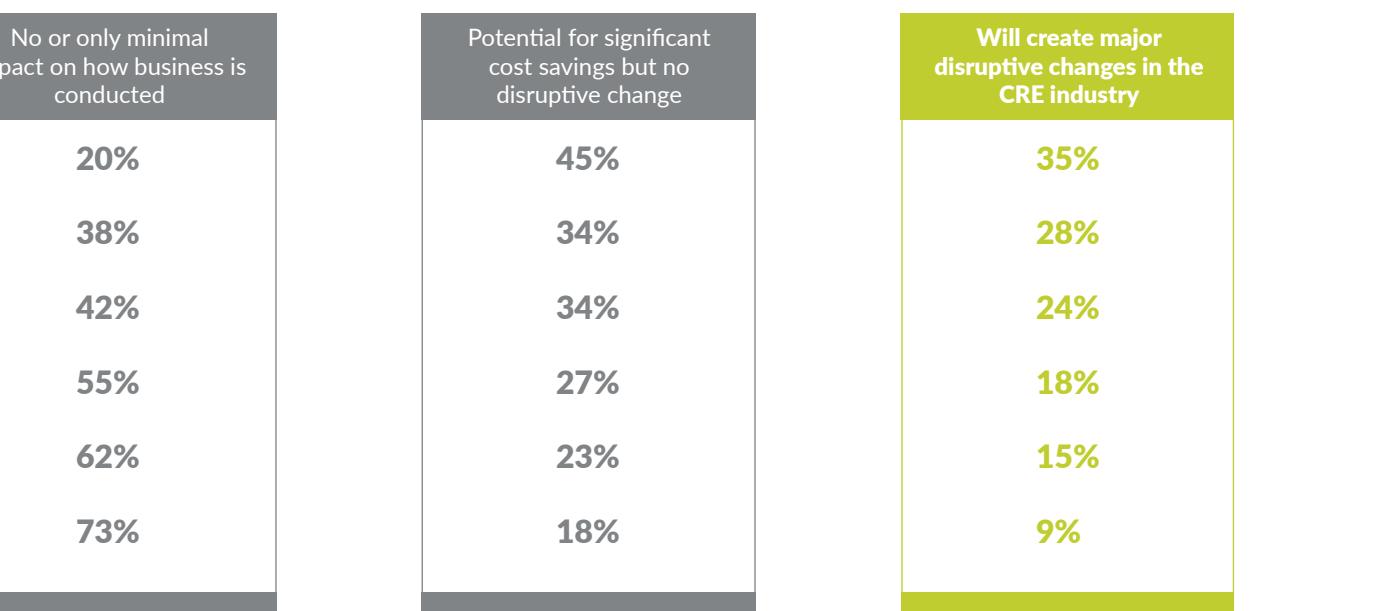


## Is CRE Prepared for What's Next?

As the adoption of established and widely available technology solutions continues, executives are now starting to see technology as a strategic advantage. This shift in emphasis is evidenced by the fact that 58% of respondents said that the biggest opportunity from investment and use of technology in CRE is more about making money rather than saving money.

The survey results also indicate, however, that CRE executives do not fully recognize the potential for some new technologies to have game-changing industry effects. When presented with six rapidly emerging disruptive technologies – several that are major drivers for venture capital investment in PropTech – a minority of survey respondents recognized them as having the potential for significant disruptive impact.

### POTENTIAL IMPACT OF EMERGING DISRUPTIVE TECHNOLOGIES



**58%**  
of CRE executives are investing in and using technology to help them make money versus save money.

## Smart Buildings, AI and Big Data Next to Disrupt?

Smart Building Technology is seen by 35% as being potentially disruptive and by 45% as having the potential for significant cost savings. Although not all together surprising considering the uptake and adoption of Smart Building Technology solutions to date, it now appears the industry as a whole is beginning to recognize its far-reaching impact from both an efficiency and strategic perspective.

However, for Smart Building Technology to maximize its potential, it needs to be heavily enabled by Big Data and Predictive Analytics, turning raw data into intelligent information for strategic decision-making or for Artificial and Machine Intelligence to automatically drive processes or improve systems. Lighting control, security, biometrics tech and sensors are now beginning to be enabled through the Internet of Things. Yet there exists reservations around the cost savings and disruptive potential for AI, Big Data and Predictive Analytics. This may have more to do with the early stage of adoption for some of these related solutions than the actual potential itself.

## Uncertainty Around AR, VR, Blockchain and Driverless Vehicles as Disruptors

Less than 20% of executive respondents said Augmented Reality/Virtual Reality, Blockchain and Driverless Vehicles would create disruptive changes in the CRE industry, with the majority of respondents saying these technologies would have minimal impact on how business is conducted.

Meanwhile experts in these fields have warned of the disruptive impact that these technologies can and have already made on other industries. While most CRE executives do not currently see these emerging technologies as having disruptive potential, these new innovations and the companies that are creating them have arrived and are rapidly gaining the attention of those in the industry who are closely assessing its impact and how it can be turned into opportunity.



The evolving future of mobility has the potential to change both the use and supply-and-demand dynamics for CRE. For instance, there may not be a need for large parking spaces in central business districts (CBDs) in the future, as driverless cars can be "sent" to park in less-dense areas. As a result, there could be significant redevelopment potential for existing parking structures in CBDs.

— Deloitte's 2017 Report on Innovations in Commercial Real Estate



Key Areas of Focus  
Where Technology will  
Impact, Enable and Drive

# INDUSTRY CHANGE

## ..... KEY AREAS OF FOCUS WHERE TECHNOLOGY WILL IMPACT, ENABLE AND DRIVE INDUSTRY CHANGE

The survey results clearly show that game-changing technologies are being received with some level of uncertainty. At the same time, industry executives have a close eye on the current state technology landscape. A deeper look in four key areas of focus – process automation, operational performance, integration and data, and skills and staffing – reveal opportunities and challenges currently facing CRE firms.

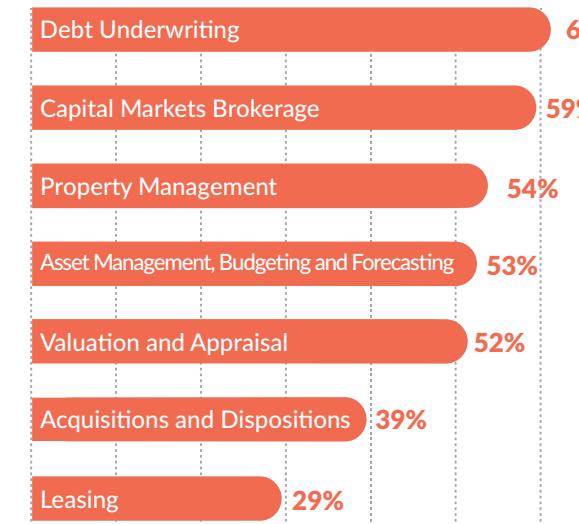
### Automation Poised to Take Over

When executives were asked how automation might take over traditional manual processes, the survey respondents indicated that process automation could be a major disruptive force in the CRE industry.

Over 50% said that many major CRE processes and workflows could be significantly or completely automated suggesting a potentially dramatic impact on people associated with these processes, and that the industry may be ripe for automation to take over.

#### PROCESSES WITH POTENTIAL FOR AUTOMATION

##### Can be fully or highly automated across all processes and workflows



Debt underwriting, especially for stabilized real estate assets, will eventually be performed almost exclusively by artificially intelligent bots, and not human labor. However, in the meantime, technology will enable human commercial loan officers to underwrite better and faster, creating more value for their companies and themselves.

The proliferation of commercial debt marketplaces allows lenders to quickly access hundreds of deals in a proactive manner, instead of learning about deals one-by-one from sponsors or institutional mortgage brokers. This process allows lenders to find deals that fit their parameters quickly.

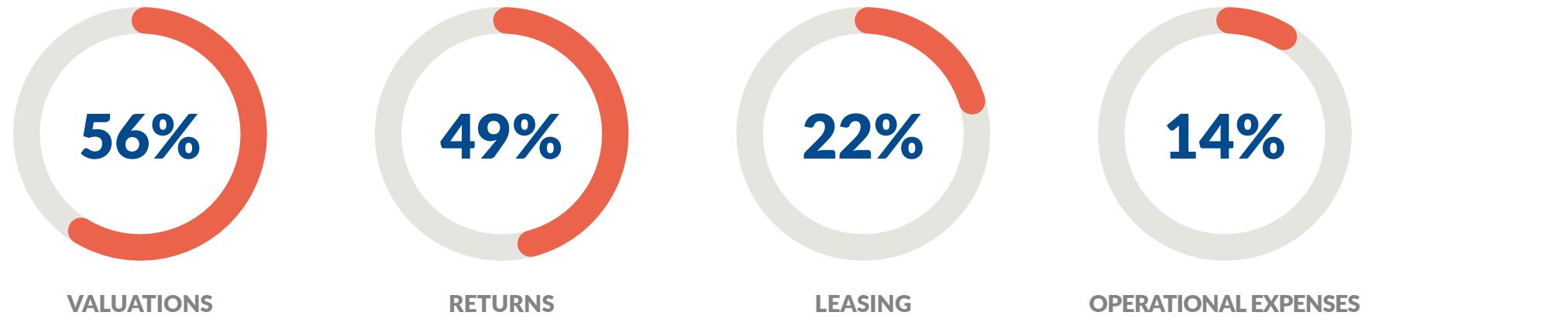
Lenders now have access to virtually up-to-the-minute market data sources through various Application Programming Interfaces (APIs). These APIs provide market data on comparable leasing transactions, cap rates and construction costs so that lenders can quickly stress test assumptions the sponsors make in the deals they upload onto the marketplace.

– Zach Aarons, Co-Founder & Advisor, **MetaProp NYC**

## Industry Gap in Performance Management

A substantial amount of PropTech development and venture capital is being targeted at operational performance, including data and systems for managing expenses. When asked which areas they measure performance and whether they could conduct better, more extensive benchmarking, respondents identified that benchmarking operational expenses, along with leasing, falls short as the most under-served area. As CRE continues to attract more investment and more competition, there is a major opportunity for CRE firms to improve their operational efficiency and performance management and, in turn, improve shareholder and client returns.

### AREAS IN WHICH FIRMS ARE CURRENTLY BENCHMARKING THEIR PERFORMANCE AGAINST COMPETITORS, THE MARKET OR INDUSTRY



### AREAS WITH SIGNIFICANT POTENTIAL TO CONDUCT MORE EXTENSIVE/IN-DEPTH BENCHMARKING



## THE CASE FOR MANAGING OPERATIONAL EXPENSES

**\$650 Billion** spent on commercial real estate operating expenses in US annually<sup>1</sup>

A **1% reduction** in operating expenses in US can generate over **\$105 Billion** in additional asset value<sup>2</sup>

For every **\$1** of decreased operating expense spent, **\$16** of property value is created

1 - \$650B calculated using the total SF in Office, Industrial, Retail & Multifamily asset classes per the Costar Group 2017 Mid-Year National Reports and NMHC tabulations of 2012 Rental Housing Finance Survey microdata, US Census Bureau updated 8/2015; multiplied by OPEX per square foot of \$9.47 according to Waypoint dataset information

2 - Estimated 1% savings of \$650 billion with weighted average cap rate of 6.23% from CBRE Cap Rate Survey First Half 2017

It's critical to know how your assets are performing real-time, not only against your underwriting assumptions, but also against key financial and operational market benchmarks. Without that knowledge, opportunities to optimize asset performance go unrealized and a significant amount of value is left on the table.

— Diane Vrkic, Founder & CEO, Waypoint

## The Growing Integration and Data Challenge

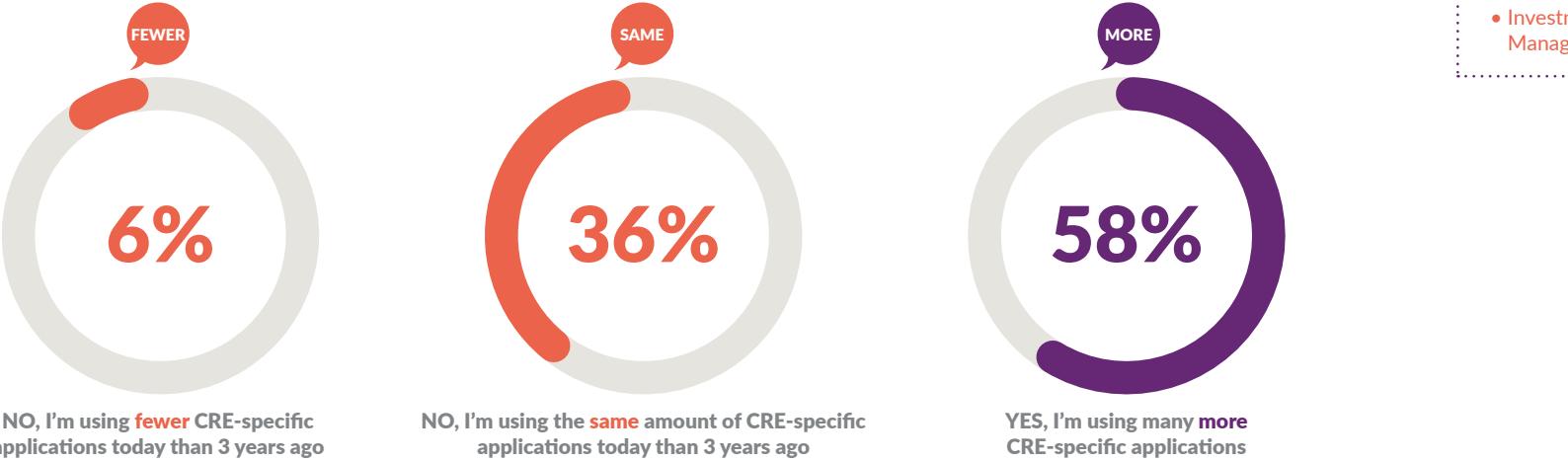
The PropTech explosion has brought with it the proliferation of applications targeting specific use and function that addresses a range of industry challenges. The ease of purchase and access to these online and cloud solutions, desktop applications and mobile apps mean that "**more apps than ever before**" have the potential to be problematic for a CRE organization. End-users can employ these solutions outside of any IT-vetting, approval or assistance. Executives already recognize data integration and standardization as key focus areas for driving operational improvements, and the growing number of available apps can add complexity in achieving this.



## KEY AREAS OF FOCUS WHERE TECHNOLOGY WILL IMPACT, ENABLE AND DRIVE INDUSTRY CHANGE

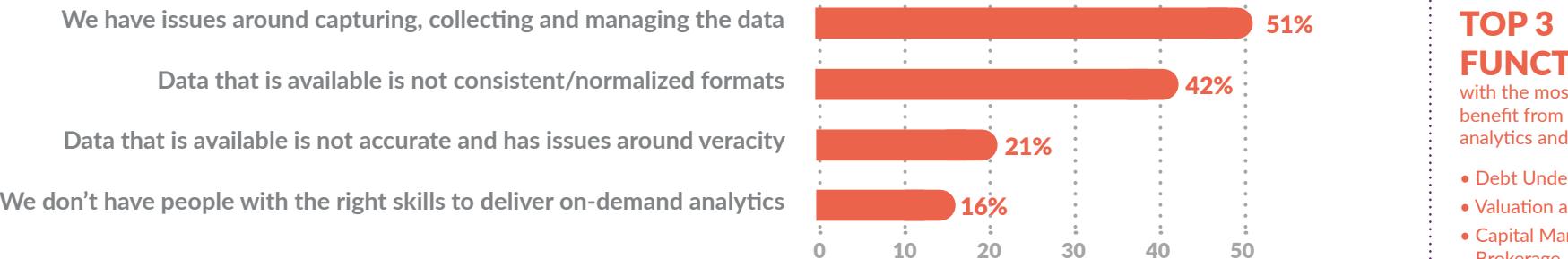
Executive respondents indicate that application proliferation is well underway but lacks integration. While the industry has made some progress on integrating data and processes, the growing number of CRE applications being consumed has the potential to move the industry backwards through the addition of data silos and added complexity. To date, the CRE industry has made meaningful advances in data management including collection, normalization and analysis. However, without proper integration strategies put in place, there remains a risk to organizations who may as a result struggle in deriving benefit and ROI from these additional technology investments.

### ARE YOU USING MORE CRE-SPECIFIC APPLICATIONS TODAY THAN YOU WERE 3 YEARS AGO?



Applications proliferation and lack of integration can negatively impact information flow and decision-making within CRE firms. When asked to identify which functions have the most potential to benefit from on-demand data access and analytics, survey respondents' top three choices were Debt Underwriting, Valuation and Appraisal, and Brokerage. However, key obstacles to providing on-demand analytics or reporting are related to data integration and standardization.

### OBSTACLES TO PROVIDING ON-DEMAND ANALYTICS AND REPORTING



**59%**  
of firms do not have significant integration between the following applications:

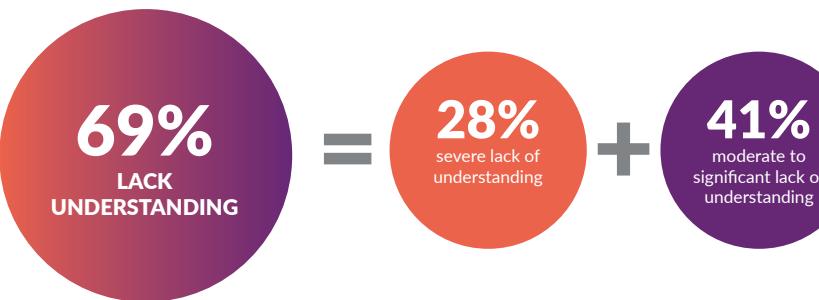
- Asset Management
- Property Management
- Leasing Management
- Investment and Debt Management

### Tackling a Growing Skills Deficit

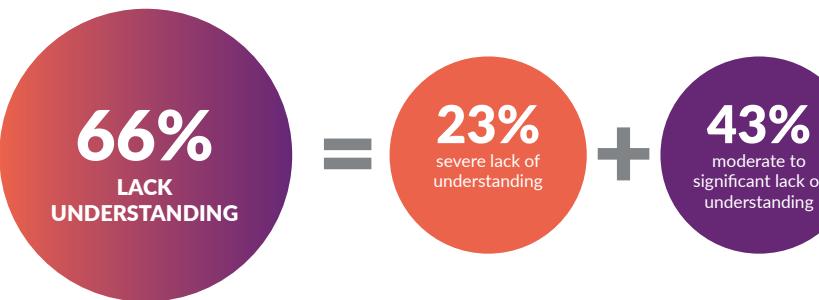
Lack of sufficiently skilled IT people continues to be a barrier for CRE firms trying to make the most of their technology and data investments. With 50% of executive respondents indicating their firms are lacking in technology staff, the boom in CRE technology will continue to put pressure on demand for skilled IT talent.

While hiring and keeping good talent is a major priority, the survey results also point to a continuing skills gap for both technology and business professionals.

### GAP OF IT PROFESSIONALS IN UNDERSTANDING THE BUSINESS ASPECTS OF CRE



### GAP OF BUSINESS PROFESSIONALS IN UNDERSTANDING OF TECHNOLOGY/IT



In addition, with a growing number of technology solutions that are more easily and frequently deployed, CRE organizations are more challenged than ever to keep all their employees, be it from the IT or business side of the house, fully trained, proficient and productive in the use of a wide-range of systems, applications and analytics that drive their businesses on a regular basis.



# RECOMMENDATIONS

Based on the survey results, we've identified key actions that CRE executives and their firms should take today.

## Anticipate What's Coming [And Understand What's Already Here]

As PropTech helps to transform the CRE industry, it is important for executives to not just keep an eye on how emerging technologies may affect their own firms, but how they may change their interactions with the processes of other segments - such as lending. Driverless Vehicles, for example, may seem more distant in the future, but this "game-changer," has the potential to fundamentally alter the way people think about the space that we occupy and the locations of our places of work and home. Our report indicates that Smart Building Technology, once seen as largely future-state and early stage, has now transitioned to being seen as having significant cost-savings and even disruptive potential going forward. That's a strategic shift in a considerably short period of time and it won't take long for newer innovations to also quickly change the way the industry does business or interacts with other players. In particular, Process Automation is viewed as the next big bet to hugely disrupt - but be mindful that other technologies like AI, Big Data and Predictive Analytics will be tightly connected and potentially seamlessly integrated with various elements and levels of automation.

## Proactively Manage Performance

While the CRE industry continues to rapidly increase levels of investment in data and tools around portfolio visibility and reporting, there remains significant opportunity to better manage and track operational performance. Even with the growing availability of tools and data to manage performance, executive respondents indicate that they could do much more with expense benchmarking. While approximately half of respondents indicated they are actively benchmarking valuations and returns, managing operational performance through leasing and expense benchmarking should be a more important area of focus for both the asset and property manager. With new tools and more data, the time is right for the CRE industry to place a greater focus on managing and delivering operational performance than ever before.

## Invest in People

The survey results indicate a growing gap in technology staffing and the growing deficit of CRE knowledge in their technology staff. We also asked about the potential for automation to take over the manual human effort of certain processes. The results showed that a very high percentage of executives agree that the growing innovations in process automation could significantly or completely take over these processes. With this in mind, CRE executives should prioritize efforts to train their technology staff around the CRE business and industry requirements and methods to ensure new automated processes work properly. But, possibly more important will be the transition of current CRE professionals into a world where AI and automated processes will be a common component of their business processes. Industry professionals will need to learn to work with these new systems or "bots" that will augment traditional ways of working.

# CONCLUSION

**S**imply adopting technologies and practices that are already prevalent in other asset classes is no longer enough for CRE firms to be prepared for the future. Technological advancements are already starting to impact, enable and drive industry change in areas such as process automation and performance management. CRE executives' competitive imperative is to start looking outside their own firms' boundaries to visualize and think of how technology advances will potentially change business models and even impact the industry as a whole.

While the overwhelming majority of CRE firms recognize the benefits of enhancement in their core data, IT and systems capabilities, the survey results show that only a small minority of CRE executives believe several key new technology areas will be sources of disruptive change for the industry. Meanwhile billions of dollars of venture capital are flowing into PropTech as large-scale investors and leading CRE firms seek to change the rules of the game by disrupting traditional CRE business processes and gain first-mover advantage.

As PropTech investment drives a proliferation of CRE-specific applications, the industry faces a growing integration and data challenge:

- 58% said they are using significantly more applications now than they were three years ago
- 59% do not have significant integration between major management systems/applications
- 50% of the firms surveyed said they are facing a significant shortage of skilled IT staff or are not adequately staffed and need more technical resources

CRE firms need to start looking at how their technology infrastructure will allow their processes, workflows and data to "digitally plug" into the technology advancements of the PropTech future that are starting to come to market now. This encompasses adoption of process automation and deploying data solutions that will allow firms to utilize new industry-wide processing frameworks, such as new commercial debt technology infrastructures and performance management benchmarking solutions.

CRE industry investment in business processes automation and workflows will be critical going forward. Even if a firm's leadership does not recognize an immediate strategic imperative for advanced digitization, simply meeting the major asset class standard of being able to measure, benchmark and manage operational performance across workflows and processes should be reason enough for any CRE firm to start assessing and addressing its technology infrastructure. Acting now will be critical to ensuring an organization's ability to be competitive in the future.



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Altus Group is a leading provider of independent advisory services, software and data solutions to the global commercial real estate industry. Our businesses, Altus Analytics and Altus Expert Services, reflect decades of experience, a range of expertise, and technology-enabled capabilities. Our solutions empower clients to analyze, gain insight and recognize value on their real estate investments. Headquartered in Canada, we have approximately 2,500 employees around the world, with operations in North America, Europe and Asia Pacific.

## Altus Analytics

SOFTWARE | DATA | CONNECTIVITY

Altus Analytics, the software and data solutions business of Altus Group, empowers commercial real estate clients and partners to work collaboratively to enhance decision making, drive performance and optimize transactional efficiency. Our solutions, including our flagship software ARGUS, enable customers to better organize and manage data while connecting them with the right information to help them gain a complete picture of real estate assets, portfolios and transactions.

## Altus Expert Services

EXPERIENCE | INDEPENDENCE | INSIGHT

Altus Expert Services, the professional advisory services business of Altus Group, delivers industry leading independent valuation, cost consulting, property tax and geomatics solutions. Our global expertise combined with regional market knowledge provides commercial real estate clients with greater insight to identify risks and maximize value on their investments. Through our multi-disciplinary consulting and research teams, we help firms see not only the big picture but deliver the knowledge and insights to form broader-looking perspectives. Our technology-enabled services and tools help our clients manage a wide variety of projects, business requirements and mandates.



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