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Real Estate Predictions 2021

From Location, location, location to Location, insights and experience



The COVID-19 pandemic has accelerated a number of trends in the world of real estate. What is the value of real estate in an increasingly digital world? And how can we prepare for an even more data-based, digital – and preferably sustainable – future? Deloitte can help. Our real estate professionals have deep industry experience and knowledge to help you achieve your business goals.

Executive Summary

Welcome to the 2021 edition of the Real Estate Predictions. Deloitte firms from around the world have collaborated to analyze the latest developments that are impacting the future of real estate. For an inspiring outlook on 2021 and beyond, please read our predictions and find out more about the future of work, sustainability, digitalization, and innovation in the real estate sector.

5G as an enabler for new and smarter ways of working

2020 has been a tumultuous year full of seismic shifts. It is easy to forget that another impactful infrastructure change is quietly taking place. The next wave of digital disruption is on course and 5G will be the "glue" that will tie all of our devices, buildings, and cities together, enabling new and smarter ways of working.

Gaming the commercial real estate talent conundrum

COVID-19 has disrupted human connections, which are at the heart of the commercial real estate (CRE) business. Last year, leaders in all industries were challenged to digitalize many aspects of work while shifting and engaging employees in a virtualized environment. Looking ahead, what does this tell us about the future of work in real estate?

Gaining a competitive edge in real estate with AI-driven geospatial analytics

Data analysis can significantly improve decision-making in real estate. From valuation, sale/purchase of properties and contracting to negotiations, risk analysis and planning. In 2021, all eyes will be on AI-driven geospatial analytics. Why? Because it is a quick, lean and affordable way to provide address-specific rental predictions and explainable transparency.

Innovation & construction in the shade of global crisis

The COVID-19 crisis has shed light on another well-known crisis that has the potential of exponentially harming humanity to a point of no return - global warming. If we want to avoid the many consequences of global warming, we should accelerate our efforts, starting now. How can digitalization and innovation enable the industry to prepare for a sustainable future?

The virtual office for Corporate Real Estate

The widespread adoption of remote working in 2020 has greatly shifted the role of the workplace within organizations. All indications point to a future where hybrid working is here to stay. So how do real estate owners respond as the virtual office becomes a key component of working in the "new normal"?

Real Estate-as-a-Service: From "product and space" to "system and service"

Real estate is undergoing a fundamental business model redesign enabled by digitalization and a growing market of smart buildings. What business model will be successful in the future? What can the real estate industry learn from tech? What is Real Estate-as-a-Service? And what is the impact on strategy and organizational performance?

The impact of social good on real estate

"ESG", the generally used acronym for "Environmental, Social and Governance", has become an important business consideration all around the world. For instance, real estate investors have an increasing focus on sustainability. However, ESG in real estate can be so much more impactful. How can it become an important value driver?

Understanding Private Rented Sector property

One of the megatrends in real estate is the need for rented housing in the main capitals. COVID-19 has accelerated this trend. However, there is an insufficient and inadequate stock of rental housing, so a specifically designed product must be developed to match demand and offer new real estate opportunities. Enter Private Rented Sector (PRS) property.

Optimizing your use of office space and real estate footprint

COVID-19 has accelerated new ways of working, which in turn will impact the use of office space. What are the implications for the real estate industry and corporates? What opportunities will arise? How to prepare the property portfolio for a more agile future of work? The urgency is clear: the time to act is now.

Protecting your identity in the digital world

Protecting (proof of) our identity is extremely important in our society. Particularly in the digital world, identity theft or misuse is a serious risk, and interactions and transactions in the digital world have a serious impact for us in the real world. Self-sovereign identity is all about control over our digital identity.

Improvise. Adapt. Overcome. How to cope with the impact of climate change

Climate change has consequences for nature, people, and therefore also real estate. Mitigation and adaptation are strategies to deal with the potential risks of climate change. What is the impact of climate change strategies on the future of real estate, in terms of markets, planning, construction, and renovation?

Digitalization is here to stay

The real estate industry is currently adapting to evolving market conditions, a changing regulatory environment, and a fast-growing technological landscape. This is described in detail in our 2019 European Operations and Technology Survey for Real Estate Investment Managers. A survey that was completed by a range of European real estate investment and asset managers. What can we learn from their replies? How to achieve an effective digital transformation in our industry?

How to support strategic decision-making in real estate

Urban planning, asset management and investment decision-making require a thorough understanding of the current and future supply-demand dynamics and underlying macro-economic factors. The integration of Artificial Intelligence (AI) with real estate and financial planning expertise can help support new ways of analyzing historic data in an attempt to improve future decisions.

Table of contents

Executive Summary	03
5G as an enabler for new and smarter ways of working	06
Gaming the commercial real estate talent conundrum	09
Knowing what others don't: gaining a competitive edge in real estate with AI-driven geospatial analytics	14
Innovation & Construction in the Shade of Global Crisis	17
The virtual office for Corporate Real Estate	20
Real Estate-as-a-Service: From "product and space" to "system and service"	23
The impact of social good on real estate	26
Understanding Private Rented Sector property	30
Optimizing your use of office space and real estate footprint	34
Protecting your identity in the digital world	37
.....	
Improvise. Adapt. Overcome. How to cope with the impact of climate change	40
Digitalization is here to stay	44
How to support strategic decision-making in real estate	49
Authors	54
Contacts	55

5G as an enabler for new and smarter ways of working

Implications for real estate and construction



2020 has been a tumultuous year full of seismic shifts in everyday norms. In a year marked with greater public scrutiny of embedded social structures and behaviors, it is easy to forget that another impactful infrastructure change is quietly taking place. The next wave of digital disruption is on course and the 5G rollout will be the enabler. 5G will be the “glue” that will tie all of our devices, buildings, and cities together, enabling new and smarter ways of working for all of us.

The need for speed, latency, reliability, and capacity

For the last several years, 4G – which was itself revolutionary at its introduction around 2010 – has served our society well. However, our demand for accurate and fast data is growing exponentially, and inherent limitations relating to **speed, latency, reliability, and capacity** are becoming more and more apparent. 5G mobile internet is a major leap forward from 4G. If its full potential is realized, it will not only address 4G’s limitations, but will transform the way we live, work, travel and play.

5G operates over much higher radio frequencies than 4G, which requires the substantial upgrade, and addition of, cell towers. Higher frequencies require the closer proximity of cells, meaning that “small cell sites” will need to be added to buildings, light poles and other structures across the country. Network providers are building this high speed infrastructure at pace though, to date, the initial commercial application for the 5G rollout has centered upon mobile broadband.

More to come

The first 5G networks were launched in 2019 and were largely deployed from existing 4G base stations. Since then, various major network organizations have also launched 5G mobile network capability in a limited number of cities and towns. There is much more to come – 5G could solidify the business case for transformational technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Augmented & Virtual Reality (AR & VR) and Digital Twins all of which could have a significant impact in digitalizing various sectors – the sky is “virtually” the limit.

Unsurprisingly, the rollout has been impacted by trade and tech disputes regarding certain 5G equipment and by the outbreak of COVID-19 for reasons including a reduced consumer demand (due to the increased Wi-Fi usage working from home), allegations linking 5G rollout with the COVID-19 spread, and lack of understanding concerning the benefits of 5G.

Implications for real estate and construction

Numerous industries have made significant digital transformation strides with 4G capability. What are the benefits of 5G? How can real estate leverage this new technology to accelerate digital transformation within an industry that is well behind others? Let’s explore the answers to these key questions further.

Greater network speeds

Standard 4G provides a maximum potential real world speed of around 80Mbps whereas 5G could reach peak speeds of 10-20Gbps¹. In combination with increased bandwidth, improved network speeds could greatly enhance construction processes. For instance, the remote use of VR could support communicating ideas to project teams in an agile setting. Also, 5G could increase the use of off-site manufacturing, unlocking AI to optimize quality control and risk escalation processes, and increase the use of 3D printing to create standard building components. It could improve information

1 House of Commons Library, 5G Briefing Paper 2019, September 6, 2019, page 4.



storage, progress tracking and automated project controls. And track and trace supply chain logistics could support “just in time” delivery and minimize corruption.

The most significant benefit for the construction industry will most likely be 5G’s ability to take Building Information Modelling (BIM) to the next level, which will enhance the potential for fully confederated 6D Models and enable the creation of a cloud-based “digital twin”. This will support more efficient delivery, integration and better decision making throughout the building lifecycle from concept design through to decommissioning. Further, the creation of these models will allow clients to “look and feel” their projects earlier in the delivery process.

Low latency

5G is expected to reduce latency² in the order of 1 millisecond³. In other words, 5G response times will feel instantaneous⁴. The implementation of IoT in real estate is progressing at a rapid pace, with more and more new buildings being specified with sensors inside and out. 5G will enable instantaneous connectivity to real time building usage data and infrastructure, providing scope for accurate tenant occupancy data and optimized maintenance regimes on assets. In the future, landlords may take advantage of private 5G splicing (i.e. pay for what you use, down to the device) to increase yields by offering bespoke services to their tenants. The potential for building assets with wire-free connections instead of Wi-Fi could radically reduce the implementation complexity of core building management systems (including fire, security, lighting, HVAC and energy/utilities).

Faster response times between devices will also allow for the more widespread use of autonomous vehicles and the associated transport infrastructure. With more people working from home, 5G connections may soon replace the need for Wi-Fi. Valuation of 5G technology infrastructure will have to be considered within future

development appraisals to enhance value and marketability.

High capacity

More bandwidth and data capacity would reduce competition for connection and would allow the support of up to one million devices per square kilometer. 5G combined with big data applications and cloud storage capabilities could increase data on space utilization, power and energy consumption. A much-needed retail revolution could start with VR and AR to create experiential retail environments and be further developed by in-store analytics to personalize shoppers’ experiences. Big data applications could also support the continued effort to enforce social distancing as more offices and retail outlets open.

In time, collecting and interpretation of data produced by real estate assets will become a defensive strategy for most real estate stakeholders. It will help them to maintain an edge over their competitors. Also, more regulatory requirements are imposed by governments to encourage the use of 5G technology, as it will increase productivity and efficiency and improve sustainability performance.

Challenges

It is important to factor into any business case the challenges involved with optimizing 5G and the various technologies it enables. These include but are not limited to:

- shorter frequency waves requiring small cell site technology with antennas as close as 500 feet apart
- higher risk of obstacles (including building materials) blocking or disrupting high frequency 5G signals
- many devices that will need to be 5G enabled, e.g. better battery technology
- GDPR legislation and privacy laws that may limit 5G optimization.

5G as an enabler for workplace transformation

As pre-existing working patterns continue to shift, 5G could further consolidate the workplace transformation. Fully integrated 5G offices could create enhanced revenue opportunities for landlords through different types of leasing models. Business models of flexible office operators, booking desks and meeting rooms with specific digital capability, may become more common as 5G networks expand.

Key observations

2020 may have slowed down the 5G technology revolution, but it has also further highlighted the need for improved connectivity, greater network speeds, reduced latency and wider bandwidth capacity to support digital transformation. Although there are challenges in implementing 5G and no doubt greater speeds will soon exceed it, the economic and social benefits will outweigh the costs. The real estate sector has the “bandwidth” to reap some of the greatest benefits from its implementation.

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2 Latency is the time taken for devices to respond to each other over the wireless network.

3 4G is around 30 milliseconds

4 Ofcom, What is 5G, March 9, 2018; [accessed November 28, 2020]

Gaming the commercial real estate talent conundrum

Talent strategy in a post-pandemic world



The COVID-19 pandemic has disrupted human connections, which are at the heart of the commercial real estate (CRE) business. Leaders in all industries were challenged to digitalize many aspects of work while shifting and engaging employees in that now-virtualized environment. Companies had to provide the infrastructure that would enable employees to work effectively from home, while prioritizing health and safety. Looking ahead, what does this tell us about the future of work? How can we prepare for the challenges of talent strategy in real estate?

One implication is that the ability to succeed in the post-pandemic world will be hampered in the near term by employee concerns about returning to work. This was acknowledged by more than 50% of respondents to the Deloitte Center for Financial Services' Global Outlook Survey 2020.

Traditional skills or advanced technology skills?

The pandemic also highlighted challenges in a highly manual business model dominated by traditional job roles and skills in critical business areas including accounting, building maintenance, and customer service. Pre-pandemic, some CRE companies were continuing to lag other industries in their adoption of certain technologies and recruitment of tech-savvy talent. To support this, our analysis of skills demand in the United States during the 2014-2019 period revealed a higher and sustained demand for traditional skills. In contrast, there was muted growth in demand for advanced technology skills such as data analytics, software

development, and cloud computing (see Figure 1). Additionally, our analysis of job openings for 500+ roles showed that traditional skills were highlighted as "must haves" across all construction and general management job openings. Only risk management, and marketing and CRM-related job postings required advanced tech skills in more than 10% of job postings.

The focus on traditional skills was pervasive across different CRE subsectors as well. For instance, REITs looked for traditional sales and marketing skills in more than 60% of job openings. More than 50% of brokers' job listings sought finance and accounting (F&A) skills. However, advanced data analytics skills were sought by REITs and brokers in only 1% and 3% of job listings, respectively.

Refreshing talent strategy is a growing imperative

It is a growing imperative for CRE companies to digitalize business processes and refresh their talent strategy so as to not lag further behind. Of note, 41% of survey respondents agree or strongly

agree that their company has accelerated efforts to use technology and tools in redefining business processes, job roles, and skill requirements (Figure 2). Regionally, a higher proportion of European respondents (47%) are likely to do this, as compared to those in APAC (44%) and North America (32%). And only 36% of the respondents acknowledge that their organization is refreshing its talent/recruitment strategy to shift to future technology and skills needs.

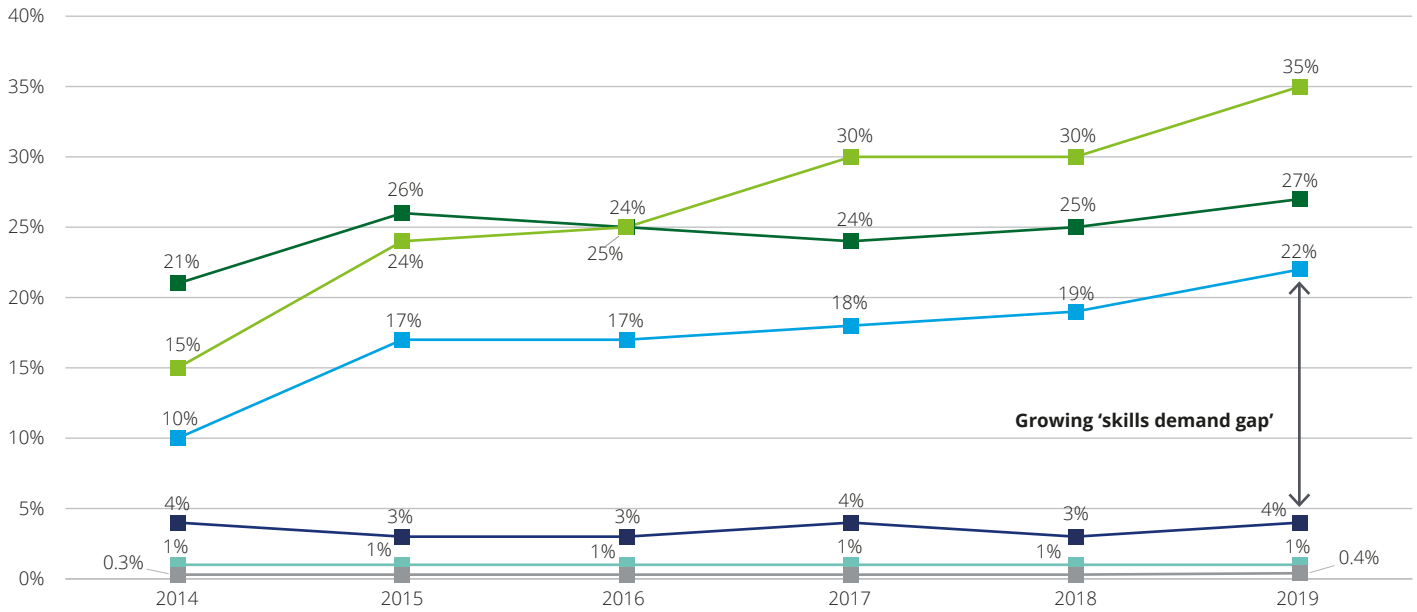
CRE companies should consider the following actions to envision the future work and skill matrix and to facilitate the recruitment of right-skilled talent:

01. Redefining roles and skills
02. Modernizing recruiting approach
03. Creating alternate talent marketplaces
04. Strengthening talent analytics



Figure 1: CRE companies continue to demand traditional skills

Proportion of job openings demanding traditional and advanced tech skills

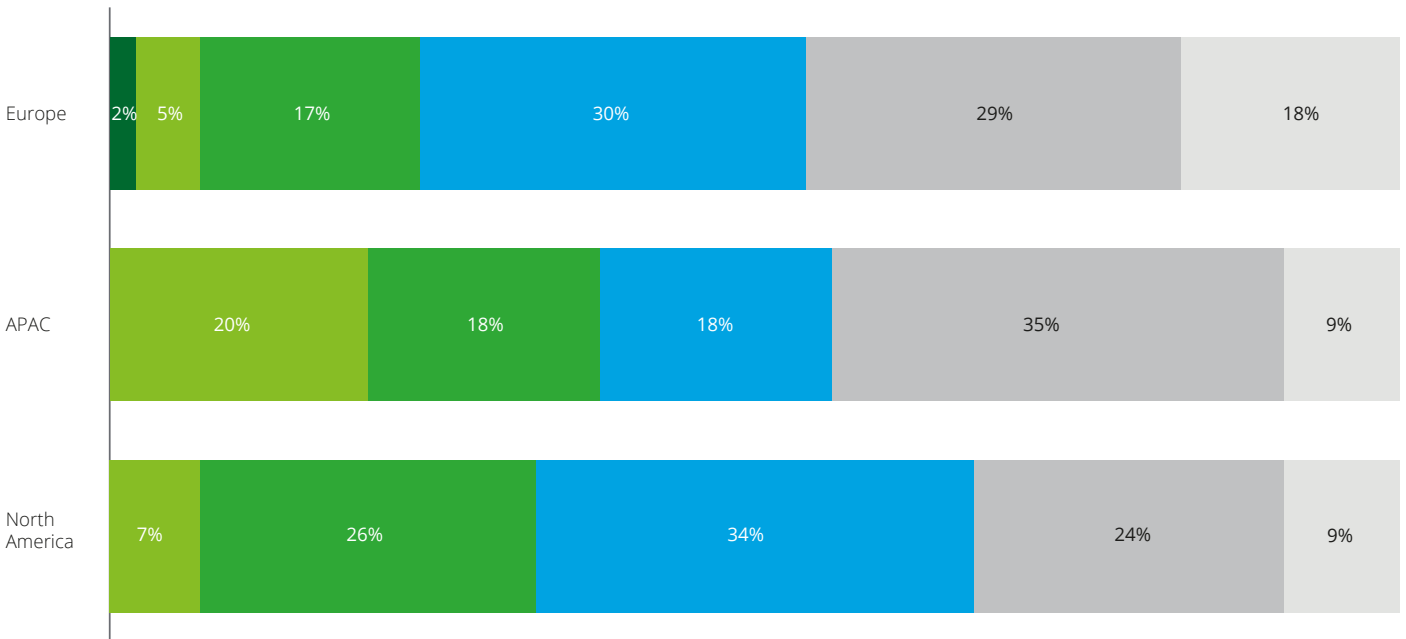


Traditional skill areas → Finance & accounting, Sales and marketing, Property management
Advanced tech skill areas → Data analytics and AI, Software development, Cloud computing

Source: LinkUp jobs data of US real estate companies; Deloitte Center for Financial Services analysis.

Figure 2: CRE companies' urgency to redefine talent

My company has accelerated redefining business processes, job roles, and skill requirements to include use of technology and tools



Note: Responses might not add up to 100 due to rounding-off.

Source: Deloitte Center for Financial Services' Global Outlook Survey 2020.

Legend: Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree, Somewhat disagree, Somewhat agree

Redefining roles and skills

To illustrate future work and job roles, we have envisioned how modernizing work could transform three positions: leasing manager, valuation advisor, and accounting specialist. (See figure 3). Analysis of three main job components – the automation of certain tasks, emphasis on analyses and insight generation, and tenant engagement – reveals how CRE roles would likely need to evolve to meet future needs. Workers in these roles will probably spend more time using technology while devoting their expertise to conducting analyses and strengthening tenant engagement. For instance, leasing managers could have more time to focus on enhancing tenant or client engagement if they used predictive analytics to help develop different lease optimization strategies. And other tasks, such as invoicing, would be automated, freeing up even more time.

As responsibilities shift, the skills and qualifications needed for each role are expected to evolve as well. At a minimum, each role would require technology or analytics coursework such as a bachelor's degree or certification in big data or real estate analytics. Employees will also need to excel at soft skills such as critical thinking, problem solving, communication, presentation, and relationship building.

Modernizing recruiting approach

CRE organizations could use different technologies during the recruitment process to attract the right-skilled talent. Talent leaders can create digital content and use an array of social media channels and job platforms to promote open positions. For instance, Intuit uses virtual reality technology to provide candidates with a real-time experience of what it would be like to work at its campus, and to gain a deeper understanding of the organization's culture and ethos and its use of technology in day-to-day activities¹. This is likely intended to not only enhance a candidate's understanding of the company, but also its brand.

For job postings, CRE organizations should use shorter descriptions and enable a more mobile-friendly application process, which would help candidates apply easily. For shortlisted candidates, organizations could use automated interview scheduling solutions that are synced with interviewers' calendars, allowing candidates to find an interview slot in real time².

Creating alternate talent marketplaces

To get access to these new skill sets and increase workforce agility, CRE organizations should consider recruiting through a variety of channels and not rely on the traditional approach alone. For example, the alternate workforce, consisting of e.g. contractors, freelancers, and gig workers, is expanding rapidly and could offer CRE organizations wider access to talent with advanced tech skills. For instance, the estimated number of self-employed workers in the United States in 2020 is 42 million³. Therefore, CRE companies should consider developing a talent marketplace to include alternate workforce, and offer rotation programs, stretch or voluntary assignments to existing employees.

For an internal talent marketplace, companies would need to look at job processes and identify intersection opportunities where employees in one department could work in another. They may have to upskill or reskill existing employees, which could include revamping of existing training curricula, redefining expectations and skills, and developing effective measurement criteria.

CRE organizations could consider developing internal knowledge-sharing and mentoring programs. Experienced professionals could then teach younger employees core sector and soft skills that are related to leadership and relationship-building. At the same time, younger employees can provide informal learning sessions with older employees to help

improve their use of digital tools and absorb the business impact of digitalization.

Strengthening talent analytics

CRE leaders are more likely to make sound talent decisions if they are backed by data and analytics. Workforce analytics programs can also help CRE organizations attract and retain the right talent. For example, data analytics can be used to improve resumé sourcing and screening to get candidates with the right fit, while avoiding any selection bias. Data mining and pattern recognition can help talent leaders to shortlist appropriate candidates, after matching their skills, experience, and background with job requirements⁴. As shortlisted candidates go through the interview process, more structured and unstructured data would be generated based on their responses and behaviors. CRE organizations can then combine this data and select candidates by predicting their success in a role through machine learning models, which leverage past data on hiring and success of candidates⁵. Essentially, digital HR systems can help firms collect and manage data better which, in turn, would enable predictive analytics to help leaders make more informed talent decisions.

Gaming the talent gap

The need to quickly change and adapt has never been so high for the CRE industry. Right-skilled talent can play an important role in determining whether a company stays ahead of the competition or plays catch-up as the business environment evolves over time. CRE leaders should consider redesigning talent – rethinking and adapting the way their employees work, embedding technology into their decision-making, and redefining skills, talent processes, and practices to help them prepare for the future of work.

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2 Ruma Batheja, "Recruitment technology tools that every recruiter must know," People Matters, May 23, 2019.

3 Erica Volini, Jeff Schwartz, and Brad Denny, "2020 Human Capital Trends Ethics and the future of work: From "could we" to "how should we"," Deloitte Insights, May 15, 2020.

4 "Talent acquisition analytics Driving smarter sourcing and hiring decisions with data," Deloitte, 2018.

5 Ibid.

Figure 3: Evolution of CRE roles

Key components of the role		Automation of certain tasks	Emphasis on analyses and insight generation	Strengthening tenant/client engagement
Leasing Manager 	Current tasks (2020)	<ul style="list-style-type: none"> Prepare and maintain physical lease contracts and invoices Manually enter and extract lease data and manage on disparate systems 	<ul style="list-style-type: none"> Conduct predictive analytics and identify opportunities for lease optimization Draw insights from sensor data to improve building management Work with sales team to promote properties and with legal team to vet lease documents 	<ul style="list-style-type: none"> Be the single point of contact for tenants and enhance engagement and service
	Future tasks (2023)	<ul style="list-style-type: none"> Create and maintain digital lease contracts Manage integrated digital lease data using cloud-based software Manage automated invoicing and lease data abstraction 	<ul style="list-style-type: none"> Interpret and share lease information and analysis on spreadsheets Share lease and market information with internal departments 	<ul style="list-style-type: none"> Follow-up on rent payments with tenants
CRE Valuation Advisor 	Current tasks (2020)	<ul style="list-style-type: none"> Conduct physical property inspection and manually document the details Prepare valuation reports on paper or spreadsheets Fill back-up data like demographics, comparable properties etc. into report 	<ul style="list-style-type: none"> Gather data on traditional variables from internal or third-party databases Perform competitive analysis of rents, market value of similar properties etc. 	<ul style="list-style-type: none"> Provide valuation report to clients, as per the agreed timeline Manage regular communication with clients and resolve queries
	Future tasks (2023)	<ul style="list-style-type: none"> Conduct virtual inspection using geospatial platforms and use mobile apps for physical visits to centrally store the data Automate generation of valuation reports and autofill background data Provide more reliable and real-time valuation 	<ul style="list-style-type: none"> Utilize AI-assisted valuation models that combine and analyze sensor and other alternative forms of property and market data 	<ul style="list-style-type: none"> Advise clients on asset strategy based on valuation forecasts Perform risk modelling and advise clients on wider risks associated with a property
Accounting Specialists 	Current tasks (2020)	<ul style="list-style-type: none"> Collect and sort actual bills and checks Enter daily ledger entries into the system Reconcile accounts and bank statements Create recurring and ad-hoc reports on standard timelines 	<ul style="list-style-type: none"> Manually compare and analyze work orders, invoices, and payments 	<ul style="list-style-type: none"> Provide relevant accounting information to internal clients and stakeholders
	Future tasks (2023)	<ul style="list-style-type: none"> Enter digitized source documents of bills and checks Automate ledger entries, reconciliation, reporting, and compliance checks 	<ul style="list-style-type: none"> Leverage AI and data analytics to identify irregular expenses and raise flags for review 	<ul style="list-style-type: none"> Partner with internal clients and stakeholders on accounting treatment and help forecasts income, expenses, and budgets
Key benefits across roles		<ul style="list-style-type: none"> Enhanced efficiency and productivity Simplification of tasks Improved data accuracy Additional time to perform higher order tasks 	<ul style="list-style-type: none"> Deeper and forward looking insights Risk mitigation More nuanced, informed, and faster decision-making 	<ul style="list-style-type: none"> Learning and exposure for employees Increased synergy within teams Stronger relationship with clients

Source: Deloitte Center for Financial Services analysis.

Knowing what others don't: gaining a competitive edge in real estate with AI-driven geospatial analytics



Micro-analysis on address level

Data analysis can significantly improve decision-making in real estate. From valuation, sale/purchase of properties and contracting to negotiations, risk analysis and planning. In 2021, all eyes will be on AI-driven geospatial analytics. Why? Because it is a quick, lean and affordable way to provide address-specific rental predictions and explainable transparency.

Micro-analysis on address level

The availability and interpretation of the right information is crucial in any sector, including real estate. After all, data analysis can significantly improve decision-making, from valuation, sale/purchase of properties and contracting to negotiations, risk analysis and planning. Obviously, there is an abundance of data about the world's biggest cities. This makes macro-analysis for these places straightforward and relatively easy for skilled data scientists. However, the smaller the place, the harder it gets to create a good understanding of locations – even on the aggregated view provided by zip code areas. For single addresses (micro level) this is even more difficult. The same is true for data-rich hotspots, if the required skills are lacking. For instance, the rental value of two properties that are only a couple of meters apart, can already differ significantly due to the presence of e.g. railway lines, noisy streets or polluted waters.

Major challenges

However, when it comes to data management in the real estate sector, there are still a number of major challenges. Often the required data are simply not available, not granular enough, or outdated. If they are available, they might not yet be harmonized across geographic areas. So even before the start of a simple analysis, a lot of effort is required. This also pertains to other manual data corrections, such as missing values or incorrect master data. While for master data the case is clear-cut (a value is either correct or not), other data issues might require expert judgement. In other words, there is a risk of ending up with expensive but worthless or even misleading analysis results, due to, for instance, personal bias by the expert "correcting" the data issues. The alternative is buying data on social demographics, rents, purchase prices and geographic points-of-interest (POIs), but good data always comes at a (potentially steep) price.

However, once all of these barriers have been cleared, the insights, which can be derived, will usually pay off well.

Reaping the benefits

Real estate companies that are able to gain a lead in mastering their own and acquired data by means of advanced data analytics, will reap the greatest benefits. Enhancing your own datasets with additional geographic features will justify the application of powerful analytics techniques such as deep learning. This in turn will lead to much better insights into previously not well-understood market developments, sub-markets, locations and interdependencies.

Digitalization: digital location twins can bridge the knowledge gap

A combination of various approaches to "digital twins" can be of great value in real estate. Whereas the sensor-based approach (i.e. Internet of Things, or IoT)



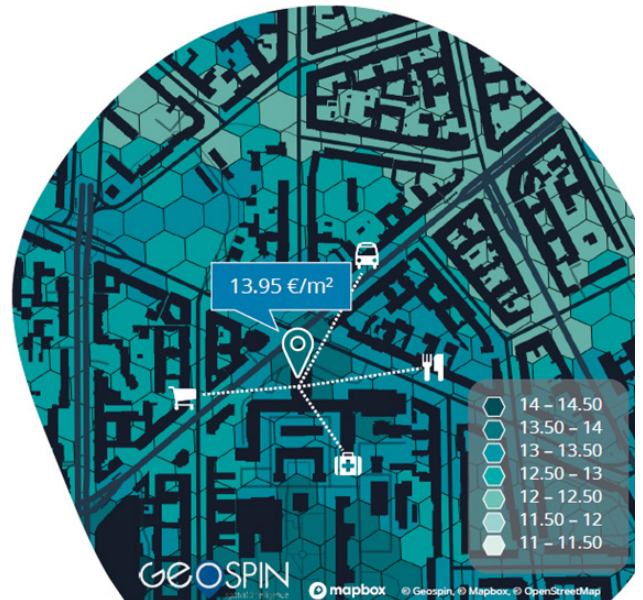


LEARNING FROM SAMPLES ...

Data rich location fingerprints incl. rents, points-of-interests (POIs) and socio economic features

Target area with unknown rents but similar location fingerprint

... TO PREDICT THE UNKNOWN



The AI learns geospatial patterns from data rich samples, allowing it to identify locations with a similar fingerprint and making predictions for those data poor 'digital twins'.

offers insight into the inner workings of a building, the concept of the learned "digital twin" focuses on the environment of a building. Here, the goal is to use information from data-rich areas to gain an understanding of relevant drivers and forces behind interesting market developments. This knowledge can then be applied to somewhat similar but data-poor areas. Based on the right data and on a machine learning algorithm, the computer will build a model. Afterwards, when provided with some basic information such as an address, the construction year and the condition of an object, the model will render valuable answers. Precise predictions of current and future rental values or recommendations for the highest yielding refurbishment options are just some of the potential use cases. To ensure efficient and effective processes, these prediction models will be integrated via API (often in the form of 'AI as a Service') into the workflows of real estate management software, feed planning or risk models. They will enrich reports and provide meaningful visualizations to human decision makers.

Explainable AI is trustworthy AI

Of course, replacing any blind spots with predictions from a black box AI is never a good idea. With so much at stake, investors will always ask why they should have faith in a machine prediction, especially if it is purchased externally as a service. Once again, technology comes to the rescue with a conceptual approach called "Explainable AI". In short, Explainable AI means that AI is applied in such a way that the results of the solution are easy to understand, as opposed to the predictions from a black box, as mentioned above, where the results cannot even be explained by its designers. Explainability is not just a regulatory obligation but can also provide trust and valuable business insights to businesses and end users. For instance, it will provide clarity on why one property is worth 15% more than a similar one nearby.

2021: the year of maturity

The year 2021 will initiate an era in which enhanced AI-driven location analytics for real estate will reach maturity and become suitable for the masses. It will become mature enough to be adopted by enough

users in order to make a real impact in the market. This will unleash its full potential for the first time. For those who have invested early, time- and cost-intensive data gathering, and cleansing efforts will eventually become a thing of the past.

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Innovation & Construction in the Shade of Global Crisis

Two technology trends that will move the real estate construction industry forward



The COVID-19 crisis has shed light on another well-known crisis that has the potential of exponentially harming humanity to a point of no return - global warming. If we want to avoid the many consequences of global warming, we should accelerate our efforts, starting now. How can digitalization and innovation enable the industry to prepare for a sustainable future?

Global warming and construction waste

The real estate construction industry is one of the biggest contributors to global warming. It is responsible for 40% of all global carbon emissions¹. With a percentage that high (compared to other industries), the Paris Agreement's² push to limit total emissions to 1.5 °C / 34.7 °F is particularly essential for this sector. Also, according to a report from Transparency Market Research, the volume of worldwide construction waste is predicted to double to 2.2B tons by 2025.

Crisis: a catalyst for change

The good news is that in a reality where construction is riddled with inefficiencies, such as wasted energy, high costs, lower profit, and material waste, there is room for significant improvement. Moreover, crises can be profound **catalysts for change**. They can create opportunities to gain a new understanding of how the industry

operates, and momentum to implement new approaches to manage long-time practices. Disruptive technologies have the potential to provide the efficiency, productivity, waste control, and more that the industry has been seeking for decades. In this article we will focus on two technology trends – Robotics & Automation, and Management Tools for the Construction Site – and how the implementation of these trends will move construction forward into a more sustainable future.

Robotics and Automation

The 1960s saw the launch of the first Industrial Robot – “Unimate”³. It was the first step towards progress, transformation, and foresight that brought us to where we are today. Still, despite advancements like Unimate, automation in the real estate construction industry is often challenging. Construction sites are full of surprises and uncertainty, and workers continue to

operate under extreme and frequently changing conditions. It is still a labor-intensive industry, where implementing automation is deemed essential. The industry's low productivity, specifically low labor productivity, is one of its biggest showstoppers, effectively putting a brake on further internally driven innovation and digitalization, and so it has become increasingly difficult to meet the growing demand in the market.

1 <https://www.worldgbc.org/news-media/WorldGBC-embodied-carbon-report-published>

2 <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

3 <https://www.invent.org/blog/inventors/George-Devol-Industrial-Robot>



A few examples

Therefore, technologies that can replace these traditionally physical tasks are on the rise. A number of companies develop intelligent, mobile, multi-purpose, and autonomous robots for use in construction sites. Some focus on wall rendering (e.g. stucco, exterior insulation and finish systems, concrete, primer, and adhesives), others automate the construction site layout process with a mobile robot. Drones are another pivotal trend, e.g. for the collection of high-resolution data to generate field intelligence, or to improve land surveying services (especially in infrastructure). AI and Machine Learning will automate many construction tasks in unprecedented ways. For instance, there are startups that use AI and an IoT platform on cranes to transform any site into a smart, data-collecting field, automating decision-making tasks on-site.

Management Tools for the Construction Site

A large amount of construction waste is due to poor management. 38% of construction management professionals consider poor processes and procedures to be a vital cause of technology failures⁴. 45% report that they spend more time than expected on non-optimal activities⁵. Adopting many of the emerging digital technologies on-site could enhance the rise of smart project management. These technologies, combined with real-time data, could enable ground field managers to make better informed decisions around scheduling labor and materials for a particular project.

More examples

For instance, software has been developed that creates a “digital twin” of the construction site using hardhat-mounted 360-degree cameras. These allow project managers at construction sites to get an overview of the state of a project and whether it remains on schedule. Another helpful innovation is an automated cloud platform that was designed and built for infrastructure construction projects. It enables real estate construction companies to monitor project progress, ensure quality, and control budgets based on actionable project execution metrics extracted from field data.

Moving forward

Though these technologies are impressive, they will end up being wasted if they are not accepted and ultimately utilized by the people in charge. They will not simply catch on. Innovation has led real estate to new heights before, and we must be open, receptive, and critical (when necessary) to technology that could further improve the industry. COVID-19 will probably end like other pandemics before. However, global warming is quite another story. When it will hit, it will hit hard, and with long lasting consequences. Innovation and the implementation of new technologies could be our “vaccine” to help us prepare for the next crisis to come, and enable the real estate construction industry to thrive.

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4 <https://jbnknowledge.com/2019-construction-technology-report-survey>
5 <https://www.plangrid.com/ebook/construction-disconnected/>

The virtual office for Corporate Real Estate

Where right sized workforce meets best fit workplace



The widespread adoption of remote working in 2020 has greatly shifted the role of the workplace within organizations. All indications point to a future where hybrid working is here to stay, as employees reap the benefits of greater choice in their working week and employers re-examine their real estate requirements. So how do real estate owners respond as the virtual office becomes a key component of working in the "new normal"?

Remote working is nothing new

Although the transition into remote working during 2020 has been tough for individuals, teams and organizations, it's nothing new. Since at least the peak oil crises of the 1970s organizations have been grappling with the idea of both geographically distributed and remote working. Advancements in personal computing and the internet have meant there have been few technological barriers to this phenomenon. COVID-19 has ultimately been the trigger for a widespread shift to take place, as an enforced critical mass of remote working to prioritize worker safety has forced us to overcome the perceived cultural barriers towards it. Now that remote working has become largely normalized, the traditional notion of a workplace could be changed forever.

Reimagining the role of the office

Mass adoption of remote working offers organizations the chance to reimagine the role of the office in a new real estate operating model. 2020 has witnessed the rise of the local community: a trend which looks set to stay, as people enjoy

shorter commuting times and the chance to spend more time connected to their local area and its people and businesses. Organizations will look to a distributed real estate model, diversifying their office space mix across both a central CBD hub and co-working spaces or smaller offices in suburban and regional areas. This will allow staff to leave their homes to experience a greater separation between home and work life and connect socially with colleagues, while avoiding long commutes. This makes a lot of sense as people also become increasingly aware of climate change and make conscious decisions to reduce their carbon footprint. Office spaces must be smart and flexible enough to facilitate these changes, as data becomes a critical component of workplace innovation.

Data is crucial

Data has a crucial role to play in the emerging workplace, driving the success of spaces, just as it does for the digital world. Workers will need to be equipped to seamlessly transfer between physical and virtual settings to work effectively with colleagues regardless of whether or not they're physically co-located. Smart

building spaces equipped with a multitude of sensors are providing organizations with increasingly large volumes of real-time data on their workspaces. The more data-rich our spaces become, the greater value we can extract from them, driving up the cost per square meter of premium smart offices. Organizations will need strategies to effectively utilize this data to extract maximum value, resulting in a shift from a 'set and forget' approach to workplace design of the past to make spaces hyper-flexible and responsive to real-time needs. Concurrently, cyber will play an increasingly important role in organizational data security across the virtual office, enabling an efficient, hybrid workforce to work securely.

Best practice: Australia's Virtual Office

Our own thinking in this space comes as a result of the success of Deloitte Australia's Virtual Office. A small, dedicated team was created during mid-2019 with a human-centered approach to first understand and then deliver solutions for the remote working needs of the firm's staff. Providing greater optionality to the staff was a key driver for the team's work, providing key



resources, training and information to uplift our staff's remote working experience, regardless of where they choose to work from, including the new Melbourne and Pyrmont office spaces.

The time to embrace change is now

As the dust settles on a tumultuous year, the one factor that's emerging loud and clear is the groundswell of support for hybrid working to continue into a post-pandemic future. With remote working experience under the belts of nearly every organization globally, the time to embrace change is now. Real Estate operators can get ahead of the curve, adapting traditional approaches by reimagining the role of the office and their operating models by keeping employee choice, community and data front of mind. Hybrid working is here to stay, and those that embrace the resulting changes will reap the rewards.

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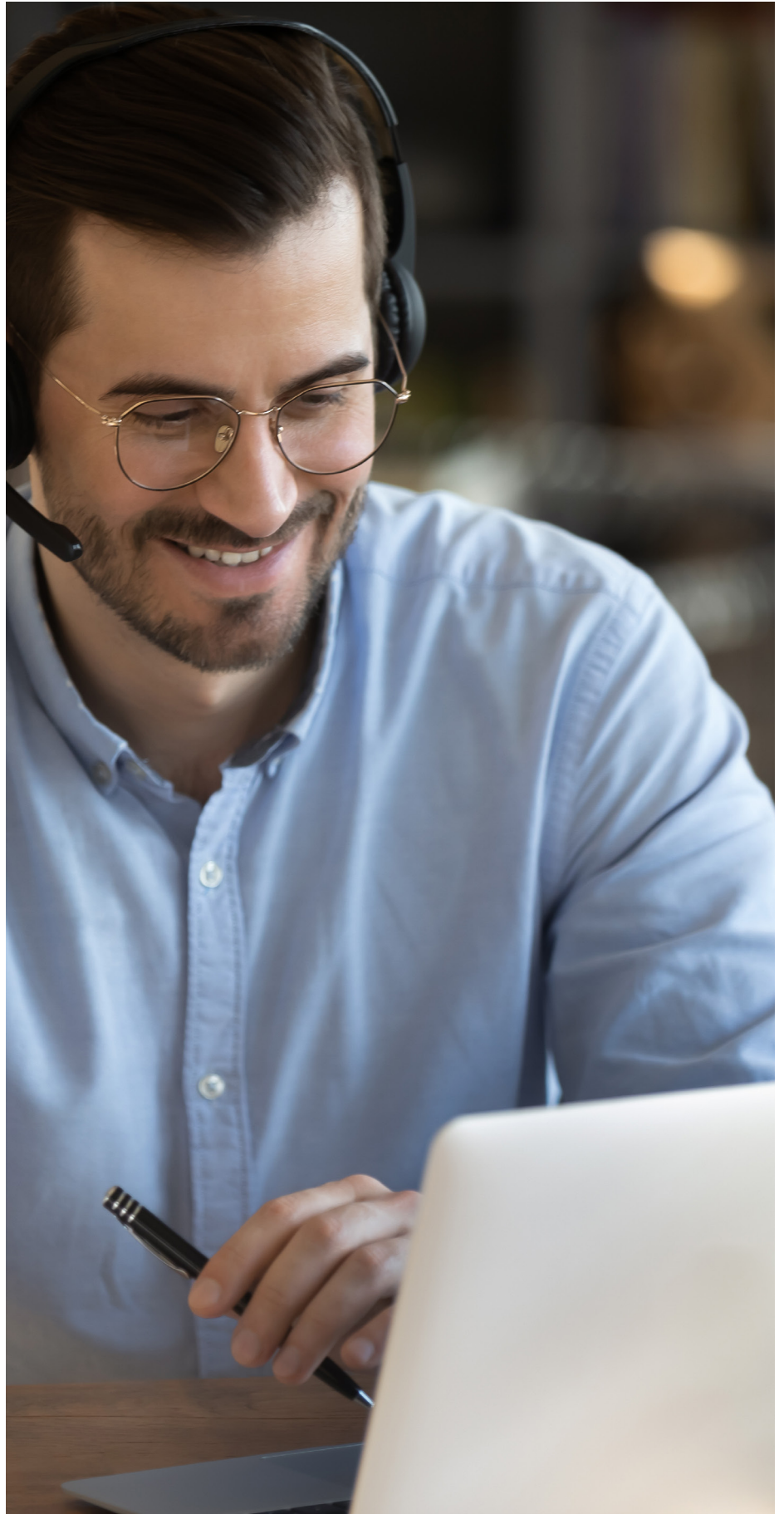
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Real Estate-as-a-Service: From “product and space” to “system and service”

A new business model for commercial real estate



Real estate is undergoing a fundamental business model redesign enabled by digitalization and a growing market of smart buildings. A redesign that is important in a (post) pandemic era when so many businesses are evaluating what their property brings to the company by providing on-demand, customizable and scalable access to space, amenities and services. What business model will be successful in the future? What can the real estate industry learn from tech? What is Real Estate-as-a-Service? And what is the impact on strategy and organizational performance?

In a world of bits and bytes, the value of Real Estate for businesses is increasingly determined by a different yardstick. Square footage is being replaced by data, and services that enable work are taking the place of the traditional space to work. Where the adage for property value once declared: location, location, location, the reality of today's real estate is location, insights, experience. To unpack this further, property owners need to consider how the space is being used, not whether it is being occupied. Real Estate-as-a-Service (REaaS) creates the conditions for property owners to ask themselves what the real value of their property is. REaaS, an innovation that is being enabled through smart and connected buildings, augments bottom line benefits from savings to new revenue and shifts the value focus from offering space to offering digital and physical services to users.

The evolved Real Estate value proposition

In the era of the “new normal”, work doesn't strictly depend on office space. The function of corporate real estate has therefore evolved from somewhere to work, to a workplace that enables users to perform better than they would do anywhere else. It is a place of high impact and superior experience, offering a curated and scalable “homefield advantage” to businesses, and transforming real estate from a “space to work” into a “business tool”.

Updating the business model: becoming a service provider

Enter “Real Estate-as-a-Service”, or REaaS. The term “As-a-Service” became mainstream through high-speed connectivity whereby technology companies leveraged their infrastructure and software, offering an alternative model for use by targeting consumer behavior,

as opposed to monetizing the product. REaaS generates revenue based on the outcome of improved experience and productivity. These improvements are provided to the occupants working in the connected building, where each digital service to support outcomes is charged for on demand.

Lessons from the tech industry

To understand the evolved business model, the real estate industry can learn new ways to generate revenue from the tech industry. Internet-based and physical “sites” have similar requirements: people amassed in a single location in need of a personal outcome with predictable frequency. “Locality” is leveraged to support experience, productizing the user rather than the infrastructure. Value emphasizes rendering services to support what people do and how they do it, instead of just where they do it. Real estate is therefore transformed from “fixed product”



(space and infrastructure) to “connected system” (information and services).

Smart building: connecting users and occupants to services

The location where people work is de-prioritized, whereas the smart building connects users and occupants to services, so that work becomes more advanced and connected to benefit the business. User output is monetized through services that leverage the physical infrastructure as an enabler. This fundamentally changes the business model of property owners who are now in the position to become service providers as custodians of physical and digital infrastructure.

Understanding digital services in real estate

The smart building creates conditions to aggregate and contain all building data. These are used for targeted analytics to inform decision-making. The data is contained within a digital platform and can therefore be leveraged to provide customizable features and services. A service is defined as the provision of information that is contextual or personalized to any customer or user. A digital service is one that is commoditized and provided electronically across multiple platforms such as internet or mobile devices. Digital services include e.g. insights through analytics, features and facilities rights management, location-based services, and a digital marketplace for third parties. They can be monetized in various ways, offering additional revenue to property owners and tenants – e.g. by means of subscriptions, consumption-based models, data monetization, API monetization, digital marketplace, and marketing & advertising.

Improving organizational performance

In order to deliver a digital service, the provider must be in control of the flow of data to the end device that benefits the user (e.g. a mobile device, lighting, or audio visual equipment). In real estate terms, this will incentivize the property owner

to take direct control of provisioning the infrastructure that is typically fulfilled by a tenant as a part of their initial fit-out. This creates a technological backbone that not only renders basic connectivity and functionality (e.g. lighting and Wi-Fi), but also helps tenants to improve their organizational performance – by means of data about how the space is being used and by whom.

Digital Masterplan and Platform Strategy

To exploit the potential offered by REaaS, a Digital Masterplan and Platform Strategy is required. This masterplan can act as the architectural design for smart buildings, avoiding the pitfalls of capitalizing separate point-solutions that provide limited benefits outside of core functionality.

A masterplan will:

- align the connected building to the enterprise architecture of the tenant or occupant
- define and design what data is required, how it is generated and analyzed
- support the revenue model, and
- determine the infrastructure required to support the digital agenda and the features that support the digitally augmented Real Estate.

REaaS combines and cross-leverages capabilities across systems to enable platform-based features and analytics that were not possible before. This platform unlocks the potential to sell these features and services to end-users. This will enable businesses to quantifiably improve their experience, productivity, and space usage, and it will help property owners transform from their “product and space” offering to a new value-adding and future-proof role as a service provider.

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The impact of social good on real estate

ESG as a value driver for real estate



“ESG”, the generally used acronym for “Environmental, Social and Governance”, has become an important business consideration all around the world. For instance, real estate investors have an increasing focus on sustainability. However, ESG in real estate can be so much more impactful. How can it become an important value driver?

ESG and real estate

Once upon a time, real estate embodied the epitome of capitalism. The trend, however, is growing quite the opposite way. The application of ESG standards on real estate (notably by governments and developers in many developed countries) has shown that this asset class is also relevant when these guiding principles are being applied. Awareness is growing that real estate can have a significant social impact either through the form of rehabilitation of public spaces (indirectly attributing value to existing real estate), affordable housing, social housing, and care centers, or through an environmental focus investment on new buildings such as green buildings.

Vital for investors

The correlative appetite that investors have for ESG, closes the loophole where more (long term) value is attributed to real estate assets. Medium-to-long term profit is therefore considered and kept with the usual lower risk volatility of a real estate asset. Sustainability has become increasingly vital to real estate investors. This is evident from the development of the Sustainability guidelines of the European Association for Investors in Non-Listed Real Estate Vehicles (“INREV”)¹

to also adhere to investors’ needs. Another indication is the increased participation in the 2020 GRESB real estate assessment. This is the investor-driven global ESG benchmark and reporting framework for listed property companies, private property funds, developers and investors that invest directly in real estate². ESG is therefore here to stay and will increasingly shape and influence real estate valuation, and therefore real estate investment, as investors wish to allocate their commitments under this banner.

Impact on the community

However, the impact of ESG on the real estate industry goes beyond what is mentioned above. ESG, aside from fostering eco-friendly buildings, also allows space to include considerations about the impact of properties on the community, covering aspects like diversity. The real estate industry must respond to this challenge by creating opportunities through social impact investing, like multi-tenant shared spaces or the transformation of underutilized buildings into enthusiastic venues. In practice, the major obstacle is that investors will need to reinvent their traditional investment models to match the needs of the local community.

ESG and infrastructure

Obviously, real estate and infrastructure are closely related. For example, the real estate industry is a major consumer of energy. Therefore, the construction of more sustainable buildings, e.g. by means of new eco-friendly materials or smart technological heating or ventilation, not only helps the environment, but it also boosts the return of the respective real estate investment, improving investment performance. Governments around the world are increasingly fostering these new construction methods to improve the carbon print of cities and emissions mitigation. As such, it is also relevant to take a quick look at the impact of ESG in infrastructure.

“Sustainability is here to stay or we may not be”

Niall FitzGerald

1 <https://www.inrev.org/guidelines/module/sustainability#inrev-guidelines>
2 <https://gresb.com/2020-real-estate-results/>

Overcoming new infrastructural challenges

Implementing an efficient ESG-focused infrastructure system is vital for undeveloped countries – it provides access to the most basic services like energy and water for the community. Also, for developed countries, it may help to face new challenges, such as the increase of population in urban areas and the environmental concerns. Additionally, ESG standards are already proving to be decisive in infrastructure closings. This is because investments are beginning to face community oppositions, which is often due to the lack of ESG considerations, resulting in costly delays or changes to the initial project.

Smart cities

Another expression of the ESG impact on infrastructure is the so-called “Smart cities” initiative, which refers to urban areas for which different innovative technological methods are designed. The output generated by such methods (e.g. in the form of data or statistics) can assure that city infrastructure is managed and organized more efficiently. Most of these methods are nowadays designed to allow ESG guidelines to span across the life of a city, in the respective assets, community services and resources, including better (and greener!) transportation, improved communication networks, optimization of energy consumption, water supply, crime detection and waste.

Some examples: Dubai, Singapore, and Luxembourg

A successful example of a smart city is Dubai³, which is tech-innovative in various sectors. A few examples:



transportation: development of the first hyperloop between Dubai and Abu Dhabi and of autonomous air taxis



tourism: project Oasis Eco Resort which aims to build a sustainable complex in the middle of the desert



housing: project Martian city aimed at building houses in the desert for 600,000 people as a start for a 100-year Mars colonization plan



energy: a mega solar park with the aim of making Dubai an eco-friendly powerhouse



security: development of self-driving police cars.

Singapore is also a pioneer in this field. It has introduced the broader concept of smart nation⁴. Some examples of ESG tech innovations in Singapore are the development of a cashless public transport, the digital engagement and transformation of healthcare (“Telehealth”), the development of a platform used as a channel between schools and parents (“Parents Gateway”), and the development of “Lamppost as a Platform”, i.e. a project which aims at maximizing the use of street lampposts to monitor changes related to environmental conditions, installation of cameras to analyze crowd build-ups and better monitor to increase safety in public spaces.

Finally, Luxembourg is also moving towards the concept of a smart nation. For a more specific analysis on the digital innovations on our jurisdiction, please see Deloitte’s article on this topic⁵.

The backlash from COVID-19

It is relevant to understand how these concepts will develop in the midst of a worldwide pandemic. There is no doubt that the current pandemic has so far affected how stakeholders look at vested assets and has slowed down further (real assets) investing. COVID-19 has severely impacted real estate valuations. Due to

the lockdown, site visits were hampered. At the same time, many transactions were put on hold as this pandemic seems to be shifting people’s demands for use of real assets, such as an increase in the search for bigger houses with gardens outside the urban areas, due to working from home. As much as the pandemic has slowed down economies and the real estate industry activity, the positive side of it is the wake-up call for investors to prioritize sustainable investments.

The environmental factor

In particular, COVID-19 has brought out the environmental factor by enhancing the urgent global need to decrease pollution and improve precarious sanitation systems. In fact, the initial slow start of the adoption of ESG standards was probably built on the erroneous perception that focusing on positive social impact would reduce financial return. It is becoming evident that it is indeed the opposite.

The social factor

However, the major spotlight is on the social factor: COVID-19 seems to be reshaping how the community should interact and behave from now on, which also calls for a reevaluation of the current transport, technology and health infrastructures. This said, more than ever, it is key that millennial investors - as well as governments - not only focus on traditional financial metrics but also on their ESG performance in order to create a positive long-term impact.

Recent global developments

This reality brings us also to the consequent topic of a global increase of guidelines and regulations related to ESG investments. The United Nations have outlined 17 sustainable development goals in the UN 2030 Agenda for Sustainable Development, which must be achieved for a more global sustainable future. Also, these goals represent the current challenges worldwide: poverty, inequality, climate change, environmental degradation, peace and justice⁶.

3 <https://scgn.smartdubai.ae/>

4 <https://www.smartnation.gov.sg/>

5 <https://www2.deloitte.com/lu/en/pages/public-sector/articles/luxembourg-towards-smart-nation.html>

6 <https://sustainabledevelopment.un.org/post2015/transformingourworld>

By adopting the Paris Agreement on climate change⁷ and the UN 2030 Agenda for Sustainable Development, the European Commission developed an Action Plan in March 2018 on different measures regarding financing sustainable growth⁸.

Transparency

As part of the Action Plan, Regulation (EU) 2019/2088 on sustainable Finance Disclosure regulation (SFDR) was published, which aims to provide more transparency on the degree of sustainability of financial products, to channel private investment towards sustainable investments while preventing green washing⁹. Its phase-in implementation will start on March 10, 2021. As a complement of this Regulation, the European Supervisory Authorities have developed a Joint Committee draft Regulatory Technical Standards (RTS) on ESG disclosures, for which a Consultation Paper was published in April 2020, seeking input on proposed ESG disclosure standards for financial market participants, advisers and products.¹⁰ Luxembourg is already taking relevant steps in this respect, such as the recent CSSF communication issued on December 16, 2020 on regulatory requirements and fast track procedure in relation to the SFDR Regulation.¹¹

European Commission

Also as part of the Action Plan, last November the European Commission launched a public consultation¹² on some of the criteria for determining which economic activities can qualify for the classification system for sustainable economic activities under the European Taxonomy Regulation¹³ that focus on climate change mitigation. Furthermore, the European Union published a Directive back in 2014, which requires big companies to disclose certain information about

how they operate and manage social and environmental challenges.¹⁴

More developments

Another recent development is the fact that there are countries that already officially recognize that climate change represents economic uncertainty and risk. One of them is the US, where the Federal Reserve included climate change in their list of financial stability risks (including real estate) in the Financial Stability Report of November 2020.¹⁵ Some countries are exploring the green bonds market, such as Luxembourg and Germany. In this respect also note that the European Green Deal Investment Plan of January 14, 2020 announced that the Commission will establish an EU Green Bond Standard (GBS).¹⁶ Finally, the European Union is currently reviewing the regulation for the collective investment vehicle, the European Long Term Investments Funds ("ELTIFs"). ELTIFs are funds that attract institutional and private funding to channel their investments into long-term assets, including real estate assets such as nursing homes, schools, prisons, and social housing. As such, ELTIFs can be a vehicle to enhance the access to ESG-focused investment.¹⁷

A successful "sustainability-proof" business

This said, it is expected that the regulation around ESG should continue to increase in detail. Investors will probably be impacted by ESG-related legal and regulatory disclosures, for which proper advising from experts may be needed. Also, there is no doubt that the global real estate market is already aware that ESG principles are key for sustainable investments. In fact, sustainable investing could soon become the standard way of investing. In order to achieve this, real estate investors

should ensure that the fund management is aligned with their intended positive social impact. At Deloitte we are looking forward on embarking on this journey with our clients to achieve a successful "sustainability-proof" business.

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7 https://unfccc.int/sites/default/files/english_paris_agreement.pdf

8 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0097>

9 <https://eur-lex.europa.eu/eli/reg/2019/2088/oj>

10 https://www.esma.europa.eu/sites/default/files/jc_2020_16_-_joint_consultation_paper_on_esg_disclosures.pdf

11 <https://www.cssf.lu/en/2020/12/communication-on-regulatory-requirements-and-fast-track-procedure-in-relation-to-regulation-eu-2019-2088-on-the-sustainability-related-disclosures-in-the-financial-services-sector/>

12 https://ec.europa.eu/commission/presscorner/detail/en/mex_20_2176#3

13 https://eur-lex.europa.eu/legal-content/EN/TXT/?toc=OJ%3AL%3A2020%3A198%3ATOC&uri=uriserv%3AOLJ_L_2020.198.01.0013.01.ENG

14 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0095>

15 <https://www.federalreserve.gov/publications/files/financial-stability-report-20201109.pdf>

16 https://ec.europa.eu/commission/presscorner/detail/en/fs_20_48

17 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015R0760>

Understanding Private Rented Sector property

Solving the structural need for rented housing in the main capitals



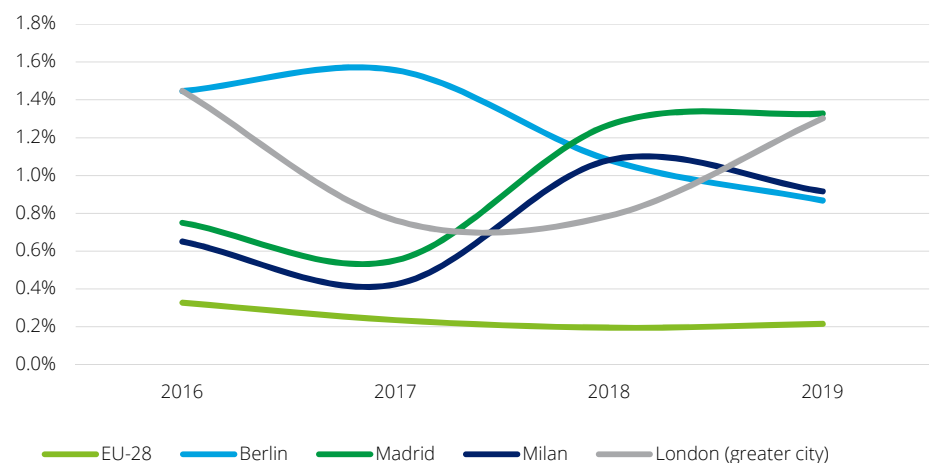
One of the megatrends in real estate is the need for rented housing in the main capitals. COVID-19 has accelerated this trend. The reasons behind the increased demand are the rising population, the fall in the average number of people per household, restrictions on financing combined with decreasing savings ratio and changes in habits. However, there is an insufficient and inadequate stock of rental housing, so a specifically designed product must be developed to match demand and offer new real estate opportunities.

Housing is a fundamental right that is included in the constitution of the EU and in those of its member states. Over the last few years, the demand in the rental market has increased dramatically, not only in Europe but also in the rest of the world. This is a result of population increases in the main urban areas and the rise in the number of households due to the decrease in their average size.

Another contributing factor is the greater difficulty of access to the housing market due to financial restrictions and increasing prices and changes in life habits, especially among the new generations.

As a consequence of the structural lack of balance in supply and demand, the PRS (Private Rented Sector) market is expanding. In particular, there is an imbalance (shortfall) in social and affordable housing. The market requires new solutions to respond to these urgent needs. There will be a significant capital allocation to this asset class in the coming years.

Graph 1. Population trend of the main cities and the EU-28 (Y-o-Y)



Source: Eurostat

Megatrend: Household growth in main capitals

By 2050, 70% of the world population will be living in cities. The increasing demand for housing in these cities will be driven by three main factors:

01. the megatrend of population growth in the main capitals (see graph 1),
02. a continuous household creation in the main countries of the EU (see graph 2) and,
03. a declining number of average persons per household (see graph 3).



This is triggering the need for additional housing units that are smaller in size and adjusted to current needs.

The trend towards rental

Disposable income and effort rates are key in the shift towards the PRS market, driven by macroeconomic variables such as GDP per capita, employment and the savings rate. The increasing property prices in city centers, as well as restrictions on financing, mobility and changes in consumer habits have structurally enhanced the rental demand in Europe (see graphs 4 and 5).

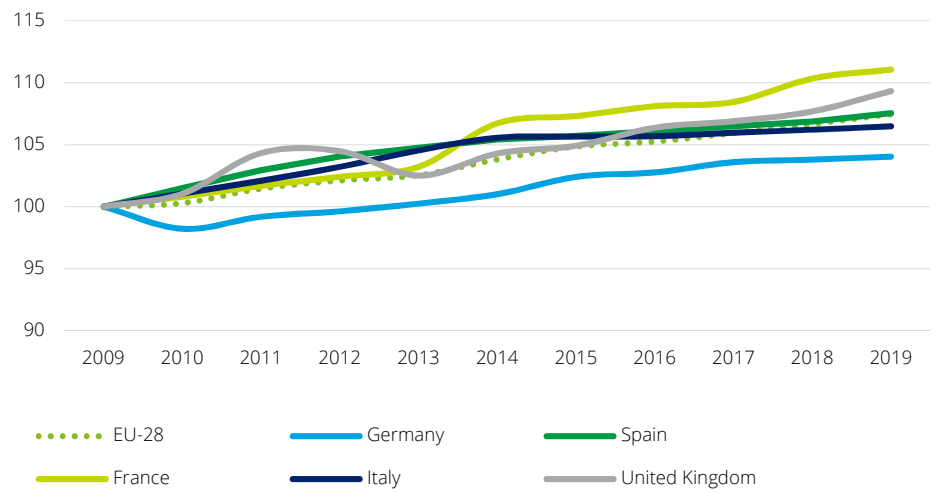
Affordable housing: accelerated by the crisis

The rental market across Europe is concentrated around young and low-mid income tenants. The global financial crisis has eroded economic growth, impacted employment and led to containment in salary growth, which has increased the demand from these tenants. Salaries in the EU countries rose with an average of 1.9% per year between 2014 and 2019, while the price of housing rose by 3.8% on average during the same period. This trend, combined with a decreasing savings ratio, is shifting demand from purchasing towards rental. The recession and economic uncertainty caused by the COVID-19 pandemic has accelerated this trend.

“Build To Rent” as a need

The need to develop an adequate housing stock that is specifically designed to meet rental market demand needs has led developers to use a significant portion of their stock of land to “Build To Rent” (BTR). Turnkey and forward purchase agreements have become an emerging trend. In Spain alone, the investment pipeline for rental platforms exceeds 30,000 units. BTR will continue to be a real estate trend through 2021 and beyond.

Graph 2. Number of households variation (2009 =100)



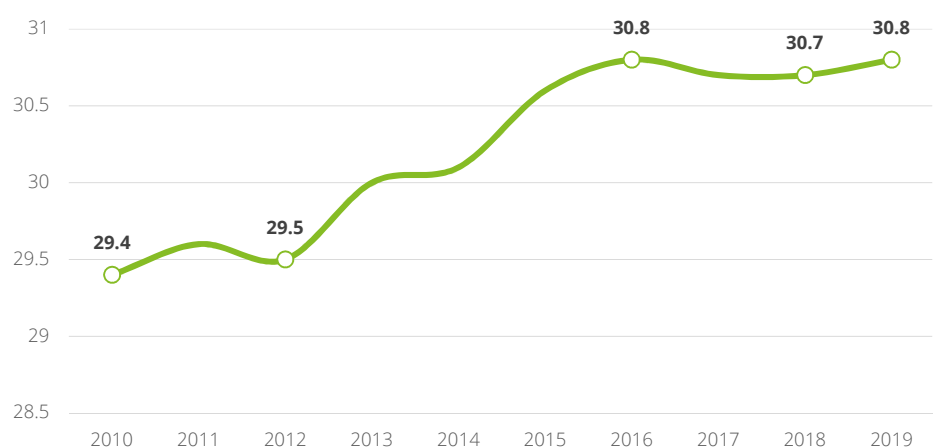
Source: Eurostat

Graph 3. Average household size of the main countries and the EU-28



Source: Eurostat

Graph 4. % households renting in EU-28



Source: Eurostat



Opportunities for investors

PRS offers an attractive risk-return profile based on the yield premium compared to risk-free (at maximum levels in the present context of interest rates). It has proven to be a more resilient asset class in times of crisis, with a lower performance volatility due to granularity. In certain markets, limited institutional competition presents a clear opportunity for the development and consolidation of platforms. If BTR is going to be structural, the key for investors is to ensure the operational capabilities (end to end) for the successful execution of the investment strategy - sourcing, development and operation.

Large investors, such as large investment managers, insurance companies and sovereign funds, are already taking advantage of key strategic markets, confirming the megatrend and converting PRS to the main asset class in the future.

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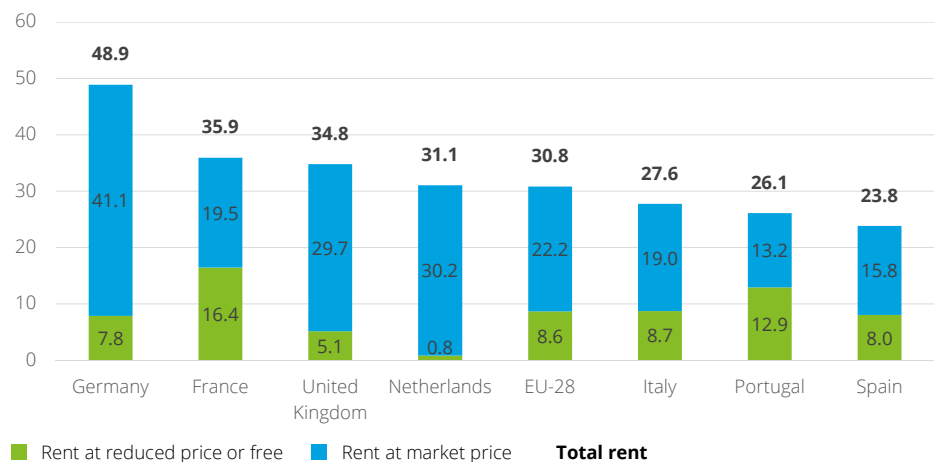
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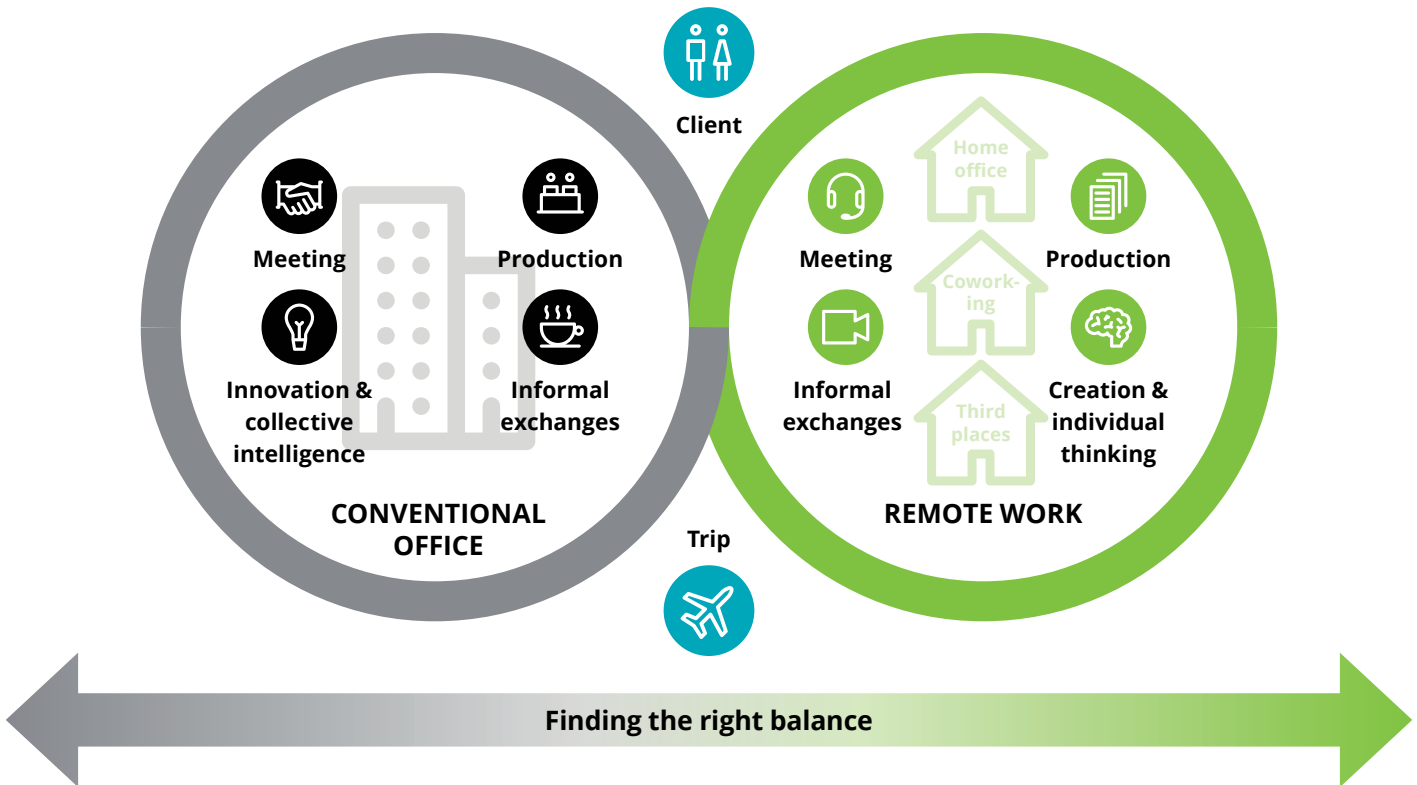
Graph 5. % households renting in EU (2019)



Source: Eurostat



Starting off from work situations, quality of the employee's experience and requirements of the business...



New spaces

Combined with a reduced footprint, corporates are facing market momentum to take on new space. Record construction activity in office buildings together with a slowdown in take-up has put pressure on rent (both headlines and economic) in a number of submarkets. This puts corporates in some submarkets in a strong position to negotiate for new spaces and for amending existing lease terms.

How to set up an action plan

01. Diagnosis

First of all, a comprehensive knowledge of real estate occupation in all its dimensions is vital. For instance, insight into the terms of the leases (to detect the negotiations levers, break option and expiry dates), occupancy ratios (workstation/m²), workforce, building efficiency ratios, total annual cost (per workstation and per m²), technical due diligence (CAPEX plans), fit out charter, and teleworking charter.

02. New reference system

The change to new ways of working must respond to concrete needs. Each person has their own set of rules, which will answer

several questions, such as: what are the reasons for going to this workplace? How can I keep my employees committed? What flexibility do we require in the organization of work? What will be the impact on the performance of my teams? This will enhance the right balance between face-to-face and distance and help to optimize occupation ratios. A set of specifications covering all the parameters will constitute the priorities that must be respected during the following steps.

03. Strategy

The cross-referencing of all these data, combined with the objectives and constraints linked to the corporate's strategy, will enable various options. The construction of the scenarios or business plans and the corresponding financial modelling will enhance performance management. These business plans will also enable the inclusion of market trends on a dynamic basis.

In this way, it will be possible to identify a priority path: either renegotiation of the current conditions with a potential surrendering of extra space (the "stay"

scenario), or considering a potential search for new premises, leaving one or more historical premises (the "move" scenario).

Anticipation is key

For such a structuring project for a corporate the key word is "anticipation". Deadlines may seem far away, especially the milestone dates for lease maturities, but such an optimization project, that will impact working methods, requires iterative and collaborative exchanges with all stakeholders. The world has seen a glimpse of the future of work in this COVID-19 era. What does this mean for the real estate industry? Real estate owners and their tenants who want to thrive in the near future, know what to do. It's time to act.

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Protecting your identity in the digital world

Self-Sovereign Identity and Real Estate



Identity is the essence of every individual. It defines who we are and differentiates us from others. In our societies, governments register our identities and issue proof of them in the shape of passports and drivers licences. If we were not able to prove our identity, this would impact almost everything we do, from going to the doctor, opening a bank account or renting a car to buying real estate property.

Protecting (proof of) our identity is extremely important in our society. However, we all rely on our government institutions to do so, without having control over our identity ourselves. But if we are in a sense the subject of our identity, why shouldn't we be in charge? Particularly in the digital world, identity theft or misuse is a serious risk, and interactions and transactions in the digital world have a serious impact for us in the real world. Self-sovereign identity is all about control over our digital identity.

The concept of self-sovereign identity

Self-sovereign identity could be defined as a model for managing digital identities in which an individual or business has sole ownership over the ability to control their accounts and personal data. The ten principles of Christopher Allen¹ are widely adopted as the basis of the self-sovereign identity concept:

01. Existence. Users must have an independent existence.
02. Control. Users must control their identities.

03. Access. Users must have access to their own data.
04. Transparency. Systems and algorithms must be transparent.
05. Persistence. Identities must be long-lived.
06. Portability. Information and services about identity must be transportable.
07. Interoperability. Identities should be as widely usable as possible.
08. Consent. Users must agree to the use of their identity.
09. Minimalization. Disclosure of claims must be minimized.
10. Protection. The rights of users must be protected.

Relevance for the real estate industry

What are current challenges and concerns with respect to the use of digital identities in real estate transactions? First of all, interactions with individuals around real estate are often very complex and time-consuming, with a large amount of paperwork. These processes are designed the way they are because of trust issues between landlord and tenant, owner and

bank or buyer and seller, due to potential conflicting interests between parties in a real estate transaction.

Example

For example, the buyer wants to make sure that the seller is indeed who he says he is, that he is indeed the owner of the real estate object and that he is entitled to sell the real estate object. Similarly, the seller wants to make sure that the buyer is indeed who he says he is, that he has the funds to buy the real estate object and that the funds come from a legitimate source. Today, these assessments require statements and proofs from governments, notaries or lawyers, land registries and banks. Issuing, collecting, sharing and verifying these proofs and statements, make these processes often inefficient for all parties involved.

Concern about personal data

Secondly, individuals are increasingly concerned about their personal data. For instance, 58% of Dutch citizens is concerned about privacy in general and

1 <http://www.lifewithalacrity.com/2016/04/the-path-to-self-sovereign-identity.html>



88% wants more control over the data they provide to companies.² Also, organizations are increasingly concerned about all the personal data they process from their clients because of the reputational and regulatory risks involved.

How self-sovereign identity can solve these challenges

So how could self-sovereign identity solve these challenges and concerns? Let's take a look at the example of John who wants to rent a house. Before doing so, John needs to prove to the landlord (amongst others) that he is credit-worthy to pay the rent. Today, John would have to provide e.g. an income statement, bank account details, and tax statements. This means he would share more personal data than necessary, and the landlord would have to

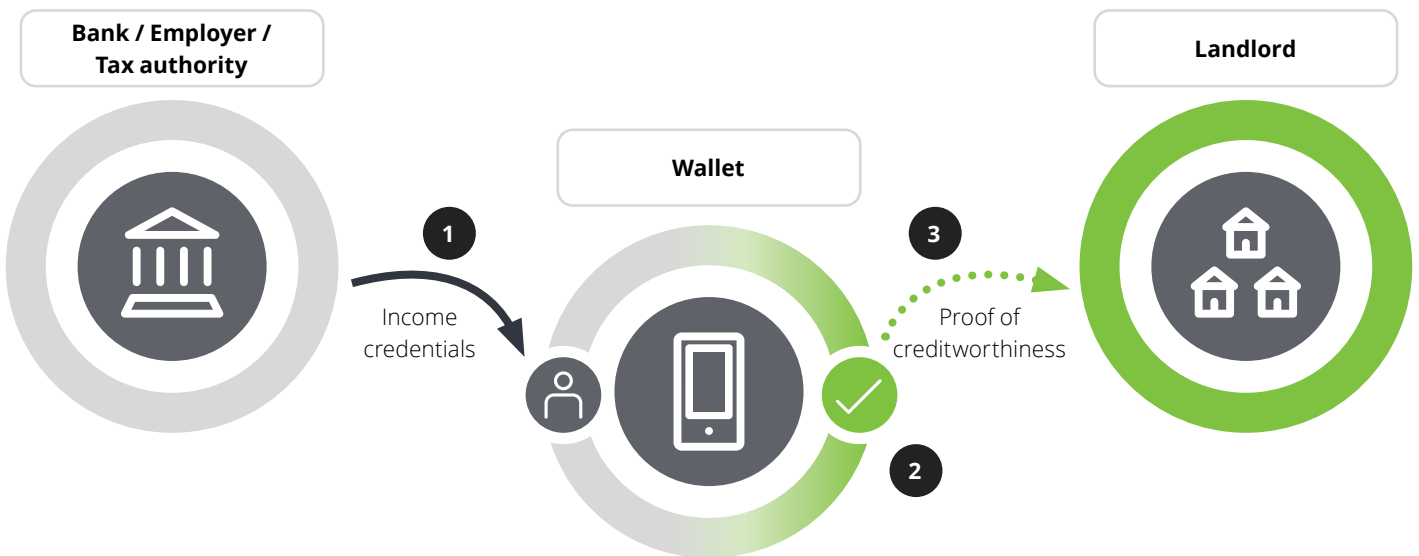
verify all the documents. However, if John used a self-sovereign identity solution, he could collect credentials about his income from his employer, his bank or the tax authorities in his digital wallet (or holder app) on his smartphone. He could review his credentials in his digital wallet and also perform an income check based on the criteria shared with him by the landlord. As a result, John would be able to share proof that he is creditworthy.

Self-sovereign identity as a game changer for the real estate industry

Will self-sovereign identity disrupt the way real estate transactions are being executed? We are without a doubt standing on the brink of a completely different way of personal data sharing, driven by inefficiencies and privacy compliance

risks in today's processes. In fact, major steps were taken in the development of self-sovereign identity solutions in 2020. An interesting example of its current application is the sharing of proof of a negative COVID-19 test or vaccination that Deloitte and others are working on.³ Experiments and pilots with self-sovereign identity solutions in real estate in 2020 have shown to be very promising. We therefore expect that self-sovereign identity solutions will be dominant in real estate transactions within two to three years.

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² <https://ddma.nl/download/81646/>

³ Deloitte is involved in different initiatives around self-sovereign identity, particularly in the real estate industry, e.g. with regard to solutions for rental, sale and mortgage processes. Deloitte is also involved in creating standards around a common self-sovereign identity infrastructure.

Improvise. Adapt. Overcome. How to cope with the impact of climate change

Climate adaptation strategies and real estate markets

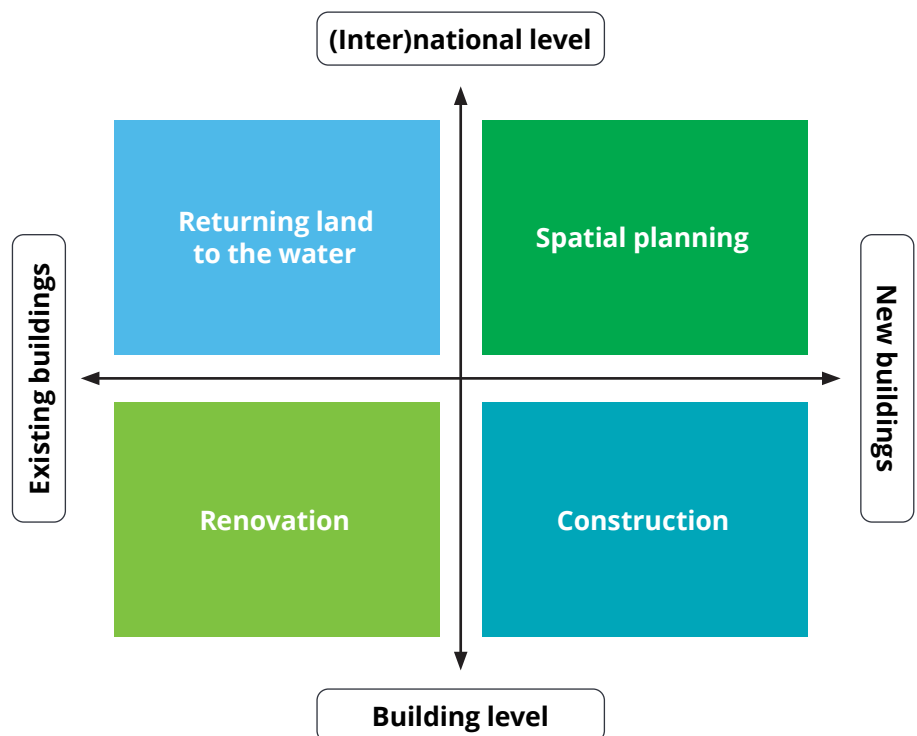


Climate change has consequences for nature, people, and therefore also real estate. Mitigation and adaptation are strategies to deal with the potential risks of climate change. What is the impact of climate change strategies on the future of real estate, in terms of markets, planning, construction, and renovation?

Strategies for reducing and managing the risks of climate change can be divided into mitigation and adaptation strategies.¹ Mitigation deals with the causes of climate change by reducing emissions. Adaptation is about dealing with the unavoidable physical impacts of climate change, such as heavy rain fall, heat, draught, subsidence, and flooding. These posed impacts can occur at different levels and have various consequences. Four different strategies can be applied: returning land to the water, spatial planning, renovation, and construction.

Returning land to the water

Due to increasing flooding risks, some areas will likely no longer be suitable for living, working and leisure, somewhere in the future. This challenges the long-term strategies for such areas.² Other examples are urban deltas such as Bangladesh, South Korea and The Netherlands, which are threatened by flooding, heavy rainfall and storms.³



1 OECD (2015), Climate Change Risks and Adaptation: Linking Policy and Economics.

2 For example: the plan to move the Indonesian capital Yogyakarta that made it to global headlines two years ago.

3 An urban delta may be defined as a city home to as many as half a billion people living and working in a deltaic zone where rivers meet the ocean.



Pros and cons

It could be legitimate to relinquish these areas. However, doing so will face political and societal resistance⁴, because of the impact on communities, socioeconomic structures and historical landscapes. In the case of the urban deltas the economic impact is huge, since a large part of the GNP comes from these areas. This far-reaching strategy is therefore only recommendable when safety is severely threatened and/or costs of conservation are too high. In the course of the 21st century, returning land to the water will become increasingly unavoidable and eventually accepted. Depending on the governmental strategies, this will influence real estate markets and investment strategies in the long run.

Planning

Next to "returning land to the water", another strategy is a renewed approach to "urban planning", like the planning and selection of future construction sites. We see an interesting example in The Netherlands. More than 60% of the land area of The Netherlands is prone to flooding.⁵ This concerns the entire Randstad area, with cities like Amsterdam, Rotterdam, The Hague and Utrecht, where more than half of the Dutch population is living and working.⁶ Planning for growth in peripheral areas (especially in the higher Eastern and Southern areas of the country) offer a long-term solution. The demand for housing in rural areas is increasing due to COVID-19 and working from home⁷, but the question is whether this constitutes a long-term effect, as a large population growth is still expected in the Randstad.⁸ Before, Dutch policies of spreading population and (government) jobs over the country did not substantially change people's preference for the (lower and dense) Western part of the country.

Construction

Next to the above mentioned two options, there is a third option: developing new "climate change proof" buildings and urban areas. Standardizing climate adaptive measures such as the installation of "green" and "blue" roofs and facades (absorbing sunlight and rainwater), using less glass (smaller windows and thicker walls) and using a light facade color, are some measures to adapt to climate change. More rigorous ones are building stilt houses or floating houses or installing a fuse box and electrical switches on higher floors in flood-prone areas. Depending on the measures, this might result in higher construction costs in the short term, but it will also increase real estate value and societal benefits in the long term, as well as decrease future replacement costs.

Renovation

Probably the biggest challenge for climate-adaptive real estate is the adaptation of existing real estate. Property owners will therefore need incentives to renovate their real estate in a climate-adaptive manner. Examples of these incentives are setting up a (revolving) fund, providing government subsidies and/or (favorable) loans, and specific regulations. Also, informing property owners of the possibilities of climate-adaptive measures (e.g. how to create green gardens) is essential. In The Netherlands, people are familiar with the concept of "cost recovery": costs incurred for public space (such as squares and parks) can be recovered from real estate developers in the case of (re)development. European equivalents are the "Community Infrastructure Levy" (Great Britain) and "Taxe d'aménagement" (France). It is possible to use this concept in such a way that it is applicable to real estate developers and owners.

Final remarks

Needless to say, each strategy requires a different approach, different partnerships and awareness of possible complications. In this regard, it remains important to always compare short-term solutions with long-term solutions. Not just for the benefit of the real estate owners, but also for its users.

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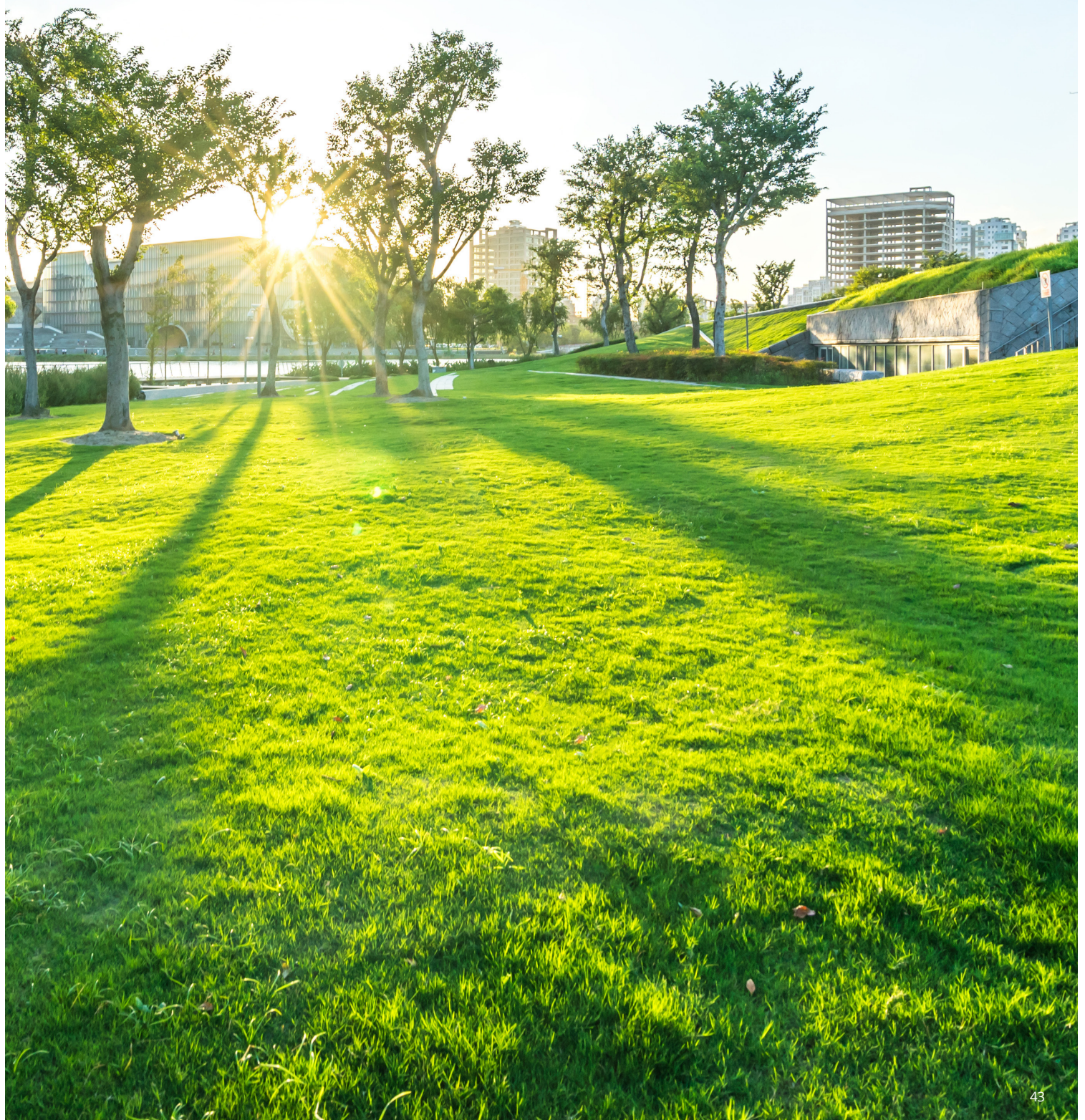
4 For example: in 2018 the Dutch High Council had to decide that the Hedwigepolder (approximately 2 square miles) might be flood, after years of political and public disapproval.

5 <https://www.pbl.nl/publicaties/overstromingsrisicozonering-in-nederland>

6 The Netherlands has 17 million inhabitants, of which approximately 9 million live in the Randstad.

7 <https://pers.funda.nl/192221-coronacrisis-verbreedt-horizon-van-woningzoekers>

8 <https://www.cbs.nl/nl-nl/nieuws/2011/41/forse-bevolkingsgroei-in-de-randstad-tot-2025>



Digitalization is here to stay

How to achieve an effective digital transformation in real estate



The real estate industry is currently adapting to evolving market conditions, a changing regulatory environment, and a fast-growing technological landscape. This development is described in detail in our recent 2019 European Operations and Technology Survey for Real Estate Investment Managers. A survey that was completed by a range of European real estate investment and asset managers, from the largest to the smallest, but that was surprisingly consistent. What can be learned from their replies? How to achieve an effective digital transformation in the real estate industry?

Key messages from the industry

The overwhelming message across Europe is that there is a drive to embrace and exploit digital innovation. More specifically key messages were that:

- The level of **interest in innovation** and the **use of disruptive technologies is very strong**.
- **Identifying inefficiencies and maximizing value** across all activities is a common denominator.
- The **digitalization of contracts/ documents**, big data and data analytics, as well as robotic process automation and AI, are increasingly becoming **a key target area for investment**.
- **These trends were all evident before COVID-19** caused a temporary upending of business life and pushed almost all participants into forms of remote working.

- **Increased digitalization of processes** and remote access to management information **is moving to the top of the agenda** for many more operators in real estate.

- The drive for **increased business resilience**, and the need to have managers able to **operate in as agile a fashion as possible**, should provide a **further impetus for change**.

This viewpoint is further supported by a recent 'Technology and the Future of Real Estate Investment Management' White Paper¹ that stated that 'as with other industries, digitalization is expected to lead to industry concentration', and that 'only 25% of real estate investment organizations currently boast an established data strategy'.

How to define digital transformation

A digital transformation can be characterized by six main elements:

elevated and frictionless human experience, real-time relationships, empowered employees, data-based decisions, on-demand delivery, and technology-enabled actions and processes. It is no surprise that the first three elements involve people. It is a common misconception that a digital transformation is all about technology. The success of popular applications is based on the level of adoption by people around the world, and the agility of the applications in maintaining relevance.

The impact of digital transformation within organizations

COVID-19 has proved the adaptability of businesses to react to the need for rapid change. Remote working, different retail models, the digitalization of contracts, and enhanced remote global collaboration are all examples of how companies have adapted - in some cases almost overnight. Due to this agility they have managed to offset some of the business disruption

1 <https://medium.com/pi-labs-notes/integrate-to-innovate-cf50c3b60366>



that might have been predicted from the pandemic, but obviously not in all cases or industries.

Digitalization must be value-enhancing and aligned to solving real business problems. Historically some technology has been implemented because businesses fall in love with the promised functionality and end up disappointed with the reality.

To achieve success, in all cases, strong leadership and sponsorship is a basic requirement. The implementation of new ways of working, which may not necessarily display a tangible benefit at an individual level, is tough to drive through an organization. In addition, a digital transformation may require completely different skills, such as those of data scientists, and may make some roles redundant. This is likely to change the dynamics of the workplace.

The internal impact of digital transformation is huge:



Both structured and, increasingly, unstructured data is used to drive more complex insights. While data quality and availability is often cited as the barrier to change, even with poor data, new analytical and stochastic techniques can enhance insight.

How can a digital mindset help?

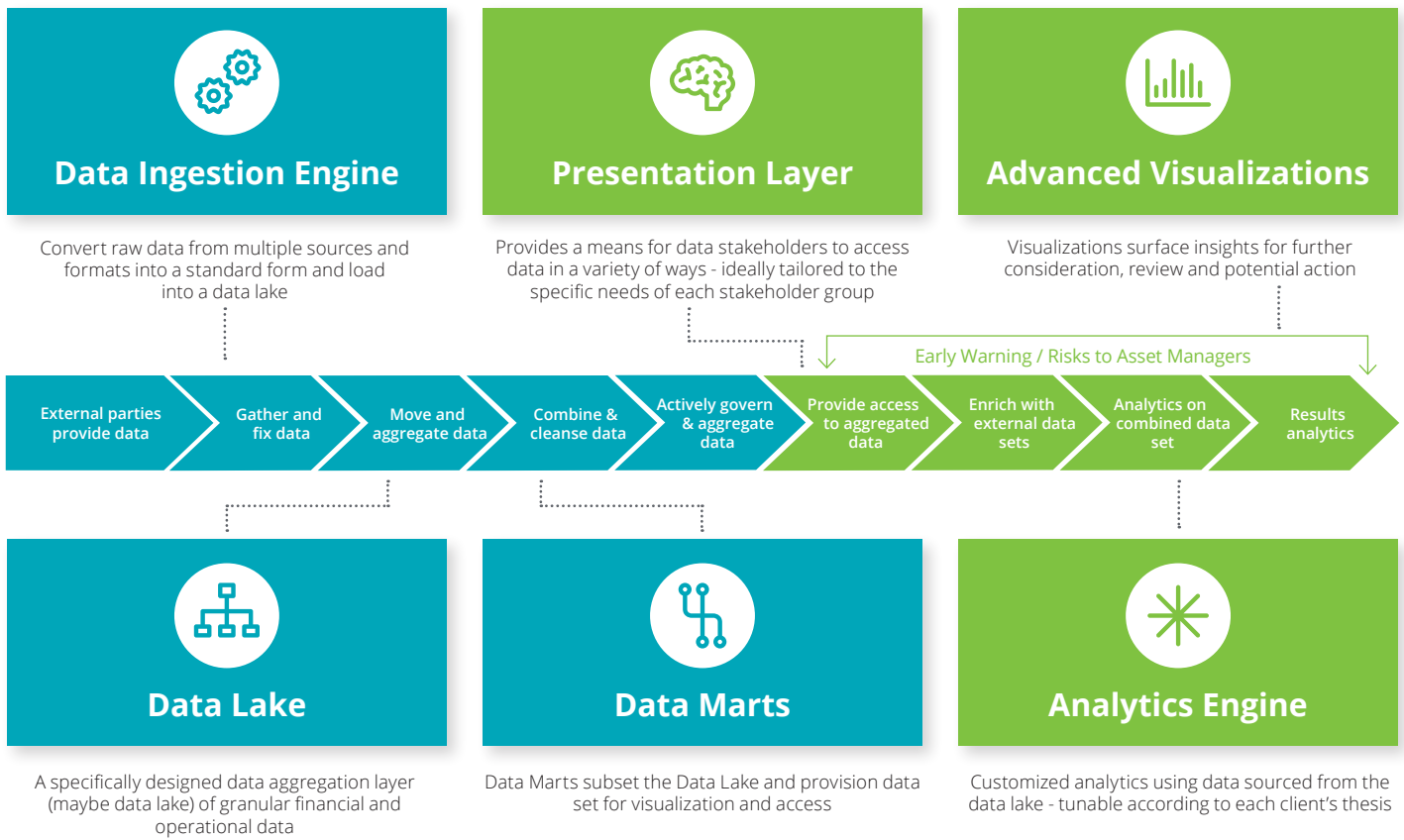
Digital transformation requires leadership alignment as well as a digital mindset - one that is comfortable with experimentation and reimagining ways of working. However, "being digital" is not as radical as it may seem. Yes, there are elements such as blockchain and machine learning that are difficult to understand conceptually. Yet in our everyday lives we already experience what being digital is like - with our mobile phones, digital watches, and "intelligent" household appliances. So transferring these concepts into a real estate business is not such a major leap as many might consider.

The next generation organization is likely to be one that can recognize value and move nimbly via its connected platform's capabilities. Such companies "make room for the machines" - they introduce robotic process automation, machine learning, and AI. Also, they create a connected "crystal ball" by means of IoT and predictive/prescriptive analytics, and big data helps them to see more clearly in the data depths. They "conquer data mountains" (data stewardship in the digital age), and extend beyond a strong core rapidly (by means of Platform as a Service Innovation). Finally, they create the connective tissue through cloud integration. All of these capabilities hinge on connectivity and seamless data integration, from both within the company, and increasingly from external sources such as macroeconomic and sociodemographic data.

How to make sure data flows seamlessly through an organization

There is nothing new about having data flows through a real estate organization. In its simplest form, data ingestion is a series of spreadsheets merged into one spreadsheet with multiple tabs. Data marts might be described as a look-up table from a spreadsheet. Presentation layers can be a PowerPoint with data cut from a spreadsheet. An analytics engine might be a spreadsheet Macro and advanced visualizations might be putting the data into Tableau or PowerBi. On this basis it is not surprising that Excel has maintained such a stronghold in this space and is likely to continue to do so in real estate.

What has changed, is that the tools available to real estate at each of the stages described above have increased beyond all recognition in sophistication and functionality. In addition, both the price point of such tools, particularly if they are on the cloud, and the ability to rapidly deploy them, using enhanced technology implementation approaches, offers new opportunities to exploit digital solutions.



As digital technology moves on, and blockchain is the obvious gamechanger, implementing long, complex programs should become a thing of the past. Applying machine learning and robotic process automation to support data ingestion, alongside complex data transfer engines, will radically improve the collation of both structured and unstructured data. The technology for data repositories is radically changing and it is now possible for analytics engines to use layers of AI. Visualization tools and the use of Digital Twins supporting advanced simulations will likely allow the digital testing of options, without expensive and potentially sub-optimal physical developments.

How to achieve an effective digital transformation

The real estate industry is beginning to understand that the market cycles for change are far shorter than before. Planning for digital change will occur on a 2 to 5-year time horizon rather than a more traditional 10 to 20-year basis. Roles are likely to change, and aspects of what organizations do today may either be automated or become commoditized.

The steps below should allow digital change to be embraced in a controlled way. This should help maintain the important aspects of a real estate organization such as culture and purpose, whilst exploiting the opportunities of a digital transformation.

Digitalization is here to stay

Digitalization is here to stay, and real estate investment, fund-, asset- and property managers can either embrace it or risk becoming marginalized within the market. It is a complex topic, but it largely relies on the willingness and ability of people to change rather than pure technology.



Organizations that are willing to experiment and be prepared to try, test and fail - and then try something slightly different again - are far more likely to take advantage of the new offerings than those who are cautious, risk averse and traditional in their outlook. The opportunity offered by digital solutions has the scope to radically change the way real estate professionals work. Therefore, we are entering one of the most exciting times in our industry.

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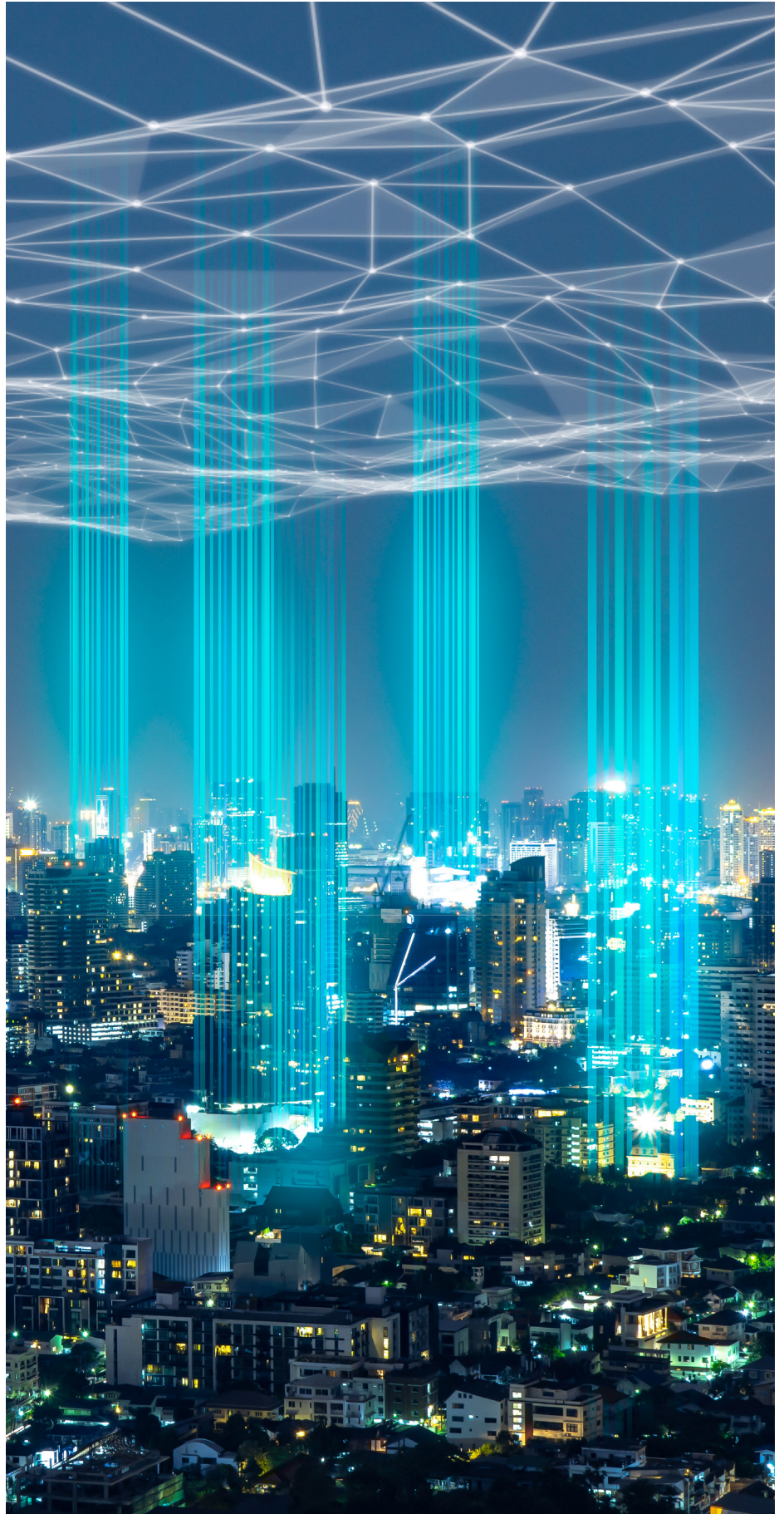
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How to support strategic decision-making in real estate

Combining Artificial Intelligence and real estate market expertise to enable forecasting

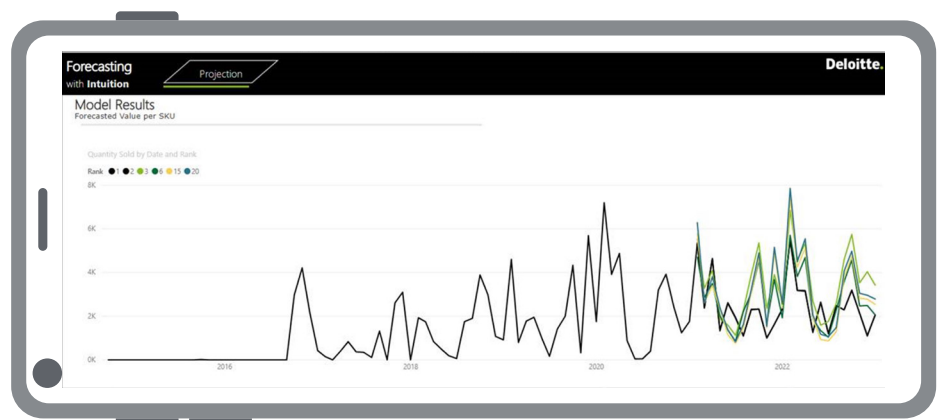


The availability of robust real estate market data varies across geographies. Incorporating disparate datasets into a forecasting algorithm, in a structured and standardized manner, enables the user to visualize how the different data layers interact in, for instance, complex environments such as an asset register for large real estate portfolios. The overarching purpose of enriching the data layer with as much internal, external and macro-economic data as possible, is to help understand the impact of future trends by feeding the forecasting process with more information. Ultimately this can arm decision-makers with customized, interactive analytics, made available in easily digested mobile formats, where needed.

Urban planning, asset management and investment decision-making require a thorough understanding of the current and future supply-demand dynamics and underlying macro-economic factors. The integration of Artificial Intelligence (AI) with real estate and financial planning expertise can help support new ways of analyzing historic data in an attempt to improve future decisions.

Four-stage approach

Integration is vital to the successful delivery of large-scale projects and should be implemented at the organizational, portfolio and asset lifecycle levels. Forecast algorithms and scenario analysis, such as those used by Deloitte's Intuition accelerator, can serve as important tools in considering and setting out the integration required for real estate planning.



Source: Deloitte Analytics



Stage 1: Data discovery

Reliable quality data is essential for a meaningful forecast model. First, we need to ensure that the data is cleansed, enriched and structured in a manner that supports the forecasting process. Also, it should enhance insights and connections. For instance, to study the change in residential prices, historic data on price performance, annual supply additions and investment yields can be enriched using macro-economic variables such as GDP and currency fluctuations. This will provide an additional dimension to insights and projections. The local real estate expertise plays a critical role in this stage.

Stage 2: Technical infrastructure

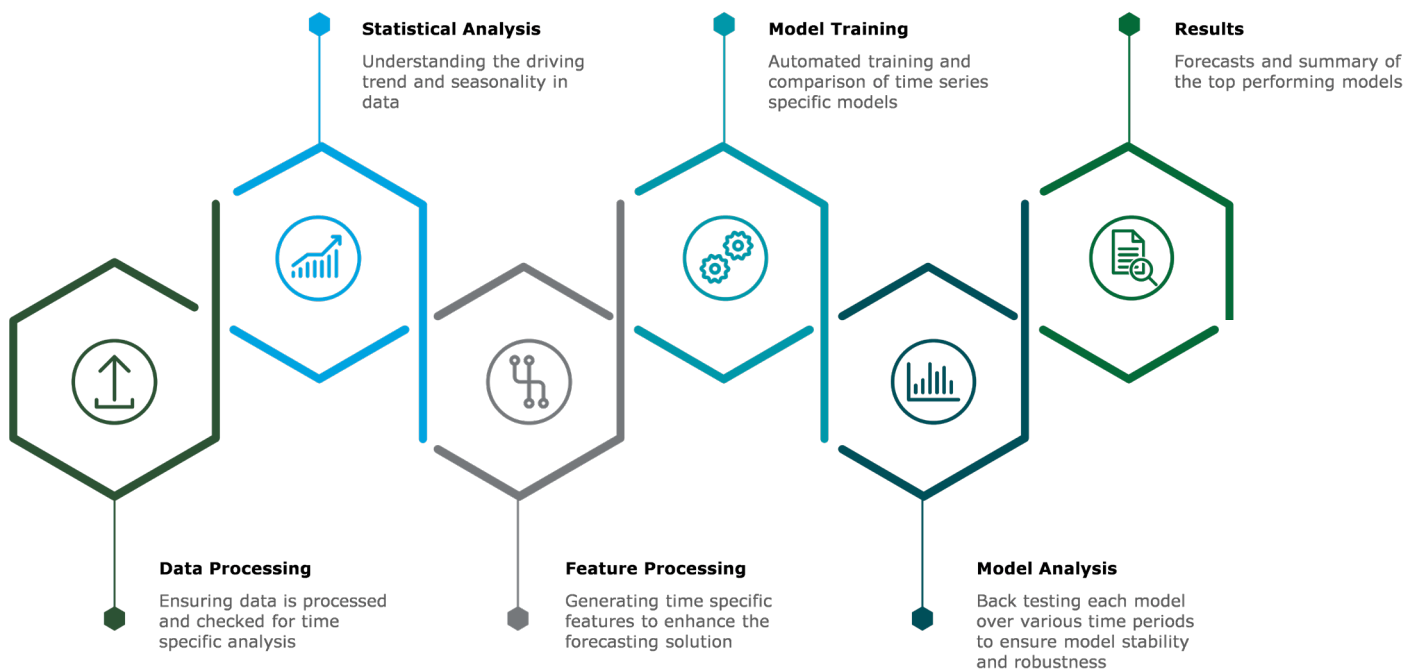
Technical infrastructure is needed to support the forecasting algorithms. This requires an understanding of the current state of supporting technical infrastructure, costs and compliance needs, to ensure that the tool is fit for purpose. Leveraging

cloud technologies is a way to significantly increase the speed and overall accuracy and decrease the overall cost of such a solution.

Stage 3: Forecast Algorithm and Scenario Analysis

A time series accelerator such as *Intuition* can automate the process of identifying unique and complex trends within a data set. Data is passed through different algorithms to pair the most predictive algorithm with the provided data. Additionally, the accelerator allows users to explore the effects of changing key metrics that drive the forecasts.

Through advanced pattern recognition and machine learning, the forecasting tool can support real estate strategy. It highlights previously unrecognized patterns in data and supports ongoing learning from those patterns.



Source: Deloitte Analytics

Stage 4: Consume results and influence strategy

Historically, AI-enabled tools have been more commonly applied in sales forecasting in the consumer goods and manufacturing industries. However, the capability also has significant potential applications in the real estate sector. For instance, a fully customizable consumption layer created as a bespoke solution for key stakeholders in the real estate development lifecycle can allow access to forecasts when combined with descriptive analytics to offer users a full view of the real estate landscape.

Supporting strategic decision-making

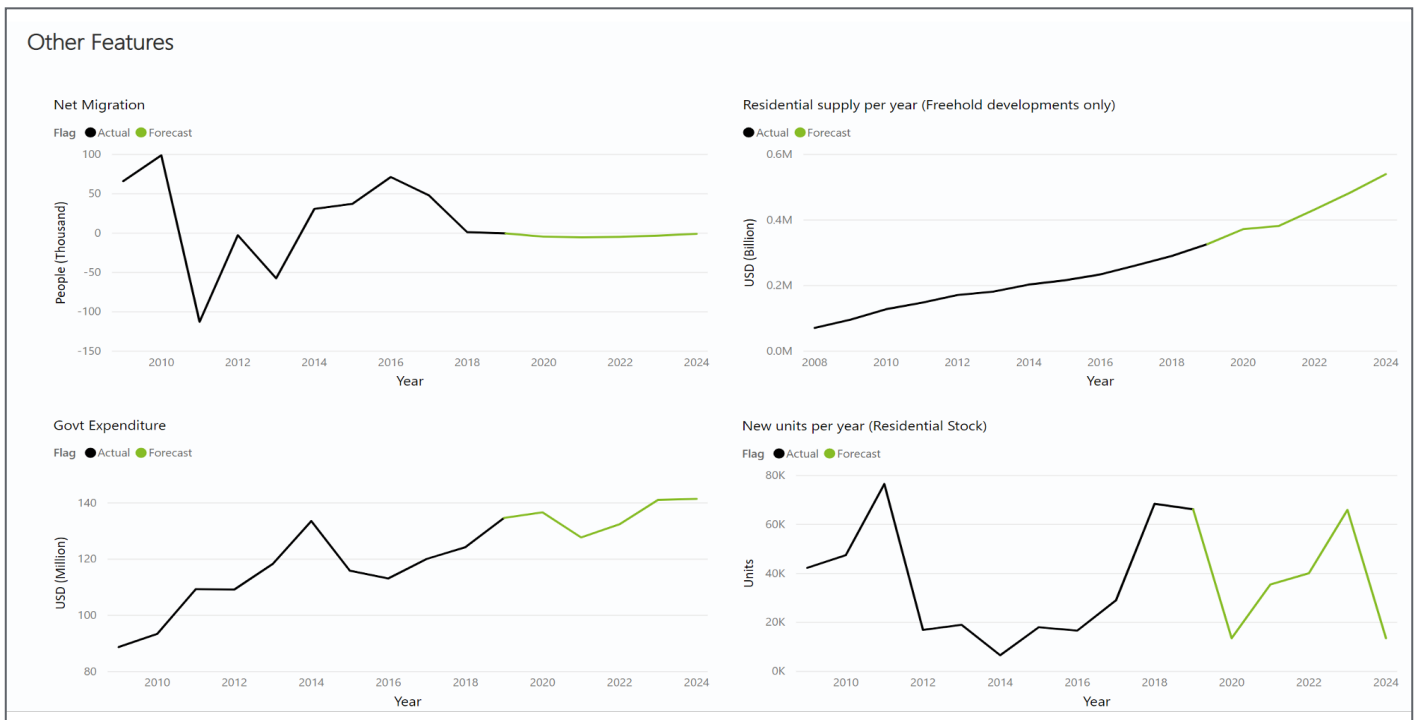
As a machine-learning based tool customized for the real estate sector, the entire system will get smarter and improve over time. In this way, it is able to link socio-economic factors such as the number of jobs by key economic sectors, with the real estate asset demand over time, to assess how this might impact future performance including price. The tool can also provide absorption forecasts for planned assets and help define the appropriate phasing strategy for each. Finally, the forecasting tool can be further integrated within business planning and financial feasibility models to drive a market-based response to real estate development. This will support future decision-making even more.

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