

JLL Future Vision

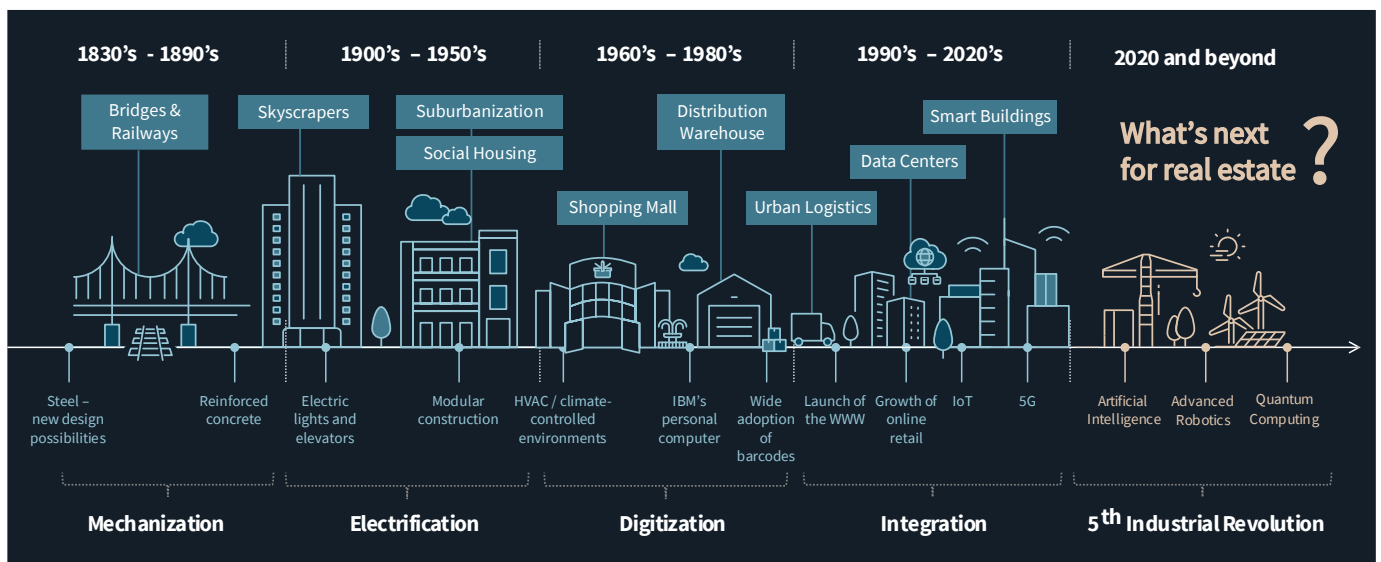
# Get set for the 5th Industrial Revolution

## Real estate strategies for an AI-powered world

### Key Highlights

- **Embrace the change.** The changes that AI and advanced computing bring are happening across all aspects of life. To turn this into an opportunity, companies must stay vigilant and closely watch where and how the impacts unfold in terms of real estate demand, design, function and business models.
- **Start preparing now.** Despite all uncertainties, act now to build technology capabilities in preparation for future AI integration through the entire real estate life cycle. Adopt a "fast iteration" approach to match the pace of technology.
- **Remain human-centered.** As our world becomes increasingly saturated with AI-generated content, physical interactions will acquire a new meaning and purpose. As space provider, real estate must keep a truly human-centric approach, crafting tangible experiences for a wide range of users with evolving needs and demands.

Technology has always been a driver of change for real estate. Just as the development of motor transport and e-commerce dramatically changed demand for preferred locations, asset types, investment strategies and design, so will technology advances such as Artificial Intelligence (AI), Generative AI (GenAI) and robotics.



Through 2030 and beyond, the human-machine interactions of the 5th Industrial Revolution will alter how and where we work, live, play and invest, with profound implications for real estate owners and occupiers. It means we must all now consider what success looks like for real estate in a scenario where AI is part of every aspect of our life. How can we turn the transformation into opportunity and stay competitive?

## **Where is change happening?**

We're already witnessing the growing influence of advanced computing and AI across all aspects of life, a trend that is expected to accelerate in the coming decade. Here are 6 key components that signal the direction and scale of how this change could play out.

### **1. AI and computing are converging with natural science and engineering**

AI is just starting to unveil its groundbreaking capabilities. Meanwhile, fully operative quantum computers are anticipated by 2035. These advances not only mark progress in their own fields but also hold the power to accelerate discoveries in green energy, new drugs, synthetic biology and robotics. Just like how MIT researchers used AI simulations to gather 100 days' worth of robot movement data in a mere 3 hours, advanced computing is reducing the time for scientific discovery from years to months, tackling energy crisis, diseases, even longevity – challenges fundamental to humanity.

### **2. With labor market shifts inevitable, productivity gains require strategic planning**

75% of global knowledge workers are already using AI. Over the next decade, the impact of AI on labor markets will gradually unfold through a complex mechanism of job displacement, creation, augmentation, intensification and matchmaking. Initial effects are already evident in the growing demand for AI engineers and the decline in back-office clerical roles. With sufficient productivity gains, AI could raise the income of most workers; however, the net effects on specific markets depend on sector composition and employment structure. Capitalizing on these gains relies on strategically reshaping job functions and investment in upskilling and reskilling.

### **3. Widespread adoption will drive changing behaviors in everyday life**

The focus of GenAI development is shifting from text to audio and videos. It is already possible to create digital avatars that look and gesture exactly like their human counterparts, finally making Metaverse a realistic idea. As the digital native generation matures, AI-generated content will pervade entertainment, advertising, gaming and consumer products, where personalized experience and intuitive human-machine interactions become the baseline expectation. Similar to how Marvel started using AI in filmmaking, content creation and consumption will take different forms, accompanied by significant advancements in AI hardware.

#### 4. AI safety and governance will take center stage as the cost of trust keeps rising

As deepfakes become a handy tool for criminals, the cost of trust in the virtual world keeps rising. Embedded biases and misuse of AI models are also likely to bring unintended consequences. To mitigate these risks, governments are accelerating AI legislation. With the EU AI Act as a significant milestone, we expect that by 2030, most countries will have AI-related legislation, driving transparency in the training and use of AI. Corporations are creating responsible AI guidelines, such as Rolls Royce's Aletheia Framework. Both public and private sectors are also working to protect consumers and businesses from fraud.

#### 5. Computing posts a significant challenge for resources

Computing is extremely energy hungry. The International Energy Agency forecasted that by 2026 the energy use related to AI will be equal to the amount used by the entire country of Japan. In response, various actions are underway, including data center redesign, on-site energy generation and clean energy sourcing. Companies such as Microsoft are exploring energy strategies such as the use of small modular nuclear reactors. Location wise, Google, Meta and Amazon have established data centers in the Nordics for its stable green energy and colder climate and in Southeast Asia for cheaper energy prices.

#### 6. Competition is fueling sovereignty in technology

Faced with geopolitical instability and supply chain disruptions, competition in AI and advanced computing will escalate in the coming years. The U.S. has invested in its chip-manufacturing capabilities with an expectation to produce 20% of the world's leading-edge chips by 2030. Meanwhile, China has set up a US\$47.5 billion state investment fund for semiconductors, and Malaysia, already the beneficiary of a US\$2.2 billion AI investment from Microsoft, is marketing itself as a "neutral" home for chipmakers amid US-China tensions. Concerns over where data is located is also impacting decisions on the technology companies that businesses choose to work with.

### **What this means for real estate?**

The signals outlined above show how the future might evolve, but what might it all mean for real estate? We examine this question through five lenses: demand, location, investment, assets and design.

#### **Demand: emerging and increasing user requirements**

As more activities move online and the risk of deepfake fraud increases, people will place greater value on face-to-face relationships. Demand for real experiences in physical spaces will increase, with adaptable

spaces designed to suit the needs of different generations and demographic groups, from younger digital natives to older people needing support.

Similarly, we'll see an increased requirement for space where experiences can be enhanced by AI and virtual or augmented reality. In this scenario there will also be a dichotomy between experiences and locations which are highly automated and those which are crafted to offer highly personal, tangible experiences.

Demand for computing infrastructure itself, such as data centers and chip-manufacturing facilities, will continue to grow, but with performance and climate resilience as key considerations. The scale of change in demand will depend on the sector composition and demographics of each market.

### **Location: macroeconomic drivers in markets**

New tech industries will need office, R&D, manufacturing and data center space. This will occur across markets, but especially in those which offer an educated and flexible workforce, the right environment for employees and access to power.

Government support may become an increasingly important factor in location choices as nations compete to attract new technology investment. Different nations may target different industries, providing land and materials for chip factories, clean energy for data centers or university clusters for life sciences companies.

Access to power and water, especially clean and renewable energy, will be an important motivation for tech firms, especially power-hungry industries like AI. While environmental concerns are growing in importance for tech firms, price, security and availability of power will be paramount.

There will be a bifurcation of data center locations. Large facilities will cluster where there is space and power, but applications such as autonomous vehicles, streaming and gaming require 'edge' data centers close to the user, to reduce the lag between digital command and result. This means demand for smaller, urban data centers will also increase.

### **Investment: new models for capital**

The digitalization of investment decisions will be enhanced by AI, which can process more information and empower the rapid consideration of trade-offs. It will also be used to create models which can aid decisions where there are gaps in data. Quantum computing could potentially do this faster and more accurately on a larger scale.

AI can also accelerate the integration of climate risks and decarbonization requirements into investment decisions, using hard-to-quantify data sources to model the lifetime performance of assets.

Further digitalization of data and the investment process will lead to greater harmonization of platforms and standards. As data becomes more widely available across and within markets, it will boost

transparency across the real estate industry. The ability of AI to manage space allocation efficiently could also drive the evolution and growth of the space-as-a-service model within real estate.

### **Assets: changing form and function**

AI will empower the development of intelligent buildings, combining AI insights with the Internet of Things to make assets more efficient and more comfortable for staff. For example, rather than simply reacting to changes in occupancy, AI will predict usage patterns and alter services accordingly for more efficient heating or cooling. Smart buildings will need to present a human face, rather than sterile “high tech” interactions, and use technology in a subtle and elegantly concealed fashion.

As AI accelerates the development of robotics, robot-accessible spaces will need to become standard, as seen in the logistics sector, where ultra-flat floors are a necessity for automated warehouses. We might start to see robot elevators and ceiling systems for robots in offices and other asset classes.

The development of augmented reality and virtual reality will lead to the creation of mixed reality spaces, where the digital and physical will be combined. This space will need to be flexible and adaptable.

Indeed, flexibility will become vital for future-proofing the life cycle of all buildings to allow for multiple uses within the same asset. This will become more important as the energy transition prioritizes reuse over new development. Flex will be the new mixed-use.

### **Design: new patterns for creation, construction and operation**

Architects will augment human creativity with AI to help visualize new schemes based on their back catalogue of designs, their design approaches and stylistic methods.

AI will also be integrated into building Digital Twins to make designing models faster and more accurate. These technologies together will improve operational effectiveness and enhance building sustainability by prioritizing reductions in energy and water consumption, so performance is optimized at the design stage by simulation. Portfolio data interactions will be through a more intuitive interface, such as a conversation.

Automation and robotics will reach the tipping point in the construction sector to meet labor shortages, enhance on-site safety and reduce costs through streamlined processes which speed up construction and reduce waste. Robotics will similarly enhance maintenance and facilities management.

When combined with a mindset which prioritizes sustainability, these advances will drastically reduce the environmental impact of buildings by improving and adjusting operational performance in real time and more effectively fulfilling the growing demand for the renovation and repurposing of existing assets.

But these changes depend on developing talent with a real estate-focused AI skillset. The real estate industry will be compelled to build its own AI workforce, through upskilling and attracting new tech talent.

A change in mindset to a “fast iteration” style of working will speed up the pace of innovation in real estate, making it more compatible with new styles of working and the pace of change in technology.

### **An action plan for real estate**

The future can seem intimidating, but the best way to be resilient to change is to be part of it. Scenarios-based analysis allows us to consider future change, challenge current paradigms and create an action plan for adaptability and resilience. The future will be created through the collective decisions we consciously make now. To prepare, real estate investors, developers and corporate occupiers must:

#### **Stay relevant, get involved**

- Proactively collaborate with governments, educational institutions and industry bodies to play a role in creating the new ecosystem of the built environment.
- Focus on training and upskilling real estate professionals and embrace tech talent in real estate organizations.
- Have a strategic view on industry shifts and consider the impact on relevant sectors and businesses in certain markets.
- Adopt a robust ethical use framework which guides the integration of AI and emerging technologies into real estate businesses.

#### **Be human**

- Craft human-centric spaces, where the digital and physical is integrated, seamless and subtle.
- Recognize the shifting demand for different types of space and the tech needs of different working generations (Gen Z, Millennials) in buildings.

#### **Build and operate intelligently**

- Start to digitize and build technology capabilities now in preparation for AI integration in the built environment, even if the complete picture is as yet unclear.
- Adopt a new “fast iteration” mindset, which means rapidly testing and refining ideas.
- Map out the new life cycle(s) of real estate. Embrace AI for modeling and simulations in the design, investment, development and use of buildings.

### **The time to prepare is now**

Computing and other technologies are not externalities on a distant horizon but are already integral to real estate and its future. There is a technology imperative to prepare for and real estate must be open to new business models, new ways of using physical space and supporting new industries. The time to prepare is now.

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## Research at JLL

JLL's research team delivers intelligence, analysis and insight through market-leading reports and services that illuminate today's commercial real estate dynamics and identify tomorrow's challenges and opportunities. Our more than 550 global research professionals track and analyze economic and property trends and forecast future conditions in over 60 countries, producing unrivalled local and global perspectives. Our research and expertise, fueled by real-time information and innovative thinking around the world, creates a competitive advantage for our clients and drives successful strategies and optimal real estate decisions.

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