KPMG

# KPMG China Leading PropTech 50 2024

未来行业50
Future Sector 50

不动产科技
PropTech

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## Overview

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In 1992, KPMG became the first international accounting network to be granted a joint venture licence in the Chinese Mainland. KPMG was also the first among the Big Four in the Chinese Mainland to convert from a joint venture to a special general partnership, as of 1 August 2012. Additionally, the Hong Kong firm can trace its origins to 1945. This early commitment to this market, together with an unwavering focus on quality, has been the foundation for accumulated industry experience, and is reflected in KPMG's appointment for multidisciplinary services (including audit, tax and advisory) by some of China's most prestigious companies.

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# Foreword

**Michael Jiang**

Head of Clients and Markets

KPMG China

China's economy is currently facing multiple challenges causing a slowdown in growth. As a pillar for the national economy, the real estate and building construction industry has been attracting significant attention. In 2023, the gross output value of China's real estate and building construction industry accounted for 12.6% of GDP, reflecting its vital role in promoting economic growth, stimulating investment, creating employment opportunities, and driving fiscal revenue. By the end of 2023, the urbanisation rate of China's permanent population reached 66.2%, compared with about 80% in developed countries. This means that the scale of the population waiting to be urbanised amounts to about 200 million people. In other words, the urbanisation process still has broad development space, which presents significant opportunities for the future development of the real estate and building construction industry.

## Navigating policies: focussing on people's livelihood and serving the overall development landscape

Under the "people-centred" national development concept, the real estate industry is not only market-based, but also closely linked to social stability and people's well-being. These characteristics make the stability of the real estate industry an important topic of national governance, as housing issues directly affect people's quality of life and the well-being of society as a whole. The policies that have been introduced in recent years reflect concerns about people's livelihood and the industry's social responsibilities, as they have been designed to stabilise societal expectations, accelerate market bottoming, promote industry stability, protect people's residential and property rights, and safeguard social harmony and long-term national stability.

## Technology empowerment: driving modernisation and high-quality development

In recent years, with the acceleration of innovation in cutting-edge technologies such as big data, cloud computing, artificial intelligence (AI), and blockchain, the world is entering an economic development period that is dominated by the information industry. Revolutionary breakthroughs in technology, innovative allocation of production factors, and deep industry transformation and upgrade are creating new quality productive forces, which are playing a vital role in building a new development model and modernising and transforming the real estate industry.

PropTech, which represents the deep integration of new quality productive forces in the real estate and building construction industry, is the key force driving digitalisation, networking, and intelligence across the industry. Digital technologies should be used to improve the operating efficiency, resource utilisation, and sustainability of the industry, which will help transform traditional real estate business from the extensive growth model to a model based on refined and intelligent management. Technological innovations are propelling optimisation and progress across the entire lifecycle of the industry. At the same time, forward-looking technological innovations are promoting the emergence of new industries, models and drivers related to real estate and building construction, thereby helping the industry to transition away from its traditional growth model and enter a new stage of high-quality development. Moreover, as the urbanisation process continues, the "citizenisation" of the floating population represents an important task and a key source of future market demand, which further highlights the necessity of industry innovation. In the years ahead, technological innovation will enhance the way that cities are run, improve urban living environments, meet people's aspirations for a better life, and drive coordinated economic and social progress.

As a pillar industry for people's livelihood, the real estate and building construction industry shoulders the responsibility and mission of promoting Chinese-style modernisation. Through continuous technological innovation and industry reform, this industry can achieve high-quality development, while also making positive contributions to the overall goal of Chinese modernisation and promoting long-term social stability and sustained economic growth.

In an effort to demonstrate its support for the transformation of the real estate and building construction industry, KPMG has organised this selection campaign, which aims to promote industrial cooperation and exchange, build a more open, innovative and sustainable industry ecosystem, help the industry deliver greater economic and social value in the new era, and make a positive contribution to Chinese modernisation.

Source 1 and 2 : National Bureau of Statistics

Source 3 : Department of Economic and Social Affairs of the United Nations

**Jacy Li**

Head of Real Estate and Building Construction

KPMG China

2024 marks the fourth year in which KPMG China has held the PropTech 50 selection. This year, the focus of the campaign has shifted to innovation. In the 2024 report, we examine the innovation, growth and foresight of application cases in the real world to explore the new quality productive forces that will propel the future development of PropTech and the real estate industry.

In the past several years, the real estate market has witnessed immense changes. Following the introduction of industry support policies in September 2024, there are indications that efforts to "stop the decline of the property market before restoring its stability" are making headway, but the industry is still facing considerable challenges. Recently, land transfers and housing sales have declined significantly compared to prior years, while we are seeing insufficient market confidence. In this context, responding to market liquidity risk and "ensuring the delivery of stalled housing projects" are important tasks for many developers and enterprises, while enterprises are focussing on raising funds and asset revitalisation to achieve stable operations. For real estate holding enterprises, large-value transaction activity started to pick up in the second half of 2024, and management capabilities in the "fundraising, investment, management and exit" cycle of real estate investment are particularly important at present. The evolution and iteration of real estate asset management capabilities have become crucial for market participants to weather the downtrend in the industry cycle. For building construction enterprises, business transformation capabilities need to cover both traditional and new businesses. From the refinement of traditional construction project management, to the positioning and sale of development products, to investment and planning of urban renewal projects, management skills have become a requirement for building construction enterprises that want to develop comprehensive capabilities.

Digital transformation is nothing new. In 2024, "data," "data resources" and "digital assets" have become buzzwords. The Interim Provisions on Accounting Treatment for Enterprise Data Resources, which came into effect on 1 January 2024, has inspired enthusiasm for the inclusion of data resources on the balance sheet, and generally raised awareness on the importance of data. However, in 2024, several listed companies have made subsequent corrections to their "data resources" disclosures in their interim reports, which is unusual. Clearly, there is some confusion around data issues that needs to be clarified, such as where data comes from, how data should be moved, where data should go, who should use data and how data should be used, and market participants need to gradually explore these issues in practice. While challenges exist, the rising importance of data also brings about transformation opportunities for technology enterprises and real estate enterprises. In the years ahead, I believe that various business and management processes in the real estate and building construction industry will be redefined by data, and enterprises will leverage the power of data to evaluate products and services in new ways and create more value.

Data will not only matter in the future—it also matters now amid the challenges and opportunities that are arising from the consolidation and revitalisation of the real estate industry. This transformation journey that the real estate industry is experiencing is being guided by data indicators and data architectures that harness models that have already been organised and refined. In the coming years, industry players should leverage data to strengthen their product and service capabilities and create more value for stakeholders. Amid the new normal, data and the data mindset will become the "new quality productive forces" of PropTech and the real estate industry, and enterprises will use these advantages to seize opportunities and forge ahead.

# KPMG China
# “Future 50” Ranking Series


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Future Sector 50


Business markets are just like arenas, and industries the race tracks on them. KPMG China’s "Future 50" ranking series, which covers industries such as finance, industrial manufacturing and automotive, biotechnology, retail, chips, healthcare, property technology, government, and energy, has been released to serve as a lighthouse to help enterprises make strategic development decisions based on where they are in their respective life cycles, and enables industries and investors to identify enterprises on the rise. We have also developed the "Future 50 Tracks" concept to continuously explore competitive opportunities for enterprises.

Since KPMG launched its "Future 50" ranking series, we have been striving to create and maintain a professional and fair platform to help extend various industry networks internally and externally for the purpose of expanding the overall value of industry ecosystems. In the selection process for these rankings, KPMG assembles a selection committee consisting of internal and external experts, which is tasked with assessing enterprises in an open, just, and fair manner from multiple perspectives, such as teams, technology, products, markets, and financing.

Going forward, we hope that KPMG's "Future 50" ranking series will generate more opportunities for enterprises, support industry innovation and reform, and provide insights on future industry trends.

# Overview

## Introduction to KPMG China's PropTech 50

KPMG China is pleased to release the 2024 PropTech 50 report, marking the series' fourth instalment since its launch in 2021. Amid ongoing changes in the market environment, KPMG is fully committed to promoting the high-quality, sustainable development of PropTech in China.

Technological innovation is driving the development of new quality productive forces, which are being used to cultivate new industries, models, and sources of growth. To transform research achievements into productive forces, technological innovations need to be quickly applied to specific industries and industrial chains, accelerating the process of turning scientific research from prototypes into products and ultimately into commodities. In this context, the selection of KPMG China's Leading PropTech 50 in 2024 focuses on emerging technologies that are being used in practice to develop new quality productive forces.

Digital and smart technologies are the key elements of new quality productive forces. Technologies and industries are mutually reinforcing, and they support each other and upgrade iteratively. Breakthroughs in original and disruptive technologies are accelerating the cultivation of the industries of the future. As a professional services provider that focuses on digital transformation, KPMG aims to analyse applications and practical cases in the industry, showcase leading enterprises and innovative technologies, promote knowledge sharing, cooperation, and exchange, and support the high-quality development of the industry.

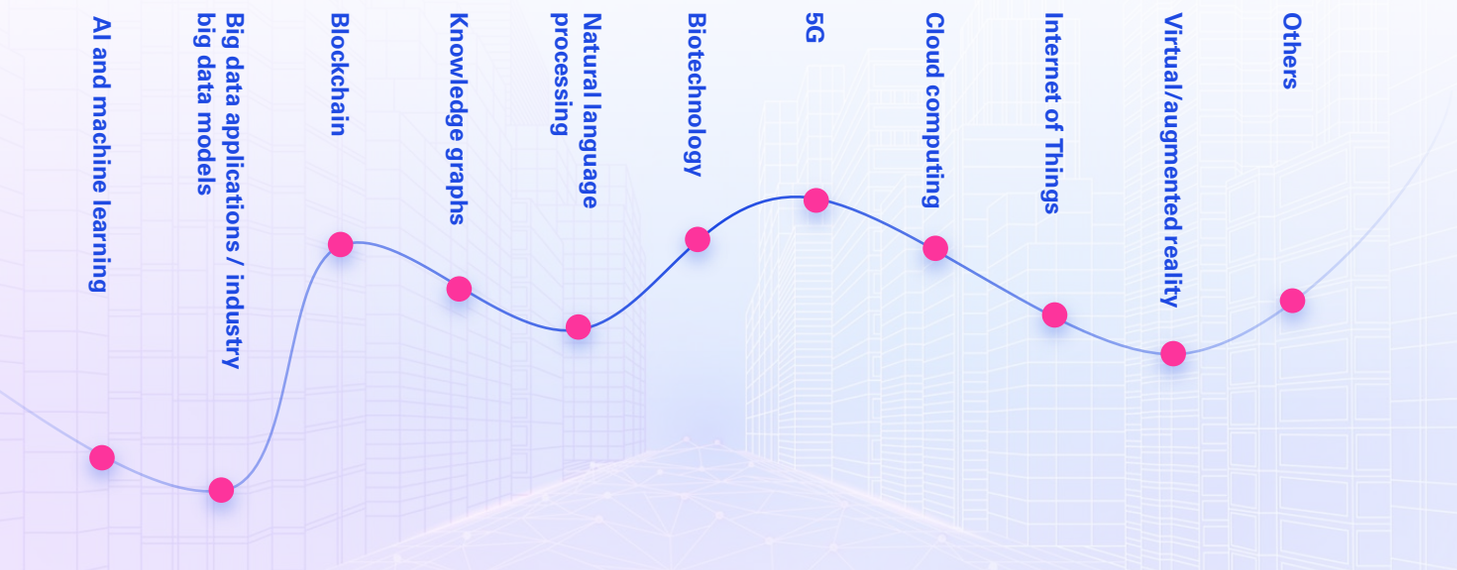
## Scope of participating enterprises

As at 31 August 2024, enterprises should have been operating for at least nine months to enter the evaluation process.

**Fields (phases/stages) for evaluation include the following (all relevant fields can be checked based on the circumstances of the evaluated cases):**

- Investment decision-making
- Planning and design
- Building methods and technology
- Construction (including decorations)
- Marketing and customer management
- Operations management and maintenance
- Investment portfolio management
- Financial and tax management
- Sustainable development
- Others

**Technical areas for evaluation include the following:**



## Selection process

**Case collection and preliminary selection**

**Documentation review and on-site visits**

**Comprehensive evaluation by the committee**

**Announcement of the results**

## Selection committee

The committee is composed of KPMG professionals.

## Core evaluation dimensions

### Potential

This refers to the ability to transform and empower the traditional real estate and building construction industry in a forward-looking manner and anticipate and respond to future market demands and technology trends, with a view to supporting high-quality development and cultivating the industry of the future.

### Innovation

Innovation refers to the development of unique and original technologies and business models, as well as the ability to mine new ideas, technologies and application scenarios, to significantly improve the effectiveness of existing processes, solve traditional problems, or create new business scenarios.

### Growth

Growth means being able to drive improvements in operations capabilities and the sustainable development of the real estate and building construction industry in ways that are highly reproducible and popular and that can be easily applied across the industry.

Our review focuses on the influence and value of the enterprises being evaluated. The comprehensive quantitative evaluation analyses whether the enterprises' offerings are being extensively and effectively applied in the industry, and whether the enterprises have played an important role in promoting industry development, as well as other dimensions such as team composition, technologies, products, market, and financing.

# Analysis of selected cases

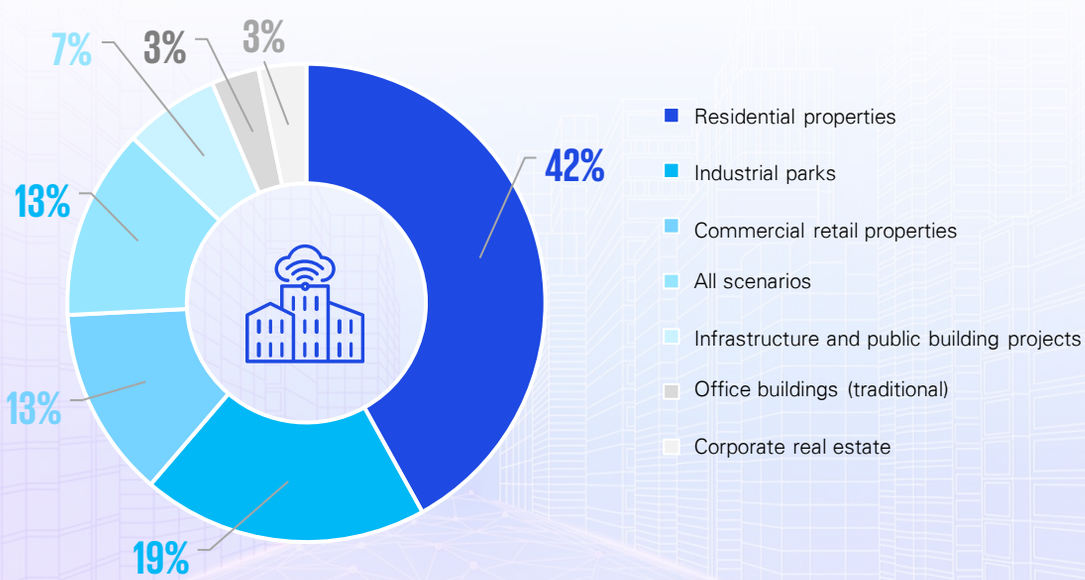
KPMG China has now held its PropTech 50 selection for four consecutive years, reflecting our steadfast commitment to helping the industry transform, upgrade, and achieve high-quality development. The 2024 selection emphasises practical cases, focussing on excellent real-world practices that creatively integrate technical solutions with industry scenarios. Overall, this report aims to accelerate the widespread implementation of high-quality practices in the industry, identify new breakthroughs for industry development, and empower new quality productive forces across multiple fields in the real estate industry.

In this section, we analyse the overall information of the selected cases from the three dimensions of practical application scenarios, business fields, and technology fields. In particular, we discuss trends around how technologies are being applied in the real estate industry and analyse the complexity of applications and market acceptance of emerging technologies in different business fields. In addition, we look at the enterprises whose cases were selected from the perspectives of years in operation, headcount, proportion of technical personnel, and financing round, so as to gain a better understanding of the development ecosystem for PropTech enterprises and provide a clearer picture of the future development path of the industry.

## Practical application scenarios

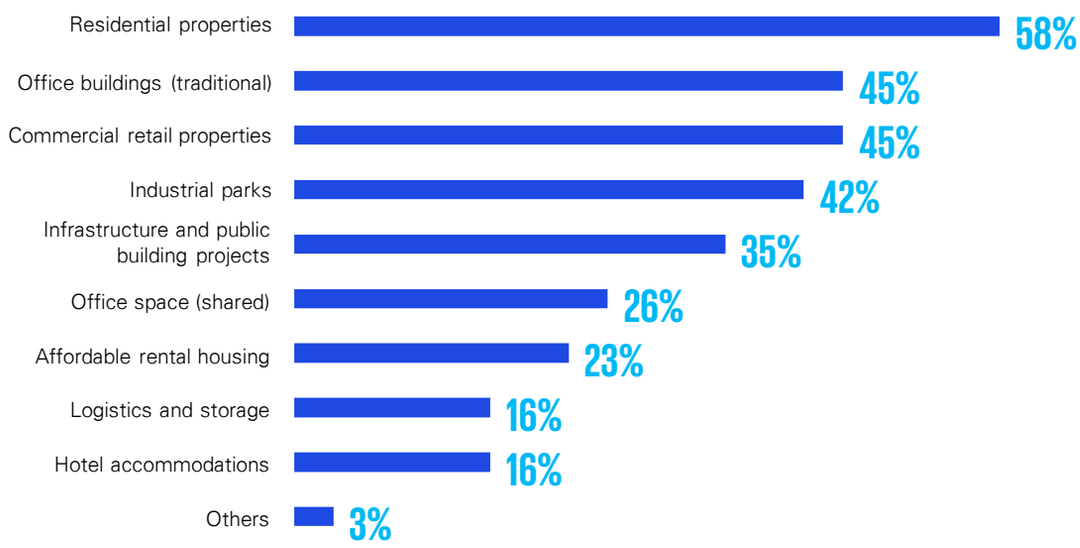
The practical application scenarios covered by this year's selected cases are distributed across various categories of the real estate industry, but they still have certain common characteristics. Residential properties and industrial parks are the two main scenario types, accounting for 61% of the total. In the past few years, the overall incremental development scale of residential properties has declined significantly, reflecting intensifying competition in the industry. In this context, market participants are trying to make progress and stand out in the areas of product positioning, cost control, and marketing. Increasingly, the application of PropTech solutions is evolving from extensive management to refined operations. In terms of scenarios, industrial parks rank second, behind residential properties. The operation and revitalisation of industrial parks' existing assets is a complex, long-term task. The selected cases this year explore investment promotion and leasing for industrial parks, green operations, renovations, and facility management, among other areas, demonstrating a trend towards full cycle operations. From a scenario perspective, commercial retail properties rank third. In this regard, investment decision-making and merchant management, among other issues, are still areas of concern for real estate operators. In addition, the 2024 selected cases also include application scenarios for corporate real estate, reflecting an increase in market demand for these tools and aligning with predictions made in previous KPMG Leading PropTech 50 reports.

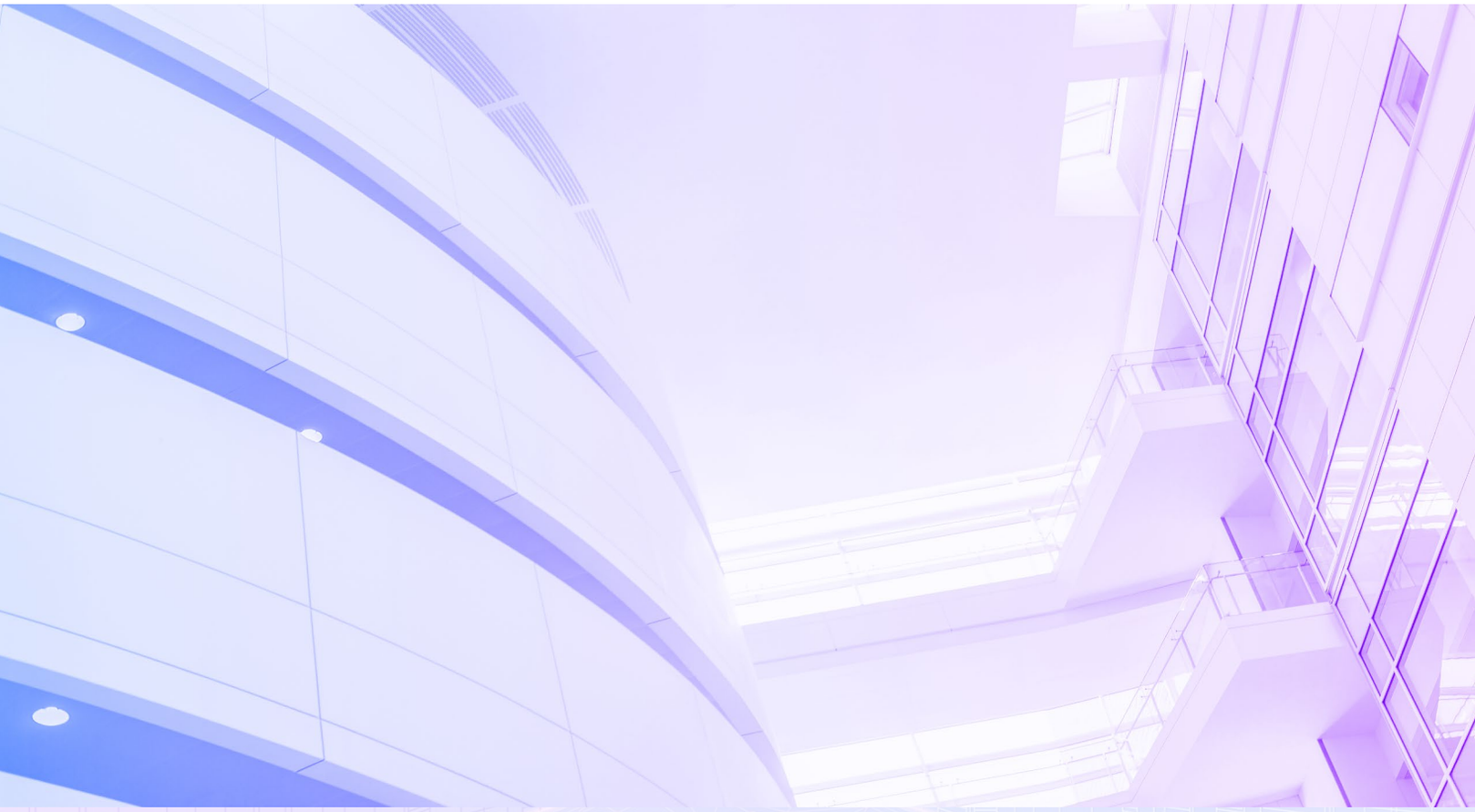
**Distribution of practical application scenarios of selected cases**



This report also features statistics on all application scenarios covered by the selected enterprises (apart from those represented in the selected cases). Among the selected enterprises, 58% provide solutions related to residential scenarios, ranking first; traditional office buildings and commercial retail properties tied for second place, while industrial parks ranked fourth. The latter three categories represent the main components of holding-type properties, which share a certain level of similarity in their digital technology foundations. However, operational capabilities are often reflected in the management of more specialised business scenarios. Notably, retail commercial properties and industrial parks are, in principle, eligible assets for C-REITs issuance, drawing continued market attention. PropTech companies are also steadily investing in these sectors.

**Analysis of practical application scenarios for case technologies (multiple choices)**



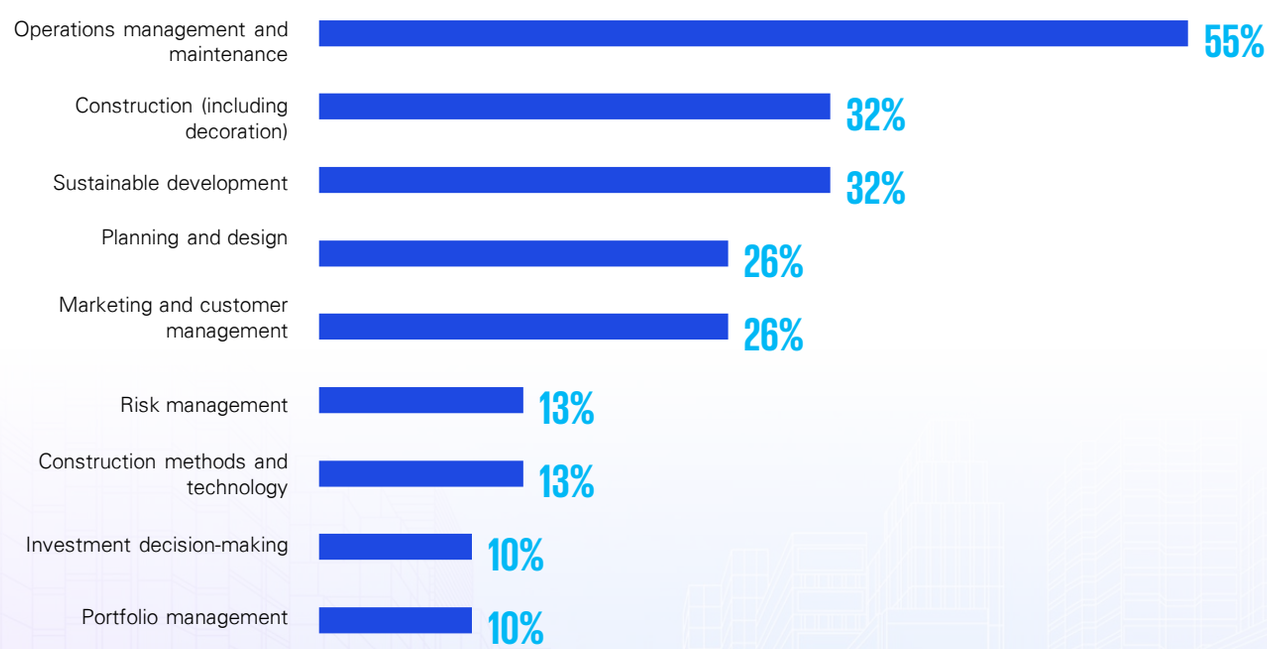



## Distribution by business field

In terms of business fields, "operations management and maintenance" leads the pack by a significant margin, accounting for 55% of selected cases. These solutions are mainly designed for holding-type properties. The importance of lean operations in the era of stock assets is now widely recognised; and going forward, PropTech will be a natural choice for enterprises looking to revitalise stock assets and enhance asset value. Construction and sustainable development are tied for second place. Real estate companies are focussing on more targeted cost and schedule management during the construction phase to better control overall project returns. Sustainability has become a "must-answer" question, with increasing attention from global and domestic investors on scientific carbon targets and decarbonisation pathways for real estate, especially in PropTech companies often need to integrate ESG capabilities more comprehensively into their existing service and product offerings. Planning and design, along with marketing and customer management, ranked fourth, reflecting the growing emphasis by real estate developers and operators on leveraging data-driven insights during the project design phase to guide early-stage activities. Meanwhile, leasing, tenant acquisition, and sales remain under pressure in the current market environment, requiring innovative technological solutions to reach and convert customers more effectively.

Enterprises operating in portfolio management and risk management need more professional teams and capabilities, so their moats are relatively wide. We believe that in the future, these two business fields will see considerable development alongside further improvements in asset revitalisation policies and the ongoing construction of the multi-level REIT market.

**Analysis of the primary business fields of selected cases (multiple choices)**



## Distribution by technical field

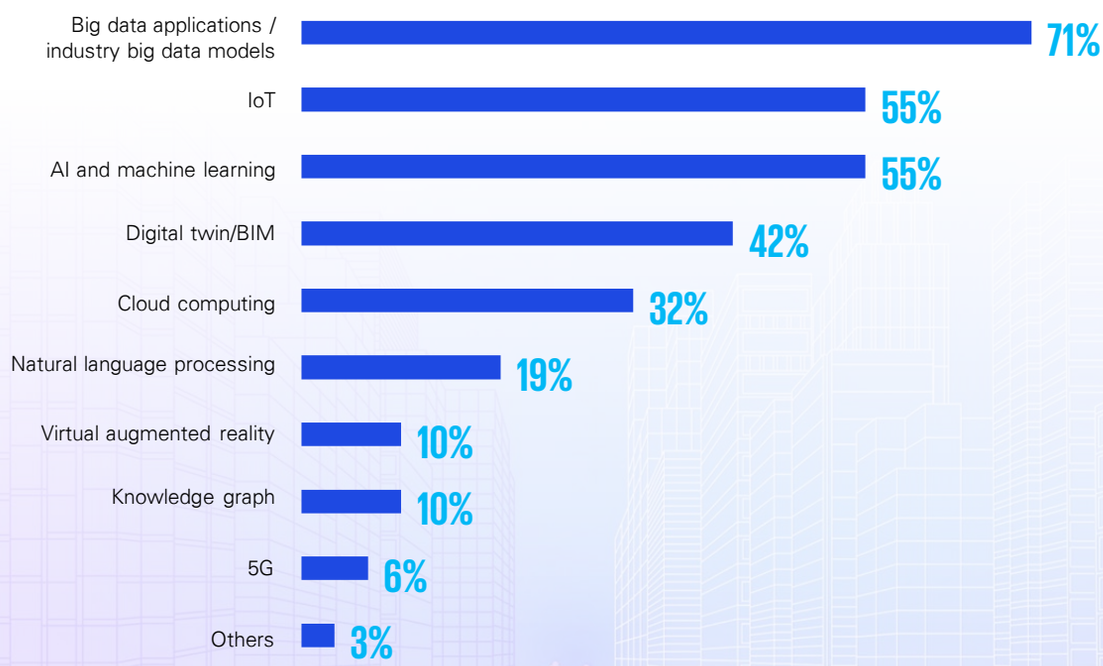
In terms of distribution by technical field among the cases selected this year, big data applications and industry big data models rank first, with 71% of total cases involving the application of related technologies. Meanwhile, Internet of Things (IoT), AI, and machine learning rank second, while digital twins/building information modelling (BIM) and cloud computing rank fourth and fifth, respectively. Although the development of the industry itself still faces considerable pressure, leading real estate and construction enterprises are steadily pursuing digital transformation and the "small steps but moving fast" co-creation model adopted by leading and PropTech enterprises is effectively driving the application of technology across the entire industry. Moreover, the Interim Provisions on the Accounting Treatment for Enterprise Data Resources, which took effect in 2024, have moved data assets into the spotlight. Legislation regarding the confirmation of data rights needs to be further strengthened and continuous market education is also needed to encourage enterprises to let go of the idea that "data is not an asset." Nevertheless, there is no doubt that awareness of the importance of data has improved significantly compared with previous years, providing significant development space for PropTech enterprises.

In the field of AI and machine learning, solutions mainly focus on enabling internal and external users of AI. Of course, the maturity of these technology applications across different selected cases varies. Some technology enterprises engage in mature AI agent training and iteration, while others have only recently completed proof of concept for their large language models (LLMs) and still need to promote their application in real-world scenarios. The abundance and timeliness of training data largely determines the development speed of AI agents, causing the popularity of effective data collection and data governance within the industry and real estate itself to determine the development speed of AI and machine learning.

The business field of operations management and maintenance has become the main developmental direction for PropTech, and this area is proving to be well-suited for the extensive use of IoT.

In contrast with natural language processing, knowledge graphs are no longer a mainstream area of independent technology development among PropTech enterprises. More technology enterprises are instead choosing to adopt mature third-party products, and this trend is reflected by the technical characteristics of this year's selected cases.

**Proportion of major technical fields of selected cases (multiple choices)**

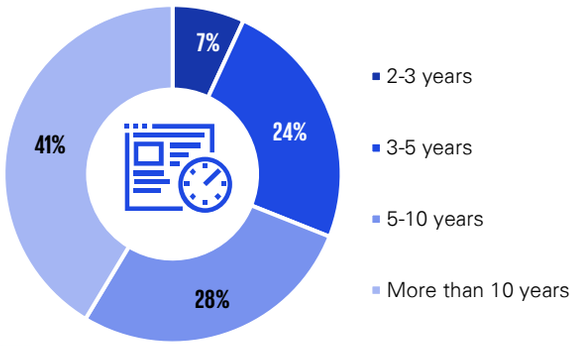


# Dimensional analysis of selected enterprises

## Distribution by years in operation

In terms of years in operation, nearly 70% of the selected enterprises were founded more than 5 years ago; 24% were founded 3-5 years ago; and only 7% were founded in the last 3 years.

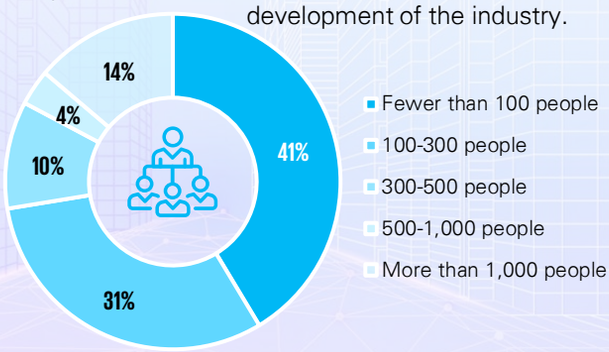
Amid the market downturn and financing difficulties, real estate development and operations enterprises (or their technology branches) that have financial strength and rich experience are showing a greater capacity for risk resistance, and as a result, have been driving the innovative application and development of PropTech. These enterprises have maintained a certain degree of R&D investment in recent years, engaging in pilot projects to pursue innovations, and are steadily implementing excellent applications. In contrast, PropTech start-ups are facing greater pressure to survive. In order to establish a co-creation relationship with leading developers, operators, or corporate real estate enterprises, start-ups not only need unique product and service offerings and robust technology capabilities, but also sufficient time to establish trust. Nevertheless, several selected enterprises have relatively short operating histories, such as a bailout project management platform for "ensuring the delivery of stalled housing projects," and an enterprise that offers third-party risk control platform products to real estate development groups. This trend is consistent with changes in the composition of market participants and projects in recent years. The emergence of new business scenarios as well as internal and external demands provide the basis for the development of PropTech. Exploration and innovation undertaken by enterprises are still important sources of industry vitality, bringing new possibilities for industry development in a complex environment.




## Distribution by company / team headcount

In terms of distribution by company / team headcount, among the selected enterprises, 41% have headcounts of less than 100; 31% have between 100-300; and only 14% have more than 1,000.

At the PropTech industry's current stage of development, the technology teams of small and medium-sized technology enterprises or real estate enterprises hold a leading position. Their flexible and efficient team structures enable them to respond to market changes more quickly and exercise agility in respect of technological innovation and business models. Many of the cases selected this year belong to project companies established specifically for innovation purposes that are affiliated with large enterprise groups, so their scale is relatively small. In contrast, while few large-scale enterprises were selected, those that were chosen still reflect the characteristics of other PropTech market participants. They include the technology subsidiaries of leading real estate developers that have been cultivating their PropTech capabilities for several years, large comprehensive real estate groups with long histories, and traditional engineering groups and architectural design institutes that have been gradually pursuing digital and intelligent transformation in recent years. On the whole, the synergies generated by enterprises of different sizes have boosted the diversified development of the industry.

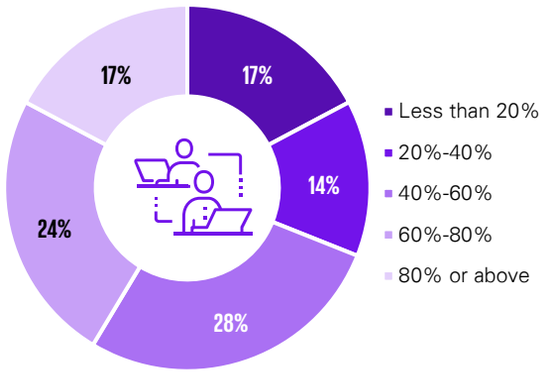


## Distribution by proportion of technical personnel

From the perspective of proportion of technical personnel, 41% of the selected enterprises count more than 60% of their workforce as technical personnel, while 28% count 40% to 60% of their workforce as technical personnel. In contrast, only 31% of them declared a ratio of technical personnel below 40%.

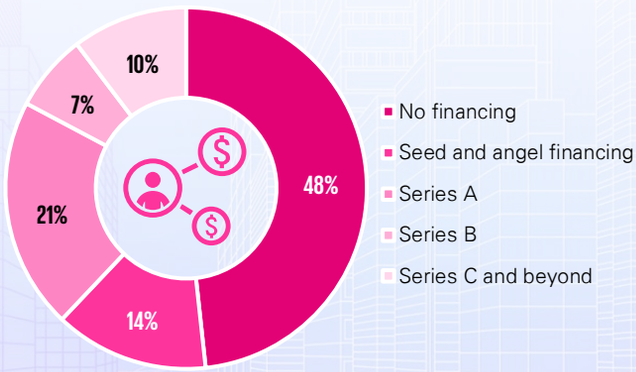
In general, the proportion of technical personnel in somewhat small PropTech enterprises with relatively preliminary products tends to be higher, highlighting the technology-driven foundation of the PropTech industry. Most enterprises choose to strengthen the composition of their technical teams to improve their R&D capabilities and safeguard their advantages amid industry competition. During this critical transformation stage that the real estate industry is facing, a high proportion of technical personnel has become a cornerstone for promoting innovation and the overall long-term development of technology enterprises.

Similar to the findings gathered from on-site visits and observations in previous years, dual technology and business professionals are mainly cultivated and acquired from within real estate development and operations enterprises through their internal training models. In this context, the co-creation model that features leading real estate development and operations enterprises alongside technology enterprises has become more popular, and benchmark projects that involve innovative practices can often be replicated quickly.




## Distribution by series of financing

From a financing perspective, approximately 50% of enterprises have not engaged in any financing; 14% are in the seed or angel financing stage; and 10% have started their series C or subsequent financing rounds. Apart from selected enterprises that are part of large enterprise groups that do not need financing, PropTech enterprises are facing a relatively rough time securing financing due to the overall impact of this year's downturn in the real estate industry, so pressure around managing their own operating cash flows is significantly higher than in previous years. In 2024, a number of PropTech enterprises have optimised and streamlined their headcounts to a certain extent to address the challenges brought by the industry downturn.



# Key PropTech Trends in China

# 1 Urbanisation in China is moving into its second phase, bringing about significant changes for the real estate industry and shifting the focus of competition to product technological advantages

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The second half of China's urbanization will focus more on people and the quality of urbanisation. To satisfy people's pursuit of a better quality of life, digital technology is penetrating into all aspects of real estate at an unprecedented pace, and the technological advantages of real estate products will quickly spread from high-end projects to mass projects and rigid demand projects.

Of course, technology is not a solution to all problems. In this competition around product technology, we also need to deliberate on certain issues, such as how to balance the development of technology products with human-centred, caring services, and how to protect data privacy while pursuing operating efficiency.

**Ryan Li**

Partner, Transformation Advisory
KPMG China

The real estate industry as a whole is facing a critical point in the transition of the industry cycle; and as a result, efforts to reduce costs, raise efficiency, improve quality, and control risks are more important than ever. Thanks to the benefits of technology, enterprises can pursue innovation in management, products and services in order to improve their internal efficiency, develop high-performance products, and offer a premium customer experience. At the same time, technologies are also causing real estate companies to shift towards intelligent and green operations. CNOOC Enterprise Development harnesses technological innovation to empower excellent living spaces, strives to build first-rate houses that are "green, low-carbon, smart and safe," and promotes the development of a new model for real estate development, so as to better meet people's needs for high-quality housing. In a word, technology is enabling the development of new quality productive forces in the industry, and innovation is driving the industry's high-quality development.

**Wang Chong**

General Manager
Shenzhen Haizhichuang Technology Co., Ltd. ("Shenzhen Haizhichuang Technology")

Over the past two decades, China's urbanisation has made huge strides, reflecting the country's transformation from a traditional industrial society to an information society, and then finally to an innovative digital society. According to data from the National Bureau of Statistics, China's urbanisation rate climbed from about 36% to 66.16% from 2000 to 2023, with the urban population growing from 456 million to 930 million. Remarkable achievements have been made, but certain problems have also emerged: a widening gap between urban and rural areas, uneven development within cities, environmental pollution, serious traffic congestion, and complex community management, among other issues. Recently, the growth rate of urbanisation has gradually slowed down. The Five-Year Action Plan for Deeply Implementing the People-oriented New Urbanisation Strategy recently issued by the State Council pointed out that after five years of efforts, the urbanisation rate of the permanent population could reach nearly 70%. Although this rise from 66.16% to 70% represents less than 4 percentage points, what is more important is that the "second half" of the urbanisation process will focus more attention on people and the quality of urbanisation.

With the steady promotion of the new-type urbanisation policy, China's real estate industry is ushering in new development opportunities and challenges. The focus of the real estate industry is gradually shifting from large-scale, rapid development to sophisticated management of existing properties and complex urban renewal projects. Meanwhile, green buildings and smart communities are gaining in popularity in real estate development. Furthermore, people are steadily pursuing a better quality of life, while technology is penetrating into all aspects of real estate at an unprecedented pace, bringing new solutions that will allow the industry to address various challenges.

Recently, competition in the industry has focused on the technological advantages of products. More and more real estate enterprises have started transforming from "users" to "creators," as they actively invest in R&D and innovation in relation to technological products, aiming to master core product technology and developing advantages amid fierce market competition. Big data, cloud computing, IoT, AI and other cutting-edge technologies are steadily expanding across various aspects of the real estate industry. From planning, design and construction to operations, management and services, the power of technology is reshaping the entire industry ecosystem. For example, in respect of smart communities, we have witnessed that in some high-end projects, real estate enterprises are actively exploring technology applications, including by combining large language models (LLMs) with digital human technology to offer smart customer services such as human stewards; using facial recognition and trajectory tracking to implement early warning and monitoring for safety accidents, such as elderly individuals falling down, and children slipping and falling into water; and adopting smart delivery robots to complete express deliveries. In these ways and more, enterprises are offering an array of new amenities, including a full suite of indoor smart home capabilities, smart security services in communities, and smart property management and community services.

We believe that the technological advantages of new real estate products will quickly spread from high-end projects to mass and rigid demand projects. In fact, in developed countries in Europe, North America, and Asia, due to strict regulations on the collection of personal information, real estate enterprises tend to focus on popular services for their technological investments without much of a focus on technological customisation for high-end projects. In Singapore, more than 80% of residents live in shared housing units in public housing communities. A long time ago, the Singaporean government put forward the "future community" concept, with the goal of using smart technology for the operation and management of public communities, including monitoring of the public environment, management of water and electricity consumption in public places, and community garbage disposal. These measures make the living environment more convenient, comfortable and efficient for urban managers and residents, and light the path towards a smarter, greener and safer future urban ecosystem.

As the main driver for economic and social development in China, urbanisation is quietly entering a new stage. From creating urban skylines dotted with high-rise buildings to shaping the initial outline of smart cities, technological innovation has brought infinite possibilities to the real estate industry. In this context, companies should be aware that technology is not a panacea and still need to deliberate on certain issues, such as how to balance the development of technology products with human-led, caring services, and how to protect personal information and private data while pursuing operating efficiency.

# 2 Amid economic transformation, real estate marketing and investment promotion are becoming smarter

The real estate industry is facing pressing demands around digital transformation. As customer experience will become a key concern in the future, enterprises must accelerate the adoption of digital technology to improve customer experience and market responsiveness. At the same time, the application of big data and AI will help enterprises understand market dynamics and develop more accurate marketing strategies. Moreover, individuals and small businesses are playing an increasingly important role in the market due to the rise of social media. Enterprises should consider using emerging channels such as short videos to expand their brand influence. Looking ahead, smart management of the real estate industry will inevitably take hold, and enterprises will need to actively embrace technological innovation and meet market demand in a smarter way in order to promote the development of the industry as a whole.

**George Wong**

Head of Real Estate and Building Construction , Southern Region
KPMG China

In terms of real estate marketing and services, the application of AI technology will usher the industry into a future that is characterised by more efficient, personalised and real-time capabilities. The introduction of AI multi-agent collaboration technology enables AI to perform deep analysis of massive amounts of market content and data, and gain insights into relevant market trends and consumer preferences. With this approach, enterprises can not only develop more accurate marketing strategies, but also generate customised marketing information and massive amounts of personalised content for customers, so as to improve customer participation.

Through the application of AI on various content and customer-facing platforms, enterprises can deliver real-time responses and personalised guidance to consumers. Real-time responses make marketing activities more flexible and efficient, helping enterprises stand out among the competition.

In addition, AI technology enables a more situational and refined customer service experience. Through the continuous analysis and learning ability of AI agents, enterprises can provide more targeted customer service and support to meet the specific needs of customers in different scenarios. This consumer-centred service model not only improves customer experience, but also enhances customer loyalty.

**Han Jian**

Founder and CEO, Shanghai Circles Technology Co., Ltd.

The prosperity of the real estate industry acts as an important barometer of economic behaviour and reflects the level of activity in the economy to a certain extent. In the context of economic transformation, the real estate industry is facing unprecedented challenges. Traditional real estate sales and holding enterprises, whose marketing and investment promotion models are mainly based on media launches and intermediaries, are experiencing difficulties in their efforts to accurately reach target customer groups and meet the diversified needs of the current market. Meanwhile, existing shortcomings such as long cycles, high costs, and low efficiency are posing significant bottlenecks for the growth of real estate business. At present, amid growing pressure on business performance, together with tightening budgets for sales expenses, enterprises urgently need to improve the accuracy and transformation efficiency of marketing and investment promotion, and the key to solving these obstacles is to leverage digital technology.

In the field of marketing, with online housing sales booming during the pandemic, marketing in the real estate industry has accelerated to the "comprehensive online" stage. After years of being refined, the "internet + real estate" model has matured, and more and more real estate development enterprises have been building self-owned online marketing platforms, with functions including house viewing, trading, commission settlement, event promotion, and check-in services. A number of these emerging products offer experiences that are on a par with those of leading third-party platforms such as Beike and Anjuke. Furthermore, in the era of equal information rights in digital media, the major marketing agencies are diversified and boast nationwide coverage. In addition to enterprises and institutions, individuals can also play an important marketing role through social media and other platforms. To acquire customers, enterprise employees and key opinion leaders (KOLs) in the industry need to attract a large number of fans in a short period of time through short videos, live broadcasts, "grass planting" (introducing and boasting about the quality and characteristics of certain products to encourage customers to make purchases) and other content marketing methods, all of which have become important new forces in enterprise marketing. In order to convert customers, enterprises are applying cutting-edge technologies such as virtual reality (VR) and augmented reality (AR), with the goal of providing consumers with an immersive purchasing experience, strengthening their recognition of the enterprises' product power, and enhancing their willingness to purchase houses and their satisfaction with their purchases. In this way, marketing is evolving from a "product-oriented" model to an "experience-oriented" one. In respect of customer operations and management, it is necessary to integrate big data and AI technology, deeply mine consumer behavioural data, build accurate user profiles, and devise and implement personalised marketing strategies. These efforts align with trends seen across all industries, which are embracing the next round of technological transformation, and they also reflect the real estate industry's transition towards refined management.

In the field of investment promotion, the application of real estate technology is focussing more on improving the efficiency of investment promotion and optimising investment promotion strategies. The combination of smart investment promotion platforms and big data analysis tools enables enterprises to grasp market dynamics in real time. Through customer portraits and business cycle analysis, enterprises can understand market dynamics in real time, accurately locate target customer groups, develop investment promotion strategies and business plans that meet market needs, and maximise the effectiveness of their investment promotion. Through customer segmentation and "personalised" management, enterprises can deeply tap customer value, build long-term stable customer relationships, and improve the success rate of investment promotion and customer satisfaction programmes. In addition, smart contract applications that are based on digital trust are providing transparent, safe and efficient solutions for contract signing, capital flow and other parts of the investment promotion process. These initiatives not only reduce the risk and cost of investment promotion, but also improve the efficiency and transparency of the investment promotion process, laying a solid foundation for the stable development of enterprises.

Looking ahead, thanks to the support of technology, the real estate industry will make the leap from the "traditional marketing and investment promotion" model to the "smart marketing and investment promotion" model. Enterprises need to proactively embrace technological changes and build a marketing and investment promotion system that is centred around data and driven by smart agents. Meanwhile, companies should fully leverage the advantages of digital media to expand diversified marketing and investment promotion entities, and continuously pursue technological innovation and application in order to improve the accuracy and efficiency of their marketing and investment promotion. By following this path, the industry can meet the needs of multiple markets in a smarter way and reach a higher level of development.

# 3 Balancing risk management by choosing what to manage and what not to manage

In the past two years, the real estate industry has undergone multiple rounds of adjustments and there are still many uncertainties in the external environment, which set the bar high for enterprises' resilience and risk management and control capabilities. From the perspective of project development, site management, investment promotion/sales, operations management, and cost management, enterprises always face various risk factors and scenarios. With the continuous development of risk control architectures and technologies, combined with steady improvements in the ability to organise and identify industry risk control scenarios, many enterprises have been implementing technical management and control methods to judge the overall risk landscape, allocate risk control resources more scientifically, and conduct early risk warnings and disposals in a more timely manner, with a view to pursuing high-quality development.

**Ivy Ye**

Partner, Risk Consulting
KPMG China

With the advent of the era of AI and digital intelligence and amid adjustments in the external competitive environment, the real estate industry is facing profound changes. The previous one-time model for real estate development and sales is moving towards a model of full cycle value operations that incorporates investment, financing, construction, management and exit. Looked at from another point of view, the previous development approach, which was driven by market and capital leverage, is moving towards a new approach that is driven by technology and management leverage. In this context, strategy and risk management have become key capabilities for enterprises to stabilise their business. In the years ahead, the success of companies' digital intelligence transformation will become the key element of their core competitiveness; and the application of AI capabilities will serve as an important driver of their digital intelligence transformation, which will not only upgrade efficiency, but also capabilities and mindsets.

**Xu Bin**

Chairman, Shenzhen Chuangxiang Shuzhi Technology Co., Ltd.

In recent years, the real estate industry has undergone various adjustments, and the macroeconomic recovery is still uneven. Amid uncertainties in the external environment, real estate enterprises' internal resilience and risk control and prevention capabilities are more important than ever.

Each aspect of daily operations faces risk factors and risk scenarios, such as regulatory policies, cost control, capital shortages, and leakage risks in various processes. Unfortunately, many enterprises are experiencing similar issues in respect of risk control construction, including how and what to manage, and how to break away from the situation of "management efforts end after tightening, loosen after ending, and become disorganised after loosening." Based on our observation and implementation experience, we believe that these challenges arise due to the following:

### Challenge 1. Management issues render the risk control governance structure ineffective

The "three lines of defence" are a classic governance structure for risk control management. The three lines form an effective risk prevention system that features mutual cooperation and mutual restrictions among the business side, management side and supervision side. However, management problems are quite common in the real world. For instance, an issue might remain unidentified even after it has been reviewed by multiple departments, and the department that should be able to identify the issue has no opportunity to participate in the review process, or fails to effectively participate in the review process, ultimately damaging the company's interests. An issue might also be left unaddressed if enough people in charge of addressing it disregard the issue on the basis that enough people did so in the past.

Therefore, aligning rights, responsibilities, and interests provides the foundation for the establishment of an effective risk control framework. Enterprises should constantly review whether the allocation of rights, responsibilities and interests is suitable for their current functional orientation, authorisation approval process and risk management; reorganise the allocation when necessary; and give relevant personnel the right authorities and risk control responsibilities to avoid buck-passing and management gaps. Meanwhile, a supervision and accountability mechanism should be developed to ensure the effective implementation of management responsibilities.

Since the integrated management and control concept of "strengthening internal control, preventing risks and promoting compliance" was put forward in the Notice on the Promulgation of the Implementation Opinions on Strengthening the Development and Supervision of the Internal Control System of Centrally Administered Enterprises (Notice No. 101 of the State-owned Assets Supervision and Administration Commission), it has in practice gradually developed from a "three-in-one" model to a "multiple-areas-in-one" model that incorporates risk control, internal control, compliance, legal affairs, audit, supervision, disciplinary inspection, and other areas, thereby strengthening the comprehensive prevention capabilities of the second and third lines of defence. Integrated risk control management has gradually become the standard choice of large and medium-sized enterprises. Amid the emergence of risk control platforms, efforts to integrate risk control have been strengthened by the opening of the underlying logic of platforms and data sharing, which is the main reason that many enterprises choose to deploy risk control platforms.

### Challenge 2. Risk control resource inputs are disconnected from key risks, resulting in low risk control efficiency and failure to realise the full value of risk control

As the saying goes, "Hit the snake's seven inches" (i.e. focus on the most critical part). As risks are everywhere, risk management also needs to focus on the main issues. In practice, the measurement of risk impacts and the value of control has always been a management pain point. The traditional method entails performing sampling to find individual outliers, so as to infer the overall impact, or to estimate the risk exposure by analysing historical data, which is highly dependent on the experience and skills of risk control personnel. Sampling risks are also likely to lead to the omission of significant risks.

With the continuous development and application of information technology, emerging risk control tools and platforms have begun to assist many enterprises in more accurately capturing risks, intervening in risk control earlier, and more efficiently tapping the value of risk control. In particular, these risk control tools and platforms are being used to create value in the following ways:

- Efficient use of data resources

Real estate enterprises generate significant amounts of data in their daily operations. However, most of this data is deposited in different systems that are not interconnected. As time goes by, data islands form, and enterprises fail to effectively use this data to support their business and risk control. By establishing a risk control platform, companies can obtain, summarise and sort various types of risk control-related data from different systems, which can facilitate risk identification and monitoring of risk changes.

For instance, in terms of project management, by establishing internal and external materials databases, enterprises can capture data related to bidding and tendering, analysis of project licence changes, project settlement and other areas, and risk scenarios for cost outliers. In terms of procurement management, high-risk issues can be identified through horizontal analysis of multiple quotations, market price benchmarking, and supplier/purchaser association analysis, among other methods. In terms of tenant management, by engaging in qualification management, horizontal analysis of rent, contract analysis and other processes, enterprises can identify various risk scenarios, such as pricing anomalies in rent, advertising, and multiple business points, as well as irregular occupancy. The risk control team can further track and analyse these high-risk scenarios to more accurately locate risks.

From an audit perspective, teams can make significant improvements to audit efficiency, for example by transitioning from manual sampling to full analysis and mining; and they can also achieve a more comprehensive risk assessment of companies.

– Accumulation and reuse of risk control experience

Risk control experience is of vital importance to enterprises. Amid the continuous recovery of the real estate industry, the risk control-related human resources of real estate enterprises are generally not sufficient, and the projects and fields that need to be supervised tend to be numerous and scattered. In this context, effective accumulation of experience helps to continuously improve the efficiency of risk control and make up for the shortage of human resources.

At present, a variety of model-based technologies can be harnessed to solidify risk control experience in systems. For high-risk issues, pre-intervention of risks can be achieved by connecting the risk control system with business systems and enabling them to interact, and by establishing embedded interception functions and non-embedded risk prompts.

Regular risk analysis and follow-up can also be carried out by analysing the risk characteristics of various events. Generally, leading risk control platforms and tools have established thousands of practical risk control models, so risk control personnel do not need to engage in repeated training or identification efforts. The time saved can be used to capture new risks and update risks, better enabling companies to steadily maintain control over risks. For example, in recent years, leading engineering construction enterprises have actively engaged in data governance and process optimisation to respond to the risks of cost overruns and construction delays. These efforts have been undertaken on a project cost management background that is characterised by "large quantities, miscellaneous items and a long cycle" and increases in the synergy requirements of project site management and other process management objectives in areas such as business, financial accounting, tax management, management of accounts receivable, and inventories.

As risk control capabilities continuously improve, risk scenarios are steadily deepening, leading to the emergence of new risk models and corresponding risk management and control methods, which pose new requirements for the extensibility of the risk control platforms themselves. We have also observed that, at present, unified technical bases have been realised for certain risk control products, which allows for new risk control modules to be added through a "plug and play architecture (插拔式)." Using these products, enterprises can continue to develop new risk scenarios and models in the future.

– Refinement of risk scenarios

Historically, many risk scenarios could not be effectively identified and measured due to a lack of resources and sufficient processes, resulting in certain significant risks being ignored. Thanks to the continuous emergence of new technologies, it is now possible to identify these risks. For example, enterprises can leverage AI technology to identify risks and trigger early warnings in respect of violations of operating rules, parts/components exchange in the process of receiving goods and contract reviews, among other areas.

For example, in tenant management scenarios, it has historically been difficult to obtain accurate and effective tenant operations data without significantly complicating the tenant management process itself. However, management instruments such as the financial mini application Xiaopiaohe (小票盒) have recently emerged to address such issues. These tools can obtain real-time operations data by acquiring POS data and provide effective support for risk control and supervision. These risk control solutions are also steadily delivering more benefits as they incorporate various new technologies.

Within the industry, discussions are constantly being held regarding best practices in risk control management. The emergence of integrated risk control management models has contributed to the development of a risk control model that is well-suited for Chinese enterprises. With the help of steadily improving risk control technology, management personnel are using full risk analysis, advance risk warnings, and detailed risk scenario identification capabilities to understand their enterprise's overall risk situation at all times and invest risk control resources purposefully. Business teams can perceive their enterprise's risk status in real time and intervene in a timely manner; and risk control teams can improve supervision efficiency, and shape risk control models to constantly empower business teams. In summary, in an uncertain environment, digital intelligent risk control tools are helping real estate enterprises make steady progress.

# 4 AI LLMs are accelerating the transformation and upgrading of smart construction, while digital innovation in the building construction industry is ushering in greater possibilities for efficient, high-quality development

As a traditional industry that started relatively late in terms of standardisation and digital development, when embracing AI LLMs, the construction engineering sector needs to deliberately align practical application scenarios with real industrial value, bringing to mind the old saying, "Don't look for nails while holding the hammer."

At the same time, considering the accessibility and cost-effectiveness of the three drivers/pillars of AI—algorithms, computing power, and computational data—we recommend that building construction enterprises that are pursuing transformation address them through different approaches. In terms of computing power, which requires huge investments in underlying hardware, enterprises may actively seek supply from the industry ecosystem, so as to take advantage of established capacities. In terms of algorithms, the key lies in the introduction of underlying models and the customisation and training ability of industry/enterprise models. In addition, companies should fully consider the integrated application of large and small language models (SLMs) . Similar to the benefits from integrating knowledge domains and models, enterprises can make full use of the multimodal semantic understanding and interaction offered by LLMs and the precision and controllability of traditional AI SLMs. Finally, in terms of computational data, data represents the foundation of an enterprise's independent capability development. Today, with the continuous progress of technologies such as federated modelling and privacy computing, the compliant sharing of data within enterprises and even upstream and downstream segments of the industrial chain should no longer be a mere vision, but should be implemented as soon as possible. Based on their self-owned rich data "corpus," enterprises can train and finetune AI agents that will drive business and management value, and upgrade AI applications from simple dialogue robots to copilots that can be gradually integrated into business systems that are familiar to front-line business personnel. These efforts are critical for enabling front-line business personnel to gain a better understanding of the power of AI, and engage in promoting the smart transformation of business.

**Silvester Liu**

Partner-in-Charge of CIO Advisory, KPMG China
Head of Digital Solutions, KPMG Lighthouse

Digital transformation is reshaping the future of the building construction industry. In the past decade, building technology has demonstrated great innovation potential, developing from traditional BIM towards integrated smart construction technologies such as digital twins and AI. But the true lasting effect of these innovations lies not in the technologies themselves, but in how they can be transformed into actual improvements in productivity.

In the current practice of building technology, we see that AI and building expertise are being deeply integrated to develop efficient project management paradigms. From design collaboration to construction management, and from quality control to safety supervision, digital tools are offering robust support for full-process project management, improving the reliability of digital transformation in the building construction industry.

Going forward, building technology will continue to break traditional boundaries, paving the way for a bright future for the construction of smart cities. Using technologies such as digital twins and AI LLMs, enterprises in the building construction industry can identify practical problems in advance and solve them in virtual spaces. This new approach will bring new incremental markets to the building construction industry, enable China's smart building construction enterprises that are going global to upgrade their technical capabilities, and generally facilitate the strategic transformation of the entire industry towards a smarter and more sustainable future.

**Li Gang**

CEO, isBIM Limited

Following the rapid global development of smart construction, China has maintained a leading position in promoting the digital transformation of the building construction industry. New quality productive forces have gradually been optimised and upgraded both inside and outside the industry, including through the establishment of the overall "AI+" framework in accordance with the *Development Planning for a New Generation of Artificial Intelligence*, and the emphasis on the importance of smart construction and the industrialisation of the building sector in the *14th Five-Year Plan for the Development of Smart Manufacturing*. In Hong Kong SAR, the government and the industry have attached great importance to smart construction, and strong policy support and capital investments have been provided to promote application research in frontier sectors. In terms of independent research and development, the government has set up a research institution—the Hong Kong Generative AI Research and Development Center (HKGAI)—and strengthened industrial cooperation with well-known enterprises at home and abroad to jointly promote the construction of smart computing centres. The promotional efforts of various local governments and the response from the industry have engendered deep innovative integration across the building construction industry, ushering in unprecedented opportunities. As a result, the building construction industry of the future will not only entail the construction of physical structures, but will also rely more on data, smart decision-making and systematic management, revealing how the transformation of smart construction will progress in the areas of digitalisation and intelligence.

The advantages of AI LLMs lie not only in their powerful data processing and decision support capabilities, but also in their deep applicability across multiple professional fields, as well as their powerful data analysis capabilities. By integrating information from BIM (building information modelling), IoT sensors and historical construction data, AI LLMs can support building construction projects in conducting more accurate prediction, planning and management. The wide application of BIM has allowed for data to be integrated across the entire lifecycle of buildings, and AI LLMs have further improved BIM intelligence. In particular, deep learning algorithms have been adopted to analyse, optimise and dynamically adjust building information. AI LLMs can generate and adjust construction schemes according to real-time data, thereby improving construction efficiency and reducing costs.

In addition, the development of AI agents provides new technical support for the building construction industry. AI agents combine IoT, edge computing, big data analysis and other innovations to enable various types of equipment on construction sites to automatically perceive the environment, work together, and provide real-time feedback and adjustments through cloud computing IoT devices collect data in real time through sensors; and AI agents can automatically identify safety hazards and delays on the construction site, and automatically generate response plans. These automated management and decision-making processes have significantly improved the intelligence of the building construction industry, while also supporting the future development of the industry.

AI LLMs have been applied in many scenarios in the building construction industry, promoting deep reforms in industrial productivity and management models. In the formulation of construction schemes, AI LLMs can integrate multiple data sources to quickly generate accurate construction plans. Traditional construction schemes require a significant number of manual calculations and repeated corrections, and AI LLMs can optimise the construction process by automatically analysing terrain, climate and performance of materials, among other factors. For instance, production activity data can be automatically collected, summarised and transmitted to an engineering big data platform; using "AI + algorithm" recognition and analysis and edge computing capabilities, video information streams for matters such as construction status and the behaviour of on-site personnel can be decoded frame by frame; real-time analysis and identification can be carried out using the edge computing box; and on-site information can be quickly sent to back-office and management personnel for monitoring purposes, greatly improving the accuracy and efficiency of project implementation.

In terms of project management, AI LLMs and BIM are being combined to manage construction progress and quality across the entire lifecycle. By leveraging IoT sensors and panoramic cameras, the construction process can be recorded with a panoramic view, and managers can view the project progress anytime, anywhere. AI systems can also make predictions and provide alerts regarding construction data through deep learning technology, help managers identify potential risks in advance, and carry out automatic task allocation and real-time monitoring. On smart construction sites, unmanned patrol inspection systems can carry out automatic patrols to ensure the safety and quality management of the construction site. In addition, AI technology can help optimise the use of materials, engineering personnel arrangements, cost control and other areas by analysing the historical data of construction sites, significantly improving the overall efficiency and accuracy of projects. Some leading construction technology enterprises have launched digital and smart SaaS solutions in the field of project management. Based on AI LLMs, enterprises have developed technologies that incorporate project supervision, smart construction site capabilities, unified data platforms and other areas. By integrating data from all segments, these systems can provide comprehensive project insights, automatically identify bottlenecks, predict potential delays and put forward optimisation suggestions. These solutions have passed the validation phase; and in the future, more pilot projects should be conducted to expand the adaptability of these tools across different project scales and types.

AI LLMs have demonstrated extraordinary capabilities in energy conservation and emissions reduction in the process of smart construction, providing strong support for the realisation of green and low-carbon smart construction. In the construction phase, powerful AI-enabled data analysis capabilities have brought revolutionary changes to the selection and recycling of building materials. On the one hand, AI can deeply analyse the performance data of various building materials, and accurately identify low-carbon, energy-efficient high-quality materials. It can also comprehensively consider multiple factors such as local resource conditions, cost-effectiveness and environmental impact to provide project-specific materials selection suggestions. This smart materials selection method not only helps reduce the carbon emissions of buildings, but also effectively improves their energy efficiency. On the other hand, AI-enabled digital supply chain management systems are able to comprehensively track and manage building materials. AI can record and monitor relevant information at all times—from source procurement of materials and the production process to transportation—in order to ensure the transparency and greening of building materials. AI has also played an important role in the treatment of construction waste. Through advanced classification, evaluation, and reuse technologies, AI can accurately identify recyclable construction waste and develop appropriate reuse plans. This not only helps reduce the discharge of construction waste, but also promotes the development of the circular economy and the sustainable use of resources.

As the development of smart construction reaches a relatively mature stage, the industry's vertical AI LLMs and scenario-based SLMs are gradually being applied across more scenarios; that is, technology is now able to support smart applications across the entire lifecycle of buildings, forming a comprehensive driving force that spans from policy to market demands. The characteristics of the industry's current applications are as follows: First, feasibility in multiple scenarios. AI LLMs have been successfully applied in multiple scenarios of the building lifecycle. LLMs are no longer just being applied in pilot projects—they are steadily supporting the key decisions and operations of large projects, and gradually developing towards standardisation and bulk production. Second, stable data accumulation and model optimisation capabilities. In terms of data demands, LLMs can use information from a large number of dynamic BIM models, sensor data, historical construction data and other multi-source data to achieve more accurate, data-driven decision-making, improve the models' responsiveness to complex environments, and provide prediction, early warning and optimisation suggestions more effectively. Third, the ability to integrate cross-domain technologies. Mature AI models can be combined with a large amount of knowledge base data such as housing and construction industry standards, legal terms, and design and process specifications, to expand knowledge and support for all aspects of architectural design, planning and construction. This shows that AI models can be more than auxiliary tools—they can also serve as a core component of business processes. Fourth, huge development potential in overseas markets. Especially in emerging markets and developing countries, there is a strong demand for infrastructure construction. AI LLMs and scenario-based SLMs can help enterprises in this sector improve their competitive strength, gain greater market share and grow their profits.

At the same time, we should also bear in mind that, with the continuous development and innovation of AI LLMs in the technical sphere in recent years, the bottleneck for applying these tools in smart construction is not technical ability, but rather a range of challenges beyond technology. Specifically, these challenges include a lack of awareness of LLM technology in the building construction industry, insufficient data quality and openness, insufficient exploration of technology integration and innovation potential, limited market promotion, and insufficient policy and regulatory support. To overcome these challenges in application, a series of targeted measures should be taken. The primary task is to strengthen LLMs knowledge, especially in the building construction industry, so as to improve the sector's awareness and acceptance of LLM technology. Through systematic education and training, the building construction industry can gain a deeper awareness of the unique advantages and huge potential of LLM technology, stimulating their enthusiasm to adopt this technology. Second, data governance is crucial. Companies should be committed to improving the quality and openness of building construction data, and ensure that LLMs can obtain sufficient and high-quality data for training and optimisation. This would lay a solid foundation for the wide application of LLMs in the building construction industry. In terms of technology integration and innovation, there is great potential in the integration of LLMs and the building construction industry, but it needs to be further promoted. Companies should actively explore more application scenarios and business models, so as to leverage the advantages of LLM technology and create more value for the building construction industry. Furthermore, market publicity and promotion cannot be ignored. Companies need to enhance publicity efforts in order to improve the awareness and acceptance of LLM technology and promote its widespread popularity and application in the building construction industry. Finally, the government also plays a crucial role. The government should introduce relevant policies, provide financial and technical support, and formulate relevant regulations and standards, so as to provide strong policy and regulatory guarantees for the wide application of LLMs in the building construction industry. The government also needs to strengthen data security and privacy protection to eliminate the anxieties and concerns of the building construction industry and create a sound environment for the healthy development of LLM technology.

# 5 Digital technology is driving the integration of investment, construction, and operations, while realising innovative integration, opening up a new chapter in industrial upgrade

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The combination of the model that integrates investment, construction, and operations with digital technology is an inevitable outcome of recent technological progress, and it is also the only way to upgrade the industry. This model not only breaks the barriers of traditional construction and operations, but also enables more refined and smart management of investment, construction and operations by leveraging data-driven, smart decision-making and other approaches. In the future, this model will continue to expand its boundaries and move towards emerging fields such as smart cities and smart transportation. We believe that with the continuous progress of technology in the coming years, this integrated model will shine more brightly over the industry and lead us to a better tomorrow.

**Mark Liu**

Director, Transformation Advisory
KPMG China

Driven by the latest developments in AI and the industry cycle, the real estate industry is ushering in a new model of intelligent development. Under this model, enterprises are focussing on harnessing advanced technologies such as BIM, AI, IoT and digital twins to build new quality productive forces and integrate and upgrade physical space, digital space and cognitive space. As a company that has been deeply engaged in this field for years, Qianding Smart Technology has enabled digital intelligent management throughout the entire industry chain, covering investment, construction, management, operations and services. In this way, we have formed a closed-loop system that delivers comprehensive benefits, helping customers across the industry reconstruct the way that they create value.

**Li Bo**

General Manager of Longfor Group Digital Science Intelligent Engine
General Manager of Beijing Qianding Smart Technology Co., Ltd. ("Qianding Smart Technology")

With the in-depth implementation of the *14th Five-Year Plan and Vision 2035,* national economic development is focussing on innovation, green development, and high-quality growth. The model that integrates investment, construction, and operations, which closely aligns with these policies, encourages enterprises to expand beyond the boundaries of traditional single construction or operations models and transform towards full lifecycle project management. This model not only helps optimise resource allocation and improve the economic and social benefits of projects, but also responds to China's continuous investments in infrastructure and emerging industries, provides rich application scenarios and broad development space, and accelerates the pace of industrial upgrading and structural adjustment.

Amid the latest wave of industry reform, the intensification of market competition and the diversification of customer demand, the traditional single construction or operations model appears to be overwhelmed. With the deep integration of upstream and downstream resources and close coordination across the industrial chain, the integrated model is paving the way for enterprises to build greater core competitiveness, enhance their brand influence and achieve sustainable development. Digital technology undoubtedly provides the foundation that enterprises need to efficiently adopt the integrated model. By integrating big data analysis, cloud computing, IoT, AI and other cutting-edge technologies, real-time information updates and accurate sharing of information can be achieved based on comprehensive insights into data flows and resource allocation at all stages of a project. These capabilities support efficient management and scientific decision-making throughout the entire lifecycle, spanning from investment and construction to operations; and they are also propelling the leapfrog development of the integrated model from a labour-intensive approach to a model that is smart, automated, and technology-intensive. Fusing the integrated model with digital technology will open up a new chapter of economic development, injecting greater vitality into industrial upgrading and structural adjustment.

Under the integrated construction model that is centred around digitalisation and amid the "new stage" of development, digital technology is being widely used across the entirety of the three stages of real estate—investment, construction and operations—with a view to aligning project objectives during various stages and creating more value. Digital technology boasts irreplaceable advantages, especially in respect of the accurate calculation of "operation accounts" and "investment accounts." In terms of management of the investment account, digital technology provides robust support for the scientific investment decision-making of enterprises. Leveraging advanced technologies such as big data analysis, cloud computing, and AI, enterprises can build accurate investment decision-making models that are able to integrate and analyse massive amounts of market data, policy guidance, and industry trend information. These models can be designed to comprehensively assess the risks and benefits of potential projects and help enterprises make smarter investment choices. At the same time, digital technology can also be used to realise real-time monitoring and in-depth analysis of costs during project construction, and provide accurate cost prediction and budget management services for enterprises, thus helping them effectively manage risks, control construction costs and avoid resource waste. In addition, by using a digital platform, enterprises can dynamically monitor resource use in real time, helping them optimise resource allocation and ensure resources are efficiently used during the project development process.

Digital technology also provides robust support for managing the operations account. It can support enterprises in carrying out refined management of leases, sales, and property management for real estate assets, benchmarking against best practices, and constantly improving the operating efficiency and profitability of assets. Through real-time monitoring of operational data, digital technology can detect and provide early warnings for potential issues in a timely manner, helping managers to continuously improve management strategies. Meanwhile, digital technology can also be used to build a smart early warning system that covers the full lifecycle of investment, construction and operations, which enterprises can use to conduct real-time monitoring and issue early warnings for risks during project operations and devise risk response strategies to ensure stable project operations. In addition, digital technology can also improve customer satisfaction and loyalty by optimising the customer experience, thereby further improving project operations. The model that integrates investment, construction, and operations also harnesses digital technology to break down information barriers that exist under the traditional management model and realise real-time data sharing and integration. Through such data sharing and integration, enterprises can understand the actual status of the entire lifecycle of projects more comprehensively; and as experience is steadily accumulated, these tools can offer more accurate informational support for preliminary decision-making in similar projects.

As digital technology has been deeply combined with the integrated model in the past few years, we have observed that the model that integrates investment, construction, and operations has expanded beyond the traditional perspective of internal management and has delivered breakthroughs and innovations in more business segment scenarios. For instance, in terms of helping increase asset value, especially in relation to the innovative practice of transforming and upgrading old and obsolete buildings, some leading enterprises have integrated virtual reality technologies in design, construction and operations management to enable more detailed decision-making support for the functional remodelling and lean operation of reconstructed assets. For example, 3D scanning technology has been used to accurately reconstruct the information of buildings before reconstruction, allowing for a complete "digital twin" virtual environment to be constructed with the help of BIM technology. These capabilities provide a solid digital foundation for every stage of the building renewal process—from design planning and reconstruction to construction and subsequent operations. In terms of subsequent operations, some enterprises have combined these tools with Artificial Intelligence of Things (AIoT) technology to support their energy consumption and operations management systems, with a view to realising the green, smart, and convenient management of buildings and parks. In the future, the revitalisation and optimisation of stock assets will continue to be an important topic, and owners will be looking to leverage technologies to improve the operation of stock assets after reconstruction. Successful cases in these fields are likely to bring more insights and ideas to the market while providing useful references for the industry.

We have also found that, by innovating and putting the model that integrates investment, construction and operations into practice, leading enterprises are not only successfully expanding the scope of their product services, but also proactively cultivating professional fields, accumulating more practical experience and steadily developing new business models. For example, digital technology can be harnessed by gymnasiums and related venues to integrate sports with commerce, culture, and leisure. By introducing IoT, AI, digital-twin technology, and various smart subsystems, smart gymnasiums can improve the efficiency of venue operations, accelerate the timely disposal of various risk events, and optimise overall service quality and safety management. Moreover, based on the characteristics of the venues and flagship events, the content operations of gymnasiums' commercial and leisure facilities can use data and customer portraits to improve asset utilisation efficiency and profitability. We believe that the continuous iteration capability of the whole cycle of "investment, construction and operations"—which is enabled by various PropTech tools, in combination with the continuous standardisation of business scenarios, and the steady enrichment of "end-to-end" information and cross-industry data—will be the core driver of the future replication and promotion of the integrated model.

Going forward, the further combination of the integrated model with digital technology will continue to drive industry reform towards a new stage. With ongoing progress in technology development and richer application scenarios, this model will not be limited to the traditional real estate and infrastructure fields, but will also expand to emerging industries and sub-industries, such as smart cities, smart transportation, and smart healthcare, providing strong support for their transformation and upgrading. In addition, with global attention to sustainable development growing, the integrated model will focus more on the environmental protection and sustainability of projects. In the process of project investment, construction, and operations, enterprises will more closely monitor resource conservation and environmental protection, and use digital technology to reduce emissions and exercise more accurate control over energy consumption, so as to contribute to the development of a green, low-carbon, and sustainable development environment. In the context of globalisation, the integrated model will also help enterprises expand their international footprint and international competitiveness. Companies can engage in exchange and cooperation in relation to leading international technologies in order to continuously improve their technical and innovation capabilities, which will improve the quality and development of projects. At the same time, with the support of digital technology, enterprises will gain a more accurate understanding of demands and changes in the international market, putting them in a better position to develop scientific, reasonable marketing strategies, and build more competitive advantages in international markets.

# 6 As asset management develops and asset value improves, the gap in scenario-based data capabilities has started to widen

**Capital covers the capital cycle and asset portfolios.** We believe that fund managers and asset managers who are familiar with the characteristics of different types of capital, funds, and assets need to consider the dynamic development of market supply and demand and constantly optimise their asset portfolios in order to achieve a healthy capital cycle that will support the revitalisation of assets.

**Management covers value management and risk control.** Amid the current macro environment in which economic growth is slowing, managers are leveraging increasingly refined management capabilities to assist the capital side in effectively managing investment portfolio risks. At the same time, through digital transformation, asset management teams are being empowered to respond quickly to market dynamics and strengthen the full-process management of operations, helping to attract investments and steadily improve the value of asset portfolios.

**Jacy Li**

Head of Real Estate and Building Construction
KPMG China

AIoT and LLM technology are leading park operations and asset management into a new era.

Smart parks as a whole are LLM-driven AI agents that connect existing equipment and systems. The agent not only understands people's intentions, but can also convert these intentions into executable instructions, thus realising free interaction between people and the park.

Based on their outstanding generation and understanding capabilities, LLMs will play an important role across the entire business process of parks. In certain cases, they can even completely replace traditional manual operations, greatly improving the efficiency of park operations and asset management.

With the in-depth application of full-scenario intelligence and total factor aggregation, parks are transforming into “organisms” that are capable of autonomous learning, automatic decision-making, and self-evolution. In the future, people and parks will interact more frequently and conveniently, and parks will become a new smart “species” that is able to comprehensively connect people, objects, and space. Hence, there will be a smart experience around every corner, and everyone in the parks will enjoy unprecedented personalised and smart services at a large scale.

**Wang Xiang**

Vice President of AI City R&D Centre
Terminus

After 30 years of rapid economic development, the categories of real estate assets have been significantly enriched and the total area covered by stock assets held by society has increased. As the scale of various types of existing real estate assets rises, differentiated and professional operating capabilities have become the key to transformation. The supply and demand dynamics differ significantly among cities and regions, and asset quality can be uneven. Meanwhile, local real estate asset managers with different backgrounds have also grown steadily more competitive. These asset managers have begun to establish a leading position in the market by building platform companies with domestic and foreign investors to deepen their economic moat. In addition, the operating shift from asset-heavy or asset-light models to a combination of both has further enhanced asset allocation efficiency in different cycles.

In asset management, as the name suggests, two major issues—"assets" and "management"—need to be addressed. In this year's case selection, we noticed that technologies are being combined to drive improvements in asset value and this area drew more market attention compared with the previous year. However, systematic applications and data connectivity are still in the early stages of development with relatively small asset coverage. Meanwhile, the depth of data mining also needs to be further improved.

## Professionalism is essential for a healthy capital cycle and asset portfolio

Based on macroeconomic conditions and trends in the capital market, asset managers are using domestic and foreign financing tools to recycle capital at the appropriate time, targeting assets with different maturities and return profiles and enabling the steady expansion of the scale of funds and assets under management. For real estate fund managers and real estate project operations managers, their fundraising capabilities and the performance of the asset portfolios under their management/operation are mutually reinforcing. In this regard, the sorting and disposal of non-core assets has become routine, and these efforts will continue to improve balance sheet structures and profitability.

Over the past 20 years, investment in holding-type real estate has also experienced a relative "high turnover" period, and a number of local asset managers have emerged in this field. Due to differences in expectations, there is still a huge gap between owners' expectations for returns and asset managers' charging models. The asset-light model has not developed as fast as the market expected in the past few years. The continuous refinement of valuation mechanisms, along with successful urban renewal projects that enhance assets through asset repositioning, is improving the overall professionalism of the real estate asset management industry. Comprehensive scenario-based data capabilities are also key for the professionalism of asset managers. Fortunately, data-driven performance capabilities are replicable, so they will help bridge the gaps in the real estate asset management market, enabling the sector to steadily attract capital inflows, further expand its asset management scale and improve asset allocations.

## Operating capabilities are the lifeline for the value management and risk control of asset portfolios

Amid the current macro environment in which economic growth is slowing, managers are assisting the capital side (representing funds and assets) in effectively managing the risk of investment portfolios by continuously improving their management capabilities. At the same time, through digital transformation, asset management teams are being empowered to respond quickly to market dynamics and strengthen the full-process management of operations, helping to attract investments and steadily improve the value of asset portfolios.

Value management often includes sub-fields such as investment promotion management, facility management, profitability management, valuation management, and cash flow management. For example, efforts to effectively formulate and implement a rent retreat-line strategy in daily operations covers almost all sub-fields in value management.

In respect of risk management and control, we should not only be vigilant about "black swans," but also watch out for "grey rhinos." Enterprises should establish a comprehensive enterprise risk management framework, and develop robust emergency risk plans and quick risk response and recovery measures that align with their own strategic goals. The granularity and timeliness of risk tracking, management and early warnings determine the effectiveness of management and control at the investment portfolio level (funds/platforms/headquarters) and project level.

We can see that the owners and/or asset managers of holding-type real estate invest the most in the local deployment of lease management systems (or in the purchase of SaaS services) and the procurement and collection of competitor information in the project market. In addition, digital tools for facilities and decarbonisation management, as well as management tools for commercial tenants' GMV information, have increasingly gained traction among asset managers in recent years.

- As domestic consumption as a share of GDP continues to rise, operators of commercial properties are paying much more attention to consumer flow and content than ever before. At the moment, the biggest challenge, and also opportunity, facing commercial property operators is how to engage in differentiated competition to attract consumers and promote benign growth in the sale of goods and services within properties so as to empower tenants. As the traditional B-end mindset and perspectives of commercial property enterprises evolve towards the C-end, the skills and capabilities required for the business transformation and digitalisation of the sector are becoming increasingly scarce.

- Managers need to be familiar with the management and disclosure requirements of different investors and capital markets for ESG risks. They should strengthen the working mechanism at the governance level according to the agenda of each party, while actively promoting tailored decarbonisation pathways and goal setting for improvements to other ESG indicators based on the characteristics of various assets and the phases of projects under management. This process will also help more commercial enterprises improve their Scope II and III emissions reduction indicators as well as the quality of their disclosures.

In recent years, China's policy system has been improving, with the national and local governments actively encouraging asset revitalisation and green development; and the continued development of the market for publicly offered real estate investment trusts (REITs) is also making the real estate valuation system more mature. We believe that real estate managers and operators in different asset categories should consolidate operating data in historical periods and analyse resources in order to improve leasing strategies and management thresholds for the purpose of forming a scenario-based business model that aligns with the different lifecycle stages of project companies. Using this approach, they can provide targeted support for business decision-making at different levels of real estate asset management, and help the capital side (asset owners) optimise resource deployment and reduce operating costs, which will improve the profitability of both managers and projects.

# 7 ESG: Active energy conservation and emissions reduction are occurring alongside the passive energy revolution

Active energy conservation and emissions reduction and the passive energy revolution are the two complementary pillars of sustainable development in the real estate industry. Through mutual promotion, common goals, complementary effects, and policy support, we can achieve significant energy savings in the short term and lay a foundation for the long-term transformation of the energy system. With this integrated approach, we will be better able to address climate change, protect the environment, and create a more sustainable and prosperous future.

**Alan Yau**

Head of Real Estate and Building Construction
Hong Kong SAR
KPMG China

ESG has become an important direction of industry development, and PropTech is helping logistics and industrial parks achieve low-carbon operations and sustainability.

Using intelligent security, fire protection and road gate systems, logistics and industrial parks can comprehensively improve safety management. With the help of meteorological disaster cloud-based early warning systems, we can accurately monitor abnormal weather, strengthen climate risk management, and ensure stable operations. Smart lighting technologies can effectively reduce energy consumption, and photovoltaic (PV) power generation and energy storage AI charge-discharge technology will gradually increase green electricity as a share of total energy consumed. Meanwhile, smart meters and system platforms can accurately record energy consumption data and warn of abnormalities in a timely manner, further optimising energy management and control. In terms of operational data management, robotic process automation (RPA), optical character recognition (OCR), and other technologies are being adopted to make significant improvements to the efficiency and accuracy of data acquisition.

In the future, logistics parks will build more efficient and sustainable operations systems that feature digital platforms, automatic integration, microgrids, and other key capabilities, in combination with AI, blockchain, and other technologies. The continuous innovation of PropTech will not only enable the industry to achieve its low-carbon goals, but also improve the customer experience and overall value of the industry, inject new momentum into the industry's development, and deliver greater profits for investors.

**Bey Jiann Ming**

ESG Director
GLP China

Globally, environmental, social and governance (ESG) issues have been gaining more and more traction in the real estate and building construction industry. Among ESG issues, efforts around how to formulate scientific carbon targets to eventually achieve net zero goals are particularly important for industries with high energy consumption, high emissions, and long operating cycles. Meanwhile, energy conservation and emissions reduction in construction has become one of the most important items on the ESG agenda. Active energy conservation and emissions reduction and the passive energy revolution are two key strategies to achieve these goals.

Both the world's and China's energy structures have undergone significant changes in recent years, and these changes have been accompanied by certain key trends as well as challenges that will need to be addressed in the future.

The global energy structure is still dominated by fossil fuels (oil, natural gas, and coal), which account for a major portion of global energy consumption. The use of renewable energy such as wind energy, solar energy, and hydropower is growing rapidly, especially in Europe and North America. In addition, some countries continue to invest in nuclear energy as a low-carbon energy option, but growth in this field is limited due to concerns over safety and waste disposal. In contrast, China's energy structure is dominated by coal, although coal as a share of the country's total energy consumption has declined in recent years. China has become one of the largest renewable energy producers globally, seeing rapid growth in its installed capacity of solar energy and wind energy. Meanwhile, the proportion of natural gas and nuclear energy in China's energy structure has been gradually rising.

In the coming decades, renewable energy is expected to continue to grow rapidly and become the core component of the global energy structure. The development of energy storage technology, smart grids, hydrogen energy, and other technologies will propel the further integration of renewable energy, and governments around the world will enact various policies and incentives to accelerate their energy transformation and achieve carbon neutrality. China's plan to achieve carbon neutrality by 2060 will help transform its energy structure to cleaner renewable energy and low-carbon energy.

In recent years, progress in solar cells, wind turbines, and energy storage technology has significantly reduced the cost of renewable energy, making it a competitor with traditional fossil fuel. According to statistics from the International Renewable Energy Agency, since 2010, the cost of solar PV modules has dropped by more than 80%, and the cost of wind power generation has dropped by nearly 40%. Technological progress is an important driver for the energy revolution and countries around the world have formulated policies and measures to support the development of renewable energy, while enterprises and investors (including financial institutions) are increasingly favouring and investing in renewable energy projects. As global demand for clean energy rises, steady progress has been made in respect of the financing and development of renewable energy projects. In the years ahead, these trends are expected to effectively promote the transformation of the energy structure.

In the real estate and construction industry, we find that more and more real estate owners, investors, and operators are beginning to consider how to provide their tenants with more Scope 3 emissions data so that they can understand the carbon footprint of their properties. Real estate projects and private equity portfolios are also improving their processes and mechanisms for disclosing ESG information to meet market and regulatory requirements. In this process, disparities in the ESG management capabilities of different real estate lessors and operators have begun to emerge. While the reform of the energy structure is a broad, long-term issue, we have found that various holding-type real estate projects are applying an increasing number of renewable energy technologies on a trial basis, including:

1. Solar and wind energy use: Providing clean energy for buildings by installing solar panels and small wind turbines.

2. Geothermal energy use: Geothermal energy is a stable and sustainable energy that is suitable for heating and cooling systems. Geothermal pump systems use constant underground temperature to provide efficient heating and cooling services for buildings, reducing dependence on traditional energy and lowering operating costs.

3. Smart grid and energy management: Smart grid and advanced energy management systems optimise energy production and distribution and improve utilisation efficiency. By connecting with smart grids, buildings' energy consumption can be monitored and regulated in real time to reduce energy waste.

4. Energy storage technology: Battery energy storage systems can solve the intermittency issues posed by renewable energy. With this technology, excessive solar and wind energy can be stored and used during peak hours to ensure stable supply.

ESG reports disclosed in 2023[4] revealed that it is no longer rare for real estate enterprises to be purchasing green electricity to achieve carbon neutrality. In the initial construction of buildings and the renovation of existing projects, real estate developers are able to uniformly plan and use renewable energies, giving such projects significant advantages compared with renovation projects undertaken by individual households and tenants. We are seeing more and more real estate enterprises deploy renewable energies to capture these benefits. For example, we have observed the following:

- 70% of real estate enterprises use smart grids and smart building systems to carry out energy management
- 73% of real estate enterprises have applied solar PV
- 30% of real estate enterprises have applied geothermal systems based on their local conditions
- 27% of real estate enterprises are leveraging energy storage equipment to address the instability of renewable energy

By taking these measures, real estate enterprises are pursuing green development while also laying a foundation for many other enterprises to save energy and reduce emissions in the use of corporate real estate. From this point of view, green design will play a significant role in reducing greenhouse gas (GHG) emissions in the lifecycle of buildings. PropTech enterprises should view this market demand as an opportunity to pursue achievements and deliver more benefits to society.

In addition to leveraging alternative renewable energy, 23% of real estate enterprises are actively participating in transactions in the green electricity market. However, from a scale perspective, green electricity purchase projects only account for a relatively small proportion, and the market is dominated by commercial real estate projects.

In contrast to the reduction in carbon emissions brought about by the relatively passive change in the energy structure, real estate holders, investors, and operators have also strived to use technologies to better manage energy consumption and carbon emissions, so as to drive their ESG agendas. For example:

1. Improving buildings' energy efficiency: They have reduced energy consumption by optimising design and using efficient thermal insulation materials and windows. For example, double-glazed windows and insulated walls can reduce the need for heating and cooling.

2. Using new materials: New materials are widely used in building and equipment renovation, which helps enterprises analyse and improve energy consumption behaviour, reducing operating costs and carbon emissions.

3. Intelligent building and equipment management: Intelligent systems can monitor and optimise energy use in real time, and automatically adjust equipment to reduce energy waste. For example, intelligent thermostats can adjust the room temperature according to users' needs, which helps space users change their behaviour.

4. Carbon management strategies: Enterprises are establishing carbon footprint management systems, formulating and monitoring emissions reduction goals, and participating in the carbon trading market to generate economic benefits while also conserving energy and reducing emissions.

In respect of scientific carbon goal setting, real estate enterprises need to set a reasonable timeline to ensure that the implementation of sustainable development strategies aligns with their economic interests. This process often requires a massive amount of traceable data. Designers select low-carbon materials and technologies from the database at the initial stage of the project to reduce carbon emissions in the planning phase. By properly using a carbon emissions factors database in the design and materials selection process, enterprises can improve the sustainability of their projects and better meet the requirements of relevant laws and regulations. This method can also bring about long-term economic benefits, as sustainable building materials are known for their durability and resistance to abrasion, which reduces the need for frequent maintenance and replacement. As a result, choosing low-carbon materials means lower operational and maintenance costs in the long term. All participants in the construction industry, including developers, architects and equipment engineers, can use such databases to engage in efficient and transparent communication and cooperation. By applying innovations, the building construction industry can strike a balance between environmental protection and economic benefits, gradually promote carbon emissions reduction measures, and continually evaluate and adjust these measures at critical points.

Source 4 :The above data is from the sustainability reports/ESG reports publicly disclosed by the top 30 real estate development enterprises or their listed subsidiaries according to the "Top 100 Real Estate Enterprises in China in 2024" list in the China Real Estate Index System (CREIS).

The green building concept has also become more widely recognised with the roll-out of various policies. New buildings can incorporate a range of ESG elements from the blueprint stage, laying a solid foundation for carbon management in subsequent operations. As for existing real estate, to conserve energy and reduce emissions, real estate managers should make better use of technological tools to enable smarter energy consumption management for different types of real estate and production scenarios and achieve accurate load control. To this end, managers can leverage emerging technologies such as IoT, digital twins and AI algorithms. We find that many industry leaders have been promoting comprehensive enterprise-wide ESG strategies, for which the continuous assessment and improvement of the granularity of energy consumption management is an important implementation measure. This measure not only improves operating efficiency but also effectively strengthens brand competitiveness. By continuously assessing and improving the granularity of energy consumption management, real estate managers can improve user satisfaction and loyalty by providing a more friendly and comfortable physical environment for space users. Meanwhile, by using energy management data that is traceable in real time, enterprises can provide detailed and transparent ESG disclosures, which will help improve their corporate image and attract investors.

In short, while renewable energy has become a viable alternative to traditional energy, its wide application still faces many challenges. First, renewable energy facilities require a certain amount of initial investment, as well as maintenance costs. For real estate holders, investors and operators that prioritise investment returns, the long investment return cycle required by renewable energy facilities still poses a major problem. Second, with relevant policies being steadily introduced, the government's subsidy policies and changes to the electricity pricing mechanism to promote green energy may affect the long-term planning of real estate enterprises. While waiting for the further development of renewable energy technologies, real estate enterprises can actively apply existing technologies in the building design and operations phases and adopt more effective energy-saving measures to optimise resource management and effectively reduce carbon emissions.

# 8 Integration and innovation in the PropTech and elderly care sectors are helping the elderly care industry develop towards intelligence and diversification

In 2024, with the continuous increase in the elderly population and the steady upgrade of customer demand, integration and innovation in the PropTech and elderly care sectors have driven PropTech in the elderly care industry to develop towards intelligence and diversification. We have observed that technology products are becoming more widely accepted and used by the elderly, and with the increasingly widespread application of PropTech in the elderly care industry, the smart and digital elderly care service model will inevitably become mainstream. Over the next few years, in the wake of steadily expanding investments in this field, PropTech in the elderly care industry will be presented with a broader growth space.

**Susana Gao**

Head of Real Estate and Building Construction
Northern Region
KPMG China

To improvise on an old Chinese saying: when three people walk together, one must be an elder. As long as the world upholds peace and development, trends around aging will continue unabated. We need to stand at the forefront of societal trends and work together to promote the transformation of our society.

In terms of health care community services, the organic combination of community living services and health care services holds great significance for the operation and management of elderly care assets. By rationally allocating assets, introducing professional medical resources and building smart health care systems, we can continuously improve service efficiency and optimise service costs, and ultimately raise the value of assets and offer a high-quality lifestyle for the elderly.

At present, by relying on smart health care services, community living service providers are able to offer remote wellness monitoring, smart security early warnings and other amenities that make the daily lives of the elderly more convenient and safer.

Looking ahead, with the continuous progress of technologies, health care service providers can use AI to offer customised and personalised health care programmes for the elderly; IoT can be harnessed to establish interconnectivity between all aspects of the community; and the needs of the elderly can be more accurately understood through big data analysis. In summary, smart health care services will help improve operations for elderly care assets and create better living spaces for the elderly.

**Liu Lingling**

General Manager
Zhejiang Greentown Chunling Technology Group Co., Ltd.

Amid changes in global demographics, the proportion of the elderly population is rising, and meeting the needs of this segment and improving their quality of life presents an urgent challenge. In recent years, the Chinese government has issued a series of policy documents, such as *the Opinions on Developing the Silver Economy to Enhance the Well-being of the Elderly*, which put forward a number of measures to promote the development of the silver economy, with the aim of using economic means to improve the living conditions of the elderly and enhance their sense of happiness and societal participation. In addition, according to the *Notice on Comprehensively Promoting the Normalised Issuance of Real Estate Investment Trust (REIT) Projects in the Infrastructure Field* promulgated by the National Development and Reform Commission in August 2024, facilities for the elderly are also included in the scope of REIT project declaration, providing policy support for the continuous development of assets related to the elderly care industry. On 13 November 2024, the Several Measures to Further Promote the Consumption of Elderly Care Services and Improve the Quality of Life of the Elderly, jointly issued by 24 government authorities (including the Ministry of Civil Affairs), specified that supporting elderly care facilities are included in the issuance scope of REITs in the field of infrastructure. Supported by policies and market demand, the elderly care industry has been leveraging PropTech to become more intelligent and pursue diversification. According to statistical analysis, assuming a moderate growth rate in per capita consumption, the scale of the silver economy should reach RMB 19.1 trillion in 2035, accounting for 27.8% of total consumption and 9.6% of GDP. In 2050, the scale of the silver economy will reach RMB 49.9 trillion, accounting for 35.1% of total consumption and 12.5% of GDP (the medium growth rate is calculated based on an average annual growth rate of 5%, and the scale of the silver economy is estimated by referring to the growth rate of per capita consumption in the ageing process of developed countries in combination with the development demands of China's ageing population and growth in consumption). In short, industries related to the silver-haired economy have huge market potential and space for growth.

In light of the dual support offered by policies and market demand, in the process of enabling the elderly care industry, PropTech has offered two significant development directions—intelligence and diversification—which are jointly promoting the transformation and upgrading of the elderly care industry and supporting its high-quality development.

The intelligence trend is mainly reflected in the development of the smart elderly care model that aims to provide more real-time, efficient, personalised and low-cost services for the elderly. This field benefits from the wide application of new generation information technology such as IoT, cloud computing, big data, and smart hardware. Smart home tools, fall-prevention monitoring systems, personal health management systems, and other products are steadily emerging, offering a more convenient and safe living environment for the elderly. In addition, solutions that harness AI and robotics technology, such as exoskeleton robots and elderly care robots, are being used to provide more considerate care for the elderly.

In terms of diversification, the effects of PropTech in the elderly care field are mainly reflected in the gradual enrichment of service models and service contents. The rapid development of PropTech is providing the foundation for the innovation of new business models. In addition to traditional home-based care, community-based care and institutional care for the elderly, PropTech-enabled tools such as telemedicine and smart management platforms are promoting the emergence of new elderly care methods such as sojourn elderly care and "migratory bird-style" elderly care. Meanwhile, the contents of elderly care services are also diversifying. PropTech has begun to transform from enabling basic care services to enabling diversified scenarios. For example, technologies such as wearable devices and health monitoring devices are being used to provide more diversified health management and catering management; and virtual reality (VR), augmented reality (AR), and online social activity platforms are being used to support interaction with family, friends and community members, alleviate loneliness among the elderly, and deliver humanistic care. While elderly care products and service models are being steadily enriched, new growth points are also being created for enterprise development.

In our research, we have observed that health care community developers are increasingly aware of the importance of digitalisation in building the competitiveness of health care products, especially in respect of operating accounts during the long-term operation period. Through the continuous standardisation of the typical operating processes of health care communities and the steady accumulation of health record portraits of elderly care community customer groups, coupled with the data capture capabilities offered by the latest IoT devices and other tools, leading providers of digital products for health care scenarios have shifted their focus from internal use to market-oriented offerings. Meanwhile, the iteration of service systems has moved from the outer suburbs to the inner suburbs and finally to the city centre. One of the most common scenarios for the application of technologies in health care communities is to monitor and warn the elderly of various potential risks in public areas in real time, including but not limited to those related to falls, slow walking, entering dangerous areas by mistake, and abnormal gatherings of people. These tools—which use intelligent cameras positioned throughout elderly care parks and facilities, in combination with advanced AI behaviour recognition technologies—can significantly improve safety management, help quickly detect and respond to emergencies, and effectively prevent accidents. Another scenario in which technologies can be better used is health management. Using preventive treatment of disease capabilities, health care community operators can provide daily services for the elderly that are more efficient and accurate. With health care equipment accessed from compatible PaaS, together with information independently input by the elderly, health data can be comprehensively collected, carefully organised and deeply analysed to present intuitive visual charts and detailed reports, so as to provide more scientific and intelligent health care guidance for community operators, the elderly and their families.

We should also note that the marketisation of digital products in operations scenarios of health care communities faces many challenges. While using these technical tools, digital solution providers and health care community operators also need to focus on protecting personal privacy and data security. To this end, relevant enterprises and institutions should establish sound data management systems to ensure the legitimate and compliant use of personal information and avoid disclosure and abuse. Moreover, C-end users in the market still need to be cultivated to promote the overall acceptance of health care community and home-based elderly upgrade. The deployment cost of IoT equipment is negatively related to acceptance, which can also hinder the effectiveness of data collection in digital operations.

Even so, according to the 2024 Real Estate Operations Development Report published by CRIC China (CRIC 克而瑞), there are more than 40 million and 15 million silver-haired users of smart home tools and smart wearable devices, respectively, indicating that technology products are becoming more widely accepted and used by the elderly. Going forward, it is likely that more enterprises will continue to improve their technical and innovation capabilities, gain a deeper understanding of the actual needs of the elderly, proactively respond to changes in policy implementation and the market environment, and deepen their exploration of the elderly care field. With the continuous development of technologies, the smart and digital elderly care service model will inevitably become mainstream. Meanwhile, with the continuous increase in the elderly population and the steady upgrade of customer demand, the diversified elderly care service model will also continue to develop. The government and various social sectors will also continue to strengthen their support for the elderly care industry. Furthermore, amid the current urban renewal, the transformation of stock assets into health care service facilities will offer a strong boost to the integration and development of the PropTech industry and the elderly care industry. At present, PropTech services focus on physiological needs such as health management and rehabilitation aid. On this basis, PropTech enterprises need to concentrate on standardising service systems, leverage technological innovation to improve service efficiency, pay more attention to advanced goals such as humanistic care, cross-border integration and industrial chain integration, expand business in fields such as social networking and education, and meet the spiritual needs of the elderly. With these efforts, enterprises can effectively integrate PropTech and the elderly care industry in a smarter and more diversified manner.

# KPMG China's PropTech 50

# Leading PropTech Companies

## Innovation Leaders

| Company Name | Case Name |
|---|---|
| Qianding Digital Technology | Longfor Blue Engine |
| Hongkong Land Limited | Intelligent AI Air Conditioning Energy-saving Project at The Ring Shopping Park in Chongqing |
| Llewellyn & Partners Co., Ltd. | AutoCDE: ISO-compliant Integrated Asset Information Management Platform |
| GLP Asset Service Platform | ESG Operations for Industrial and Logistics Parks |
| Shanghai VationX Network Technology Co., Ltd. | AIoT Space Management Solution |
| Shanghai Circles Technology Co., Ltd. | WeCom Platform Project |
| Shenzhen Haizhichuang Technology Co., Ltd. | China Overseas Co-BIM Intelligent Platform Project |
| Shenzhen Finance and Real Estate Stability, Co., Ltd. | ANJIANYUN Engineering Management System |
| Yuexiu Property | Yuexiu Property Co-BIM System |
| Zhejiang Tsinghan Tech Co., Ltd. | Tsinghan Tech  Nano Intelligent Heating Chip |

## Future-Forward Companies

| Company Name | Case Name |
|---|---|
| Beijing Jinmawei Management Software Development Co., Ltd. | Construction Project Management and Audit Information System for the Lifecycle Period |
| Yuetron Digtech | Yuexiu Fangbao |
| Hunan Architectural Design Institute Group Co., Ltd. | HD-Intelligent Building V1.0 |
| Hainan Elmleaf Information Technology Co., Ltd | AUR Intelligent Product Positioning Platform |
| Shanghai Hello-tech Information Technology Co.,Ltd | CIMC Integrated Rental and Sales Leasing & Operation Management System |
| Shanghai Pudong Software Park HuiZhi Software Development Co., Ltd. | Shanghai Pudong Software Park Zuchongzhiyuan Microgrid Reconstruction Project |
| Shanghai Weibuild Technology Co., Ltd. | Weibuild Intelligent Rebar Machining Centre |
| Shenzhen Creating & Sharing Digitisation Technology Ltd. | Cifi Group AI& Data Audit Management System |
| Shenzhen Haizhichuang Technology Co., Ltd. | Intelligent Construction of Residential Buildings: Foundational Spatial Data Construction and Application |
| Terminus Group | CIM Smart Central Control Platform |
| Zhejiang Greentown Chunling Technology Group Co., Ltd | Wellness Community |
| CMSK Technologies Co., Ltd. | Stadium Space Operations |

## High-Growth Companies

| Company Name | Case Name |
|---|---|
| Smart Construction Cloud Limited | AI-empowered Construction Project Management Platform |
| Hubei Jianke Technology Group Co., Ltd. | Digital Twin Foundation for Industrial Parks |
| Retailing Connect (Shanghai) Ltd. | IoT Receipt – Big Data Loyalty Points |
| PinLan | AI Intelligent Review Platform for Civil Buildings |
| Shanghai Youkun Information Technology Co., Ltd. | Big Data Precision Marketing Case in Commercial Real Estate |
| SEGI | China Electronics Corporation Asset Management Cloud Platform |
| Shenzhen Facility Management Community Technology Co., Ltd. | Smart Facility Management Platform for Industrial Parks |
| isBIM Limited | JARVIS: AI-powered Management across the Building Lifecycle |
| CMSK Technologies Co., Ltd. | Operations System for Commercial Spaces |

# Appendix

# Interview Team

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|---|---|
| **Jacy Li** | Head of Real Estate and Building Construction, KPMG China |
| **George Wong** | Head of Real Estate and Building Construction, Southern Region, KPMG China |
| **Alan Yau** | Head of Real Estate and Building Construction, Hong Kong SAR, KPMG China |
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# KPMG PropTech Industry Insights


2023 KPMG China Leading PropTech 50


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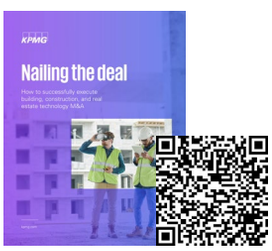
2024 China CEO Outlook


2023 Global Construction Survey


KPMG Global tech report 2024


2024 Real estate + Real innovation


2023 Real estate + Real innovation

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2022 Real Estate Innovations Overview

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