

New risk-management considerations for the real estate industry in the era of artificial intelligence

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Abstract. Objective - The goal of this paper is to present a blueprint for real estate investment companies for novel risk considerations due to the rise of use of Artificial Intelligence applications. Background - New technologies (especially Artificial Intelligence) are rapidly changing how investors, tenants and managers use, invest, and finance property. These technologies are introducing revolutionary change for the industry in terms of organizational structures and a novel set of risk considerations that managers within real estate investment companies need to consider. Methodology/approach - This qualitative approach is based on the impact of technology on risk management policies and organizational structures as reviewed in real estate industry and academic literature, professional experience, and current PropTech applications. Findings - The revolution in real estate technologization will not come from the application of new technologies but the rapid change in management leadership style and culture while addressing a new set of risks introduced by these technologies. Conclusion - Due to the current state of the economy, effects of the pandemic, and rapid adoption of new technologies, real estate companies are likely to radically change the way they are organized, how they innovate and manage technology risks, and how they are led by management. The paper underscores the need for real estate firms to create comprehensive restructuring plans to operate like technology firms and to emphasize the development of self-leadership and communication skills in the workforce. It is important for companies to address the array of risks associated with AI integration – loss of jobs, ROI uncertainty, technical challenges, dependency on AI – by exercising a nuanced approach, tailored to the unique needs and circumstances of each organization. The development and implementation of solutions should be a collaborative effort, drawing input from multiple stakeholders within the organization.

Keywords. Real estate investment, artificial intelligence, leadership, technology, proptech, machine learning, organizational design, strategic planning.

1. The Evolving Landscape of AI in Fintech: Opportunities and Risks

The investment finance industry is in a constant state of evolution, marked by a relentless drive to integrate cutting-edge technologies such as artificial intelligence (AI), Machine Learning (ML), and Big Data Analytics (BDA) into financial services (banking, investment management, insurance, real estate, etc.) industries. This research identifies the profound impact of AI/ML technologies on companies, real estate investment companies for example, and explores emerging risks associated with its adoption.

1.1. Widespread availability of AI

AI is undergoing a remarkable transformation, becoming increasingly accessible and affordable. The computational capabilities of AI is no longer the privilege of a select few actors in the economy, it is now available to everyone all over the world. AI tools are now in every facet of our daily lives – from self-driving cars to e-commerce platforms, intuitively understanding our life style preferences [15]. It is highly probable that our private information -- CV or MRI scan -- has undergone AI analysis. AI has also ventured into the realms of creativity, AI-generated art and award-winning AI-authored literature. The ascendancy of AI, both in our personal lives and within the economy, particularly the financial services and the real estate sectors, is reshaping industries by enhancing efficiency, productivity, customizing and personalizing services, and catalyzing innovation [3].

1.2. AI introduces new risk considerations for strategic planning

It is imperative to confront the challenges that accompany this AI revolution, particularly in terms of new risks. These newfound risks encompass a wide spectrum, including concerns related to: data privacy, algorithmic bias, regulatory compliance, ethical considerations, and the establishment of user trust [4]. Addressing these challenges is essential to fully unlock the potential of AI in the domains of fintech, proptech, and beyond. The successful integration of AI into economic and industry processes relies on ethical, moral, responsible, and accountable approaches that balances the benefits with the risks. For example, the dynamic intersection of fintech, proptech, etc. and AI holds immense promise, but also demands vigilance and responsibility. By navigating these challenges, companies can harness the transformative power of AI, while ensuring its adoption remains ethical and beneficial to the financial services industry, and the economy at large.

2. Pivotal Role of AI Applications In Real Estate Investments

The real estate industry is undergoing a profound organizational and operational transformation, driven by the rapid

introduction of cutting-edge technologies such as AI, blockchain, Virtual Reality, smartphones, apps, and 5G/6G networks. The most profound changes have occurred in the last five years, catalyzed by the emergence of the hybrid work environment driven by the COVID-19 pandemic [5]. During this time, there has been a swift and widespread adoption of Artificial Intelligence across all facets of the real estate industry, leading to a substantial transformation in the way space is employed and investments are made.

2.1. Revenue optimization is the common AI use case

The incorporation of AI/Natural Language Processing (NLP) layers into real estate investment models allows for companies to create sophisticated tools for Return on Investment (ROI) optimization [19]. These tools offer predictive insights and reveal intricate correlations among data points, resulting in amplified revenue streams for brokers, investment managers, and service providers. Moreover, they drive substantial cost reductions by streamlining workflow processes. For example, an NLP application involves tracking hyper-local real estate submarket data activity surrounding a specific property or portfolio. AI can identify correlations between local market factors such as the impact of conference events or other relevant announcements, and the property value. Such an application, equipped with NLP capabilities, can automatically optimize effective rent based on real-time market shifts, ensuring asking rents are always aligned with current market dynamics [19].

2.2 Other AI use cases in real estate investment decision making

Another example is using AI to identify the next best acquisition opportunity. Through complex real-time analyses, it discerns market trends, pinpointing geographical areas that are either heating up or cooling down. Furthermore, AI extends its utility by projecting future price trends for specific projects and neighborhoods. It does so by considering a multitude of predictive economic, market, etc. factors that contribute to the likelihood of a higher rent growth, net income, and return on investment (factors such as local employment growth trends or the issuance of new construction permits). Same logic applied to the REIT financial data can predict the value of the REIT share price and allow to construct an efficient alpha-generating portfolio of REIT stocks that would significantly beat a benchmark [19].

In summary, harnessing the power of AI/NLP transforms real estate operations. It not only optimizes revenue and reduces costs but also empowers investors with actionable insights for smarter decision-making. The future of real estate lies in these advanced tools, which help navigate an ever-evolving market landscape with precision and confidence.

3. Embracing the Future: Real Estate's Tech-Driven Evolution

3.1. Real estate firms operating like technology firms

Technological leaps, especially the adoption of AI in the real estate investing process, are compelling real estate firms to change, adapt and evolve, ushering in an era where modern real estate companies are adopting a hybrid proptech approach to culture, management, organizational structure and operational procedures. The catalysts for this overdue transformation are manifold, encompassing economic shifts, the global pandemic, and the widespread adoption of innovative technologies. As a result, real estate firms are beginning to operate more like tech companies, reimagining their business models and embracing the ethos of tech-driven innovation. However, this shift is not without its challenges, as the traditional structure and focus of real estate organizations differ significantly from those of tech firms.

3.2. The need for comprehensive restructuring

Tech companies thrive on diversification, focusing on functions and geographic locations to expand their reach. In contrast, real estate firms traditionally concentrate on specific property sectors and types. Tech companies pivot and adapt swiftly in response to a competitive landscape, diversifying their product lines and targeting new markets. Real estate companies, with their physical assets and entrenched organizational structures, face unique hurdles in this transformation. To catch up with tech-driven management styles, real estate firms must undergo a comprehensive restructuring process. This entails cultivating virtual and organic cultures within their organizations, adjusting internal dynamics, and fostering agility in the face of change and uncertainty. Chief Technology Officers (CTOs) are often missing from the leadership ranks of many real estate companies, highlighting the urgent need for a technology-focused approach.

3.3. Adoption of new leadership styles

The transformation also requires real estate firms to flatten their hierarchies, promote teamwork, embrace location-independent work models, prioritize customer centricity, and continue developing integrated and open knowledge executive management systems. As managers lead the charge in reorganizing their organization, they need to be cognizant of the profound impact technological innovation will have on divisional and functional team psychology. This includes presenting clear goals and objectives, metrics, benchmarks, and management role models. This gives teams the ability to take risks and learn from their own self-efficacy process to develop self-confidence in the execution of critical projects and programs. It is imperative to adopt new approaches to organizational leadership, team management, and labor organization that aligns with the rapidly evolving landscape of both the technology and real estate industries.

4. New business risks for AI

Artificial intelligence offers numerous benefits to businesses, but it also comes with risks and challenges that organizations need to be aware of and address directly: loss of jobs, Return on Investment (ROI) uncertainty, technical challenges, dependency on AI.

4.1. Loss of jobs

AI holds the potential to enhance human capabilities, but it also carries the risk of replacing specific job functions, giving rise to job displacement and morale issues among employees. According to Goldman Sachs [8], 300 million jobs could be lost or diminished by this fast-growing technology. Such consequences can significantly impact a company's brand and reputation. Additionally, widespread adoption of AI technology can exacerbate social and economic inequalities, as those lacking access or the necessary skills to utilize AI effectively may find themselves left behind [20]. Over time, an overreliance on AI has the potential to erode critical skills and decision-making abilities among human operators [16]. This scenario becomes problematic when individuals become excessively dependent on AI for problem-solving, and in some cases, this reliance can result in job displacement. Although AI can create new job opportunities, the transition can be challenging for affected workers [2].

New technologies can also offer numerous benefits to individuals, such as time and effort savings, affording them the opportunity to pursue education, training, or entrepreneurial ventures. These advantages serve as catalysts for innovation and job creation, ultimately enhancing the value of work that aligns with personal passions and goals. The outcome is the development of innovative products, services, and solutions that might not have surfaced in a society heavily reliant on manual labor. Technology liberates individuals by granting them the time and space to reflect, leisure, and engage in creative thinking. When people are afforded the time and energy to explore their interests and passions, it fosters a more diverse range of voices and perspectives within creative fields. This diversity enriches creative output and cultivates the soil for new and groundbreaking ideas to flourish.

4.2. ROI Uncertainty

Although, according to the recent IBM research report [10], best-in-class companies reap a 13% Return on Investment (ROI) on AI projects—more than twice the average ROI of 5.9%. In 2021, among executives of the world's 2,000 largest companies (by market capitalization), those who discussed AI on their earnings calls were 40% more likely to see their firms' share prices increase - up from 23% in 2018 [1]. For businesses and organizations considering the adoption of AI technologies, the uncertainty surrounding ROI is a prominent concern. ROI uncertainty revolves around the challenges associated with predicting and achieving a positive return on the investment made in AI initiatives. While AI indeed holds the potential for substantial returns, it is imperative for businesses to judiciously manage the risks and uncertainties tied to these investments to fully unlock their benefits. The path to realizing ROI from AI projects is not without hurdles.

Firstly, there is no guarantee of immediate returns, and businesses must grapple with ambiguity when it comes to estimating the ROI for AI projects. Implementing AI can be a substantial financial commitment, encompassing expenses related to AI infrastructure, software development, data acquisition, and talent acquisition [15]. The initial capital outlay can be substantial, and the timeline for recouping these costs can be extended (time to break-even).

Moreover, achieving a positive ROI from AI initiatives is often a time-intensive endeavor. Training AI models, seamlessly integrating them into existing processes, and realizing the full spectrum of benefits can be a protracted process. The timeline for realizing a return varies widely, contingent upon the complexity of the AI application in question. The reality is many businesses are not often seeing a financial return — or worse, not even covering their investments [17]. Businesses that rely on third-party AI solutions may inadvertently become overly dependent on specific vendors, limiting their flexibility and potentially inflating costs over the long term. Adding to the complexity, there is an industry-wide shortage of skilled AI professionals, driving up the costs associated with AI projects. On the managerial level, 68 percent of executives surveyed internationally report a moderate-to-extreme skills gap, and more than a quarter (27 percent) rate their skills gap as “major” or “extreme” [17]. 61 percent of HR professionals believe hiring technology developers will be their biggest challenge in the years ahead [13].

AI systems necessitate continuous maintenance, updates, and vigilant monitoring, all of which entail ongoing expenditures. Organizations may find themselves reliant on these resources, leading to elevated operational costs [9]. As more and more organizations embrace AI, the competitive landscape undergoes a transformation. Businesses that lag behind in AI adoption may struggle to keep pace with competitors effectively leveraging these technologies [14]. This competitive pressure can result in a willingness to adopt or develop AI projects at any cost.

To address the challenges of ROI uncertainty associated with AI investments, organizations can take proactive steps. These include meticulous planning, substantial investments in data and workforce development strategies, and a pragmatic approach of starting with pilot projects. Careful planning, ongoing monitoring, and adaptability are pivotal in managing ROI uncertainty and ensuring the seamless integration of AI into business operations. By methodically addressing these issues, organizations can enhance their chances of realizing the full potential of AI while mitigating the associated uncertainties.

4.3. Technical Challenges

Relying heavily on AI without a comprehensive understanding of its inner workings can be a double-edged sword. AI systems are data-driven, and mishandling sensitive data can open the door to breaches, leaks, and regulatory penalties. Moreover, if data sources are compromised or inaccessible, AI-dependent processes can grind to a halt. The critical need for data privacy and security cannot be overstated. One of the intricacies of AI, particularly deep learning models, lies in their opacity – they can function like enigmatic black boxes, leaving stakeholders in the dark about how they arrive at their decisions [6, 16, 18]. This lack of transparency can sow the seeds of distrust among those affected by AI-powered outcomes. In the realm of AI, data quality reigns supreme. Poor data quality can taint AI models, leading to inaccurate predictions and decisions that can have far-reaching consequences.

To navigate this AI landscape effectively, organizations must adhere to several key principles. Transparency, explainability, and accountability are paramount. Data quality controls, continuous monitoring, auditing, and rigorous testing of AI systems are essential to swiftly identify and rectify any issues that may arise [11]. A clear understanding of how AI systems arrive at their decisions is essential, fostering trust among stakeholders and assuring them of the technology's reliability.

4.4. Dependency on AI

AI undoubtedly brings a wealth of benefits and efficiencies to both individuals and organizations. However, it's imperative to recognize that excessive reliance on AI can introduce a range of challenges and risks. One notable risk is that overdependence on AI systems can render organizations vulnerable to system failures, bugs, or errors. When AI systems malfunction or encounter unforeseen scenarios, they have the potential to disrupt critical operations, highlighting the need for contingency plans and human oversight. Trusting AI systems too implicitly can also lead to a reduction in human oversight. It's crucial to remember that AI is a tool meant to complement human decision-making, not replace it entirely. A lack of human oversight may result in the uncritical acceptance of incorrect or biased AI-generated outputs, with potentially severe consequences for businesses. Human judgment and oversight are indispensable. Consistent model documentation provides a layer of transparency in tracking and explaining AI-generated outputs [12].

Additionally, in the era of AI, where the boundaries between humans and machines blur, companies must proactively implement programs that address workforce self-leadership and communication skills. These skills are increasingly essential for navigating the evolving landscape. Furthermore, society at large should encourage and incentivize employers to establish comprehensive workplace mental health programs. These initiatives should encompass employee assistance programs, stress reduction strategies, and mental health training for managers. This is particularly pertinent in tech-centric organizations where recognizing the intrinsic value of humans versus machines becomes even more crucial. To mitigate dependency on AI, organizations should promote work-life balance and offer flexible work arrangements to reduce work-related stress. Incentivizing employees' soft-skills development can foster better team leadership and a deeper understanding of the significance of purpose, a critical aspect of developing self-leadership.

5. Conclusion

The real estate industry's evolution into a tech-driven force is underway, and firms must adapt to thrive in this new era. Real estate companies are advised to be cognizant of the pace of innovation and operate more like technology firms in order to stay competitive. Additionally, while implementing AI tools, it is recommended that companies invest in programs that address workforce self-leadership and communication skills development to foster better productivity and team leadership.

By embracing innovation, restructuring, and fostering a culture of agility, real estate companies can not only keep pace with change but also lead the way in shaping the future of the industry. It is important for companies to address the array of risks associated with AI integration – loss of jobs, ROI uncertainty, technical challenges, dependency on AI – by exercising a nuanced approach, tailored to the unique needs and circumstances of each organization. It is recommended that development and implementation of solutions should be a collaborative effort, drawing input from employees, advocates, and individuals with firsthand experience of AI use. The ongoing evaluation and adaptation of these solutions are paramount to ensuring their efficacy in facilitating seamless AI integration into everyday operations.

Conflict of Interest Statement

Authors state no conflict of interest.

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Author 1: Olga Koroleva

- Conceived and designed the analysis
- Collected the data

- Contributed data or analysis tools
- Performed the analysis
- Wrote the paper
- Other contribution

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- Conceived and designed the analysis
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- Contributed data or analysis tools
- Performed the analysis
- Wrote the paper
- Other contribution: Edited portions of the paper after the first draft was completed

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