

CENTER FOR CALIFORNIA REAL ESTATE PRESENTS...

**AI IN
REAL ESTATE:
PROSPECTS,
CHALLENGES &
FUTURE
DIRECTIONS**

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**CENTER FOR
CALIFORNIA
REAL ESTATE**



BACKGROUND

The Center for California Real Estate (CCRE), an institute of the CALIFORNIA ASSOCIATION OF REALTORS® (C.A.R.), is dedicated to intellectual engagement in the field of real estate. Its mission is to advance industry knowledge and innovation with an emphasis on convening key experts and decision-makers. CCRE reflects C.A.R.'s increasing role in shaping the future of the industry by advancing innovative policy solutions and active dialogue with experts and industry stakeholders. Additional information on CCRE and C.A.R. can be found online at [CCRE.us](https://www.ccre.us).

EXECUTIVE SUMMARY

The Center for California Real Estate (CCRE), an institute of the CALIFORNIA ASSOCIATION OF REALTORS®, convened a virtual panel titled "AI in Real Estate: Prospects, Challenges & Future Directions." This assembly of thought leaders from technology and real estate embarked on a comprehensive exploration of the burgeoning role of artificial intelligence (AI) within the real estate sector. With Anna Tong, Technology Correspondent for Reuters, moderating the discussion, the panel featured an array of experts: Shay Artzi, SVP & Head of Engineering for Compass; Maximillian Diez, CEO for Twenty Five Ventures; Ondrej Linda, Director of Applied Science for Zillow; Alex Wolkomir, Partner for McKinsey & Company; Linna Zhu, Senior Research Associate for the Housing Finance Policy Center at the Urban Institute.

The discussion unraveled the multifaceted implications of AI's integration into real estate, spanning agent supplementation, ethical considerations, and the transformative potential of generative AI technologies.

The panel underscored AI as a pivotal force in reshaping the landscape of real estate through enhanced decision-making, personalized client experiences, and a profound capacity to expand access to complex data and insights. Amidst AI's promise, the dialogue delved into critical challenges, including the ethical deployment of AI tools, privacy concerns, and the need for robust governance frameworks to mitigate risks and counter algorithmic bias. Furthermore, the discussion highlighted the importance of human-centric technology adoption, ensuring that AI serves to augment rather than supplant the irreplaceable value of human expertise and connection within the industry.

Prominent themes of the panel included the accessibility of generative AI platforms, the essential role of prompt engineering in maximizing AI's utility, and AI's potential impact on the job market. Panelists advocated for a future where AI advancements catalyze job augmentation and elevate the real estate profession by automating routine tasks and enriching the client-REALTOR® relationship through deeper insights.

As AI continues to permeate the real estate industry, the panel's insights serve as a beacon for professionals navigating this technological evolution. The collective wisdom of the panelists, distilled into actionable takeaways, emphasizes the sector's collective journey towards harnessing AI's potential responsibly, ethically, and innovatively. This summary, along with the key takeaways, encapsulates the essence of the conversation, offering a wide view of AI's transformative impact on real estate and laying the groundwork for continued exploration and ethical consideration in AI's advancement within the industry and society at large.

KEY TAKEAWAYS

- 1 Generative AI Accessibility:** Panelists highlighted how the emergence of user-friendly AI platforms increases accessibility to this sophisticated technology, drawing a parallel to the revolutionary impact of smartphones on digital access.
- 2 Empowering Education and Decision Making:** AI is revolutionizing how customers learn about the market and make informed decisions, providing REALTORS® with deep insights to offer tailored services.
- 3 Human-Centric Technology Use:** The importance of maintaining a human-centric approach in technology deployment was underscored, stressing that technological advancements should augment the human elements of service and interaction in real estate.
- 4 Unlocking AI's Potential with Prompt Engineering:** Learning to craft effective prompts – a process of creating specific questions or commands for AI systems – is key in utilizing the technology, allowing REALTORS® to generate tailored insights and high-quality information.
- 5 Job Market Impact:** The discussion emphasized AI's dual-edged potential to either disrupt or enhance job markets. Experts advocated for comprehensive adoption of AI technology into business practices to solidify the role of real estate professionals in the industry.
- 6 Automation Allows for Prioritization:** By effectively utilizing AI automation, REALTORS® can prioritize their time to enhance the value and depth of their relationships with clients.
- 7 Personalization at Scale:** Insights were shared on leveraging large language models for crafting personalized client experiences (e.g. via AI-driven customer relationship management tools, significantly enhancing the sector's value proposition.
- 8 Prioritizing Privacy:** The discussion raised awareness about privacy concerns related to AI, stressing the essential focus on safeguarding personal data when implementing this technology.
- 9 Ethical Use:** The importance of strong governance and efforts to counter algorithmic bias were emphasized, aiming for responsible AI use that ensures consumer protection and promotes inclusivity in real estate practices.
- 10 Exploring Untapped Potential:** Panelists discussed the immense potential of AI in revolutionizing real estate processes and services, calling for an industry-wide embrace of innovative technologies.

INTRODUCTION TO ARTIFICIAL INTELLIGENCE IN REAL ESTATE & KEY DEFINITIONS

The integration of artificial intelligence (AI) and its subset, generative AI, into colloquial business practices, marks a pivotal shift in the real estate sector. These technologies, once the domain of specialists, are now at the cusp of expanding access and usability to complex data analysis and decision-making processing, a term known as democratization.

The panel underscored the evolution of AI from a predictive tool to one which creates content, emphasizing the technological advancements that enable these new applications. As Alex Wolkomir of McKinsey & Company noted, these are the same methods that have been around for decades. However, the computing power of today exponentially increasing the capacity for “a new type of output... enabling new use cases today.”

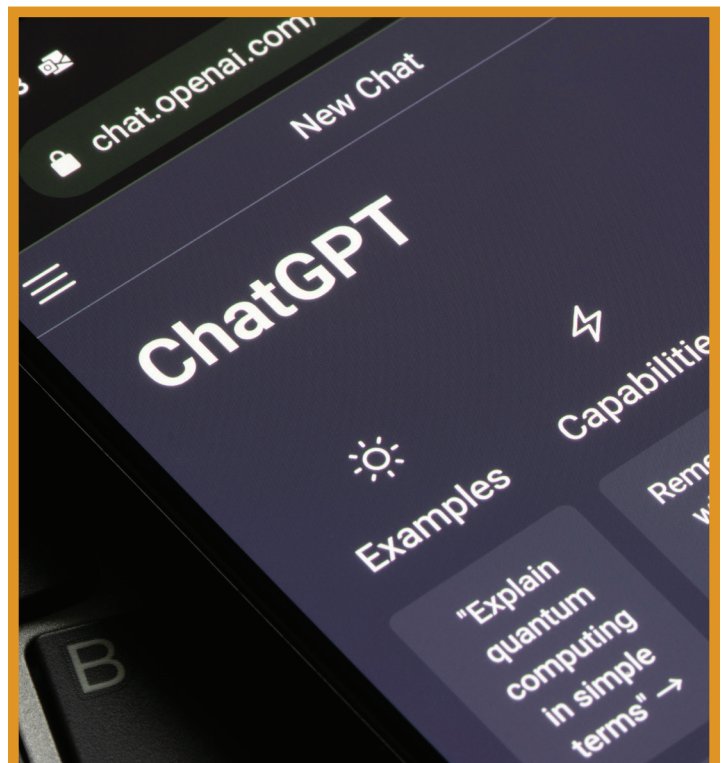
As panelists outlined the essence of AI terms, they set the stage for a comprehensive examination of how these technologies are reshaping the industry:

- **Artificial Intelligence:** Defined primarily as the automation of complex decision-making processes that mimic human intelligence but are executed through software.
- **Machine Learning:** A subset of AI that allows algorithms to learn from data and make associations and predictions without being explicitly programmed, akin to teaching humans through examples rather than direct instruction.
- **Generative AI:** Expands the capabilities of machine learning by producing new outputs—such as texts, images, and videos—that are similar to the training data it consumes.

- **Large Language Models (LLMs):** These models are notable for their vast training datasets. They are specialized applications of generative AI that are designed to predict and generate text sequences.

APPLICATIONS OF GENERATIVE AI

The introduction of OpenAI's ChatGPT in late 2022 marked a significant leap in the application of generative AI. Shay Artzi of Compass referred to the arrival of ChatGPT as “the iPhone moment” for AI, suggesting a monumental shift in digital accessibility similar to the revolutionary impact smartphones had on computing access. Artzi observed that ChatGPT and other text generators, “have basically made it so easy for everybody to use,” highlighting how generative AI has simplified the interface between advanced technology and everyday tasks.



Maximillian Diez of Twenty Five Ventures categorized the applications of generative AI in real estate into three main areas: efficiency, effectiveness, and engagement. He noted that these technologies enhance the operational capabilities of real estate agents by providing them access to refined data and streamlined processes, thereby improving their ability to serve consumers effectively.

Wolkomir expanded on the practical applications of generative AI by introducing four “C” categorizations: customer engagement, creation, concision, and coding. Each category represents a core area for a real estate AI use case:

- **Customer Engagement:** AI is being used to automate and improve workflows, enhancing direct interactions between real estate professionals and their clients.
- **Creation:** Generative AI excels in producing new content, whether text, images, or videos, which can be particularly useful in marketing properties.
- **Concision:** AI’s ability to condense extensive information into digestible summaries helps professionals and consumers alike to make sense of large datasets quickly.
- **Coding:** Generative AI aids users in generating computer code, facilitating faster development of digital tools and applications.

As AI continues to evolve, the real estate industry is positioned to benefit significantly from its capacity to transform both high-level strategic activities and day-to-day operations. The panelists’ discussions highlighted that while the technology is rapidly advancing, its most effective use comes from a deep understanding of its capabilities and limitations.

Wolkomir summed this up by stressing the importance of trial and error in utilizing AI effectively. Prompt engineering – the process of inputting data and information into a model to produce a given outcome – and figuring out how to effectively utilize AI models is “really about experimenting and learning.” This approach is crucial for real estate professionals aiming to harness the full potential of AI to enhance their services and client interactions.

AGENT AUGMENTATION

The rapid adoption of generative AI in various sectors has ignited concerns about its potential to displace human workers, particularly in fields where personal interaction plays a crucial role, such as real estate. During the panel discussion, experts sought to assuage some fears by highlighting AI’s role as a supportive tool rather than a replacement for real estate professionals.

Ondrej Linda from Zillow emphasized that the purpose of AI in their operations is not to replace agents but to augment their capabilities with

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enhanced data and tools. Zillow's AI provides "insights about the customer so the agents can better serve them," Linda explained, illustrating how AI can supply valuable information that empowers agents to improve their client interactions and service delivery.

Artzi shared insights into how his brokerage is integrating AI to support agents. CompassAI, developed in collaboration with OpenAI, is designed to help agents with tasks such as crafting listing descriptions, preparing marketing materials, and managing social media interactions. With an in-house real estate-trained product, Artzi claimed this allows for more customization with Compass agents, superior to using the generic ChatGPT.

Linna Zhu from the Urban Institute emphasized the importance of the human element in this technological interaction. She advocates for a 'human-in-the-loop' approach, which ensures that AI does not operate in isolation but in synergy with human oversight and intervention. This method ensures that AI's application remains grounded in standards and aligned with user needs, enhancing both the reliability and personalization of the information provided.

Diez highlighted innovative uses of AI in real estate, mentioning how venture-backed companies are using AI to transform property visualizations by digitally enhancing images of homes and landscapes. This not only helps in marketing properties more effectively but also allows potential buyers to visualize changes and upgrades before making a purchase. The consensus among the panelists was clear: while AI brings transformative potential to real

estate, it is most valuable when used to supplement the human elements of the profession. By automating routine tasks and processing complex data, AI allows agents to focus more on building relationships and delivering personalized services, thereby not only preserving but enhancing their roles in an increasingly digital landscape.

OPERATIONAL POTENTIAL

The application of AI in real estate is revolutionizing the sector by streamlining operations and offering personalized experiences to clients. By automating routine tasks, AI allows real estate professionals to focus on the nuanced aspects of client service, enhancing efficiency and satisfaction. However, to fully realize AI's capabilities, companies must commit to integrating this technology into their practices.

Wolkomir highlighted a McKinsey report he co-authored which addresses generative AI's potential impact on the industry and the significant backend investments necessary to leverage this technology effectively.

The consumer-facing products are merely the tip of the iceberg. What lies beneath the surface – the time and resources companies must invest – is how to train these large data sets to meet the unique needs of their consumers. He stated, "It's actually about redesigning the experience or the process with the technology," thereby enhancing the consumer experience. If companies merely roll out technology for the sake of having a product on the market, Wolkomir cautioned, "It just

becomes the next shiny new tool," possibly the biggest danger he sees in how companies rollout generative AI products.

RISKS OF AI

As the integration of AI technologies into real estate accelerates, the sector faces significant challenges related to privacy, ethical use, and the responsible handling of vast amounts of personal data. These concerns are not just operational but are tied to consumer trust and ethical standing. Panelists discussed the importance of maintaining rigorous standards to ensure that AI tools are used responsibly.

Zhu highlighted the complexities involved with the data used in mortgage lending decisions. "It's equally important to think about how to enhance the transparency and interpretability of those complex models and decision making," Zhu emphasized. She discussed the industry's swift adoption of AI and the need for caution, suggesting that the deployment of AI technology should be thoughtful and responsible.

Linda added to Zhu's perspective acknowledging, "This isn't a race," to first deployment of technology but "rather we want to do the right thing and be responsible." Linda noted Zillow will open source some of its modeling, a process which increases the transparency of its software design.

Zhu has focused her research on the biases present in automated valuation models (AVMs), which are extensively used in property valuations. Her findings indicate that current AVMs often produce larger valuation errors in predominantly Black neighborhoods compared to majority white counterparts. She explained that much of the existing data is rooted in long-standing racial disparities in property values, underlining the critical need for models that do not perpetuate these inequalities.

Her solutions advocate for a proactive approach in the development phase of AI models, urging creators to design algorithms that fairly utilize data while considering historically disadvantaged

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- Ondrej Linda**

populations. This involves adjusting for factors such as gentrification, natural disasters, and zoning reforms. Zhu also stressed the importance of regulatory oversight to ensure these ethical guardrails are effectively enforced.

Adding to the discourse on privacy, Artzi warned about the potential misuse of personal data input into AI systems. He advised that when users work with products where they input information, they should be cautious not to use personal details, as there is a risk of that information falling into the wrong hands. He pointed out that data used in training AI models could inadvertently be leaked or misused, even by well-intentioned firms.

Diez echoed these concerns, particularly with how LLMs (large language models) are trained on user-provided data. He noted the dual challenge of protecting this data from external misuse while also preventing internal biases from influencing the training process. Multiple panelists emphasized their organizations' commitment to navigating these challenges with a conscientious and ethical approach, ensuring AI's impact enhances rather than undermines the integrity of real estate practices.

“It’s equally important to think about how to enhance the transparency and interpretability of those complex models and decision making,”
- Linna Zhu

CONCLUSION

The panel’s exploration of AI in real estate culminated in a reflection on the technology’s real-world challenges and broad-ranging potential in its deployment. The considerations facing AI development and deployment are many: risk of bias, data privacy leaks, and unethical use.

Yet, the opportunities for technological adoption that benefit REALTORS® and society at large are vast. Whether it’s automating administrative tasks to focus on the human aspect of the job or utilizing AI to enhance the customer experience. A panelist even highlighted how this technology is being utilized to maximize parcels to boost housing supply. Artzi summarized a sentiment of uncertainty saying, “we don’t yet know how the

future is going to develop,” but we do know that change is inevitable due to this technological development. The delineation of tasks between machines and humans is yet to be determined.

Looking ahead, panelists affirmed the dynamic future of AI in real estate but with a human-centric approach. They emphasized there will continue to be an ongoing dialogue about harnessing AI’s capabilities responsibly, ensuring that its integration into real estate to enhance the profession and benefit consumers. Panelists harped on the promise of continued advancements and vigilance required to address challenges as the industry navigates this transformative journey.

MODERATOR:



Anna Tong
Technology Correspondent, Reuters

Anna Tong is a correspondent for Reuters based in San Francisco, where she reports on the technology industry. She joined Reuters in 2023 after working at the San Francisco Standard as a data editor. Tong previously worked at technology startups as a product manager and at Google where she worked in user insights and helped run a call center. Tong graduated from Harvard University.

PANELISTS:



Shay Artzi

SVP & Head of Engineering, Compass

Artzi and his teams are responsible for the technical design, architecture, delivery and maintenance of the Compass Platform, as well as the internal Security, Technical Infrastructure and Enterprise Technology. Shay began his compass journey in 2021 and brings 25 years of experience building software, leading engineering teams, and growing careers at companies such as Amazon and IBM. He has a PhD in computer science from MIT, is the author of dozens of scientific publications in academic journals and conferences and holds 14 U.S. patents.



Maximillian Diez

CEO, Twenty Five Ventures

Diez is CEO of Twenty Five Ventures, empowering proptech and fintech start-ups and serving as co-founder and General Partner of the 25V Series. With over two decades of experience in real estate and technology, he's adept at guiding startups to successful acquisitions, evidenced by his roles at Redfin, Movoto, and UpNest. Maximillian has been an experienced real estate broker in Hawaii and California since 2000. Elected to the University of San Francisco's Board of Trustees, his leadership extends to academia. Residing in the San Francisco Bay Area, he's a respected thought leader and writer in real estate tech, contributing to Forbes and shaping the industry's future.



Ondrej Linda

Director of Applied Science, Zillow

Metcalf leads the expansion and deepening of the Turner Center's work addressing housing affordability challenges through rigorous research and policy analysis. His previous roles include the Director of the California Department of Housing and Community Development and Deputy Assistant Secretary of the U.S. Department of Housing and Urban Development. His past responsibilities included oversight of the Federal Housing Administration multi-family guaranteed loan portfolio and a subsidized affordable housing portfolio. He has a Masters in Public Policy and Urban Planning from the Harvard Kennedy School.



Alex Wolkomir

Partner, McKinsey & Company

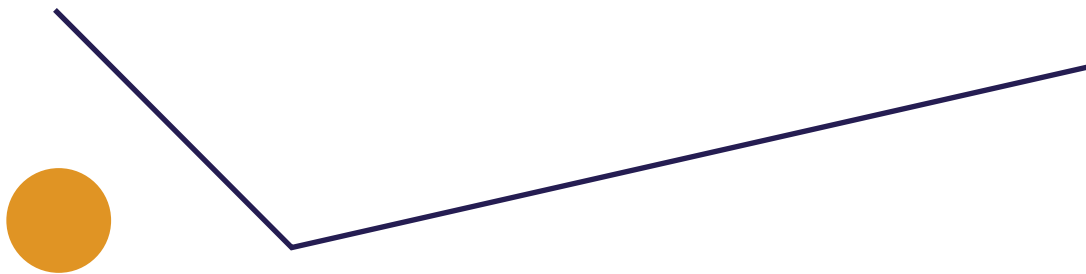
Wolkomir is a leader in McKinsey's Real Estate Practice, focused on using digital and analytics to create new products and operating models. He has led several large-scale digital transformations and digital product builds across asset classes, serving leading residential, office, industrial, retail, and hotel owners and operators. He has also helped technology players and service providers in the real estate industry use digital and analytics to transform their product offerings. Wolkomir is currently leading McKinsey's thinking related to Generative AI and its applications to real estate to create tangible business value. He holds a graduate degree in design and engineering from Stanford's d.school, where he also taught and researched.



Linna Zhu

Senior Research Associate, Housing Finance Policy Center, Urban Institute

Zhu's work at the Urban Institute's Housing Finance Policy Center examines housing and community development, with a focus on addressing racial inequality in the face of social changes and adverse shocks. Central to her current work is the question of how to ensure individuals and communities can equally adapt to technological advancements, such as artificial intelligence (AI). Dr. Zhu has published on such topics as algorithmic bias in automated valuation models (AVMs) and artificial intelligence in mortgage lending. Her research has been published in leading academic and policy journals and featured in national media coverage. Zhu holds a PhD in public policy and management from the University of Southern California.





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