SUPPLEMENT ON TECHNOLOGY AND REAL ESTATE: A SYNTHESIS

These slides provided by Norm Miller,
as a supplement for the Commercial
Real Estate Textbook 4th Ed

- ▣ PropTech Overview: New Efficiencies and Opportunities for the Commercial Real Estate Industry
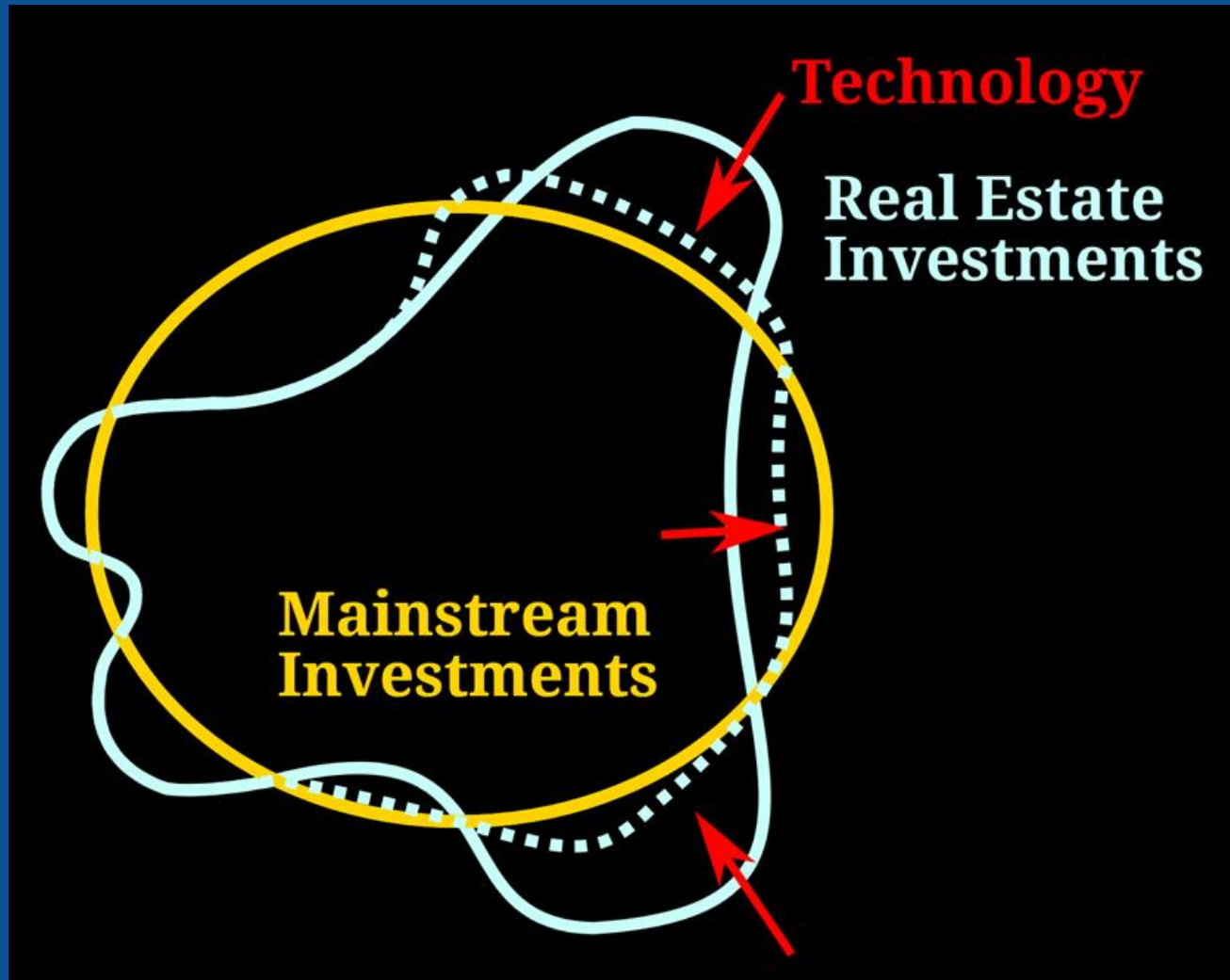
What is PropTech?

A name for any technology that aids real estate design, marketing, valuation, analytics, investment decisions, communicating, and reporting, security and access and building management systems, including all facilities, (i.e. HVAC, temperature controls, air quality), construction management, transaction management, and measures, automates and improves the speed and efficiency of these functions.
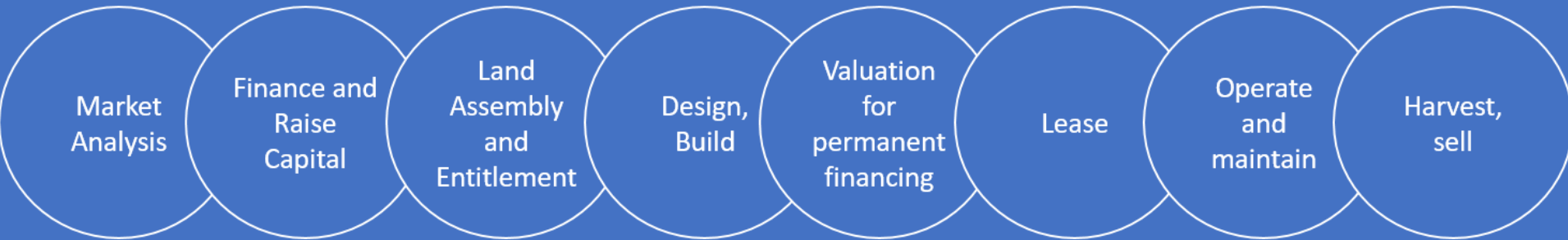
Many existing firms are "proptechs" but were never called as such: CoStar, MSCI, Compstak, Zillow, WeWork, AirBNB,VRBO, RealPage, Reonomy, as examples.

Note that we now also have Fintech and Climatetech playing off of the same concepts of reducing frictions and automating more processes.

Proptech Reduces Frictions, Speeds Up Communication and Decision Making

Another logical way to Categorize: Life Cycle of a Building

| Market Analysis | Finance and Raise Capital | Land Assembly and Entitlement | Design, Build | Valuation for permanent financing | Lease | Operate and maintain | Harvest, sell |

Data & Trends	Finance Debt and Equity	Brokers, Consultants & Development	Design, Contract	Value, Finance	Lease	Building Management Systems (BMS)	Brokerage
CoStar	CommLoan	Auction.com	Adobe	Altus	Yardi	Cohesion	BiProxi
CoreLogic	Peerstreet	BoomTown!	Autodesk	Black Knight	ARGUS	Appfolio	RealNex
VTS	REALInsight	RealNex, TenX	Inteliglas	GreenStreet	SpaceBase	RealPage	Loopnet, TenX
RealPage	RealtyMogul	Loopnet Apartments.com	Revit	REIS	FunnelLeasing	SMS Assist	Reonomy
Reonomy Compstak	Rooftstock	VTS	Autocad	REONOMY	MRI Prolease	Tridium (Connectivity)	VTS
RCA (MSCI)	Fundrise	BiProxi	Cadpro	CREDiQ	Tenantbase	VTS	CREXI
GreenStreet	Cadre	Zonda			SmartRent	Yardi	Knock

Another Proptech Categorization by Focus

Category	What do they do?
Facility and Building Management	Sensors measure, monitory, activate decisions, trigger automated responses and optimize energy, lighting and general environment for maximum productivity
Tenant Experience	Tenant amenities, requests, services, wellness.
Space Availability	Co-working, Co-living, flexible leases, subleases. Automated self leasing!
Appraisal	Automated valuation updates and reporting
Predictive Analysis	Machine learning systems applied to forecasting, building management or risk assessment. Automated reactions or red flags generated.
Productivity and Sales Tools	Automated communication and report generation pulling in analytics and providing contact management.
Online Transaction Management	Landlord reporting to tenants and investors, financing and closing docs as well as leasing all online. Might use **blockchain. Fundraising via Tokenization.**
Visualization Tools	Drones, virtual touring and design customization. User driven tours at leisure.
Construction Technology	Construction management, BIM, digital collaboration, inspections and monitoring.

All of these functions might be improved with proptech applications

- ✓ Design, Building Information Modeling (BIM) and Digital Twins
- ✓ Project Contracting and Management
- ✓ Property and Transaction Data and Analysis
- ✓ Financing Analysis, Sourcing and Support
- ✓ Equity Provision, Crowdfunding, Tokenization
- ✓ Financial Analysis and Valuation
- ✓ Brokerage and Leasing
- ✓ Development Support
- ✓ Marketing, Leasing and Sales
- ✓ Transaction and Title Management
- ✓ Occupancy management efficiency systems
- ✓ Building Management Systems and Operations
- ✓ Investor Reporting
- ✓ Energy Measurement, Management, and Wellness
- ✓ ESG (Environmental Social and Governance) Reporting
- ✓ Climate Risk Data and Analysis (Flood, Fire, Weather)

There are many startups and most will not make it.

- They must have enough capital to last until they reach profitability, something that can take up to ten years in a conservative industry.

- They must have some expertise in real estate, not just great programmers with an idea.   That is, an all real estate expertise team or all tech programmer type team will not succeed.

- They must have an application that integrates with other widely used applications like building management systems, i.e. like Yardi, MRI.

- They must realize that acquiring and filtering data is not easy, and few industry participants want to use multiple vendors, so widespread market coverage is essential.

- Last, they must beat out most of the other vendors, with similar applications as the market has no need for more than a handful of similar vendors.   80% of start ups will fail. The others will change the industry.

Some Examples of Propetch: Design, Construction and the Metaverse

- ▣ BIM, building information modeling replaced the old physical models with a digital twin and allowed for integration of all systems (Structure, plumbing, electric, HVAC, sensors and more)
- ▣ Examples
  - ▪ Autodesk (Revit) www.autodesk.com
  - ▪ Oracle Aconex Aconex - Construction Project Controls Software | Oracle
  - ▪ Archicad Graphisoft Archicad – Graphisoft
  - ▪ Procore Procore | Construction Management Software
  - ▪ Houzz Pro Houzz Pro: All-In-One Business Software for Contractors & Design Pros | Houzz
- ▣ We also use proptechs to provide virtual tours of space not yet finished or not easily accessible, and these tours can also show what any configuration of lighting or furnishing will look like. AR = Augmented Reality
- ▣ See for example: Vera, or RealPix

Another example: SmartRent:
an enabler of SFR becoming a new asset class

https://smartrent.com/

Self-guided tours available. Self leasing. Tenant controls (Access, HVAC, Internet, Lights)

Parking management and access control.

"Our platform enables you to control all of the smart devices in your properties. Property managers can monitor all vacant unit activity and remotely control door locks, thermostats, lights and hundreds of other smart devices."

When a unit is filled, the residents can seamlessly control their smart devices through our app, giving them an unparalleled resident experience.

Some Data and Analysis Proptechs

▣ Moody's Analytics | Global Economic Analysis, Data, Forecasts and Scenarios. (economy.com) Economic data

▣ CoStar | # 1 Commercial Real Estate Information Company: Transaction data, lease data, photos, maps, analytics

▣ Real Capital Analytics – MSCI: Transaction data for CRE.

▣ CoreLogic® - Property Data Leader & Property Solutions

▣ Black Knight, Inc. | Comprehensive Technology, Data and Analytics (blackknightinc.com)

▣ About Us | ICE: Property transaction and mortgage data

▣ Jupiter Intelligence : Climate risk data

▣ First Street: Climate risk data

An Easy Great Application to Save Energy: Turn things off and analyze demand times

- ▣ Example: Escalators in China have sensors so when no one is on them, they turn off. When someone approaches they turn on.

- ▣ Example: Adobe found that when no cars or people were moving in underground garages they could turn off ventilation fans and saves hundreds of thousands of dollars.

- ▣ Example: Elevators used to be stationed on bottom, middle and upper floors but software that monitored demand by the minute over several months fine tuned the best place for each elevator to be for reduced waiting and transit time.

- ▣ In all cases, proptechs with sensors could do these tasks.

Some ESG reporting Firms

- ▣ [Measurabl](#)
- ▣ [Verdani](#)

Measurabl examples

https://www.measurabl.com/resources/nuveen-optimizes-building-performance-with-fast-payback-thanks-to-measurabl/

https://www.measurabl.com/resources/rubenstein-partners-improves-portfolio-value-with-measurabl/

https://www.measurabl.com/resources/bxp-uses-measurabl-to-support-the-execution-of-industry-leading-esg-strategy/

RealNex and PIX examples

https://realnex.com/Home/Product

Click on RealNex Navigator "Watch Video"

https://realnex.com/Home/Vr

Tokenization via Solid Block Proptech Example

Takeaways

1) Automated buildings that are more efficient, safer, healthier and touchless are the future.

2) Drones, cell phone tracking, foot traffic, visual images, VR, facial recognition and expert systems can improve actionable decisions on such processes as marketing, occupant productivity, security, realistic trade areas, or internal energy optimization.

3) Automating reporting and reducing needless paperwork by sharing and using the cloud more effectively is a large part of the story.

4) There are **too many firms out there as of 2025** trying to help the digitization and automation of CRE from leasing to access control to facilities management.

5) Disruptions will occur for professionals. The key is being up to speed on proptech possibilities and open minded.