Proptech
(Real-estech)

– 부동산 산업의 미래

Proptech(프롭테크)

부동산에 대한 기술적 디지털 혁명

technological and digital innovations relating to property

우리는 2년뒤에 바뀔 일들에 대해 과대 평가하나, 10년뒤에 일어날 일들에 대해서는 너무 과소평가 하는 경우가 많다.

We always OVERestimate the change that will occur in the next 2 years and UNDERestimate the change that will occur in the next 10

프롭테크의 영역

Investment & Financing — 투자 및 자금조달

Project Development — 프로젝트 개발

Property Management — 부동산 관리

Brokerage & Leasing — 중개·임대

프롭테크의 영역

- **(투자 및 자금조달)**
- 핀테크 기술이 부동산 시장에 도입된 것으로 크라우드 펀딩과 개인 금융 분야로 구성(예 : Realty Mogul)

- **(프로젝트 개발)**
- 부동산 개발과 관련된 프롭테크 영역으로 건설, 인테리어 디자인, VR/3D 분야 등이 해당(예 : Matterport, Eyespy360)
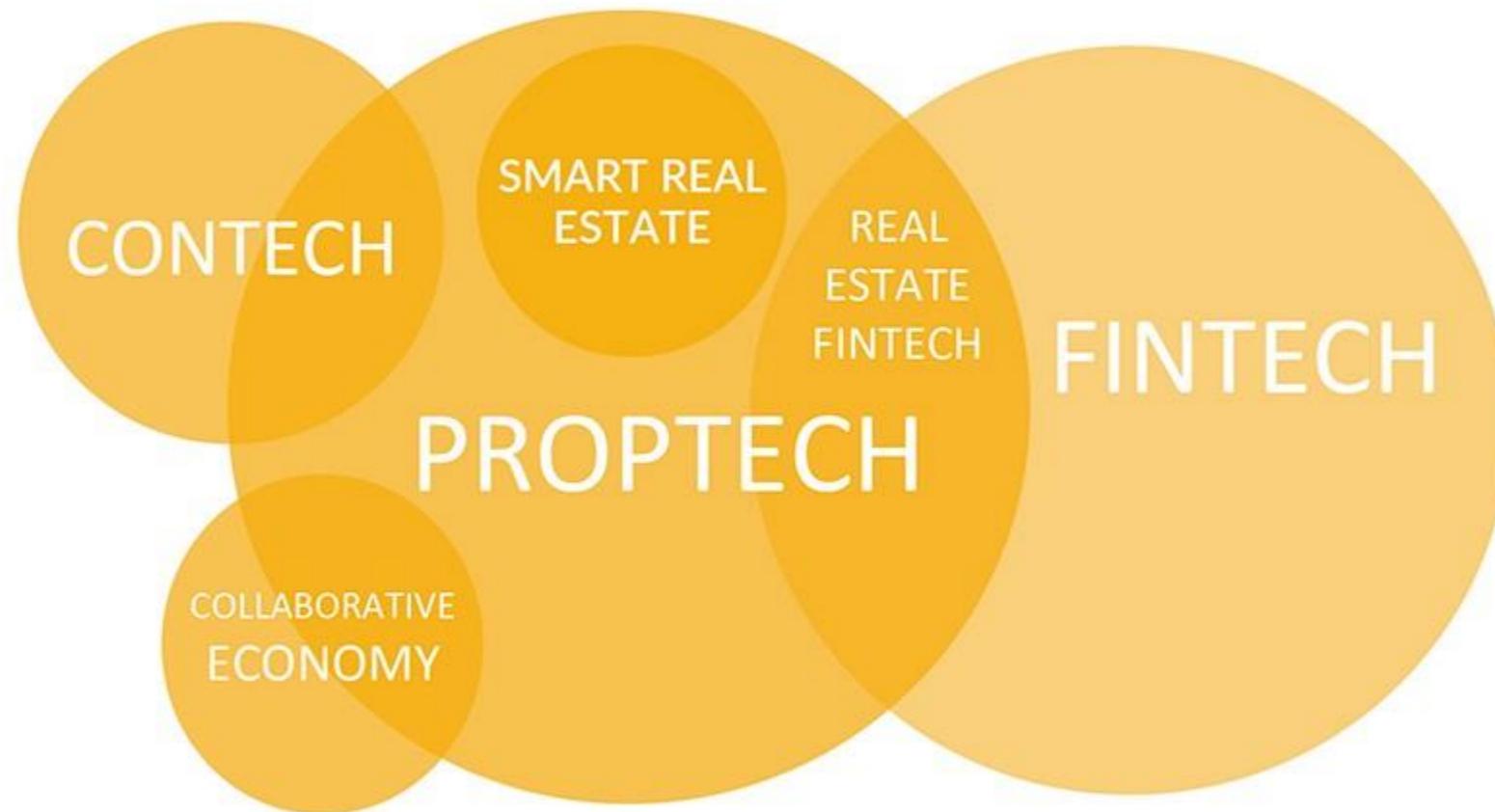
- **(부동산 관리)**
- 에너지, 사물인터넷(IoT), 센서 기술 등 스마트 부동산 기술을 기반으로 한 임차인, 건물 관리 서비스(예 : Hive)

- **(중개 및 임대)**
- 부동산 정보를 기반으로 개별 부동산에 대해 물건정보 등재에서부터 데이터 분석, 자문, 중개, 광고 및 마케팅에 이르는 매매·임대 정보를 제공(예 : Zillow, Realtor, Redfin)
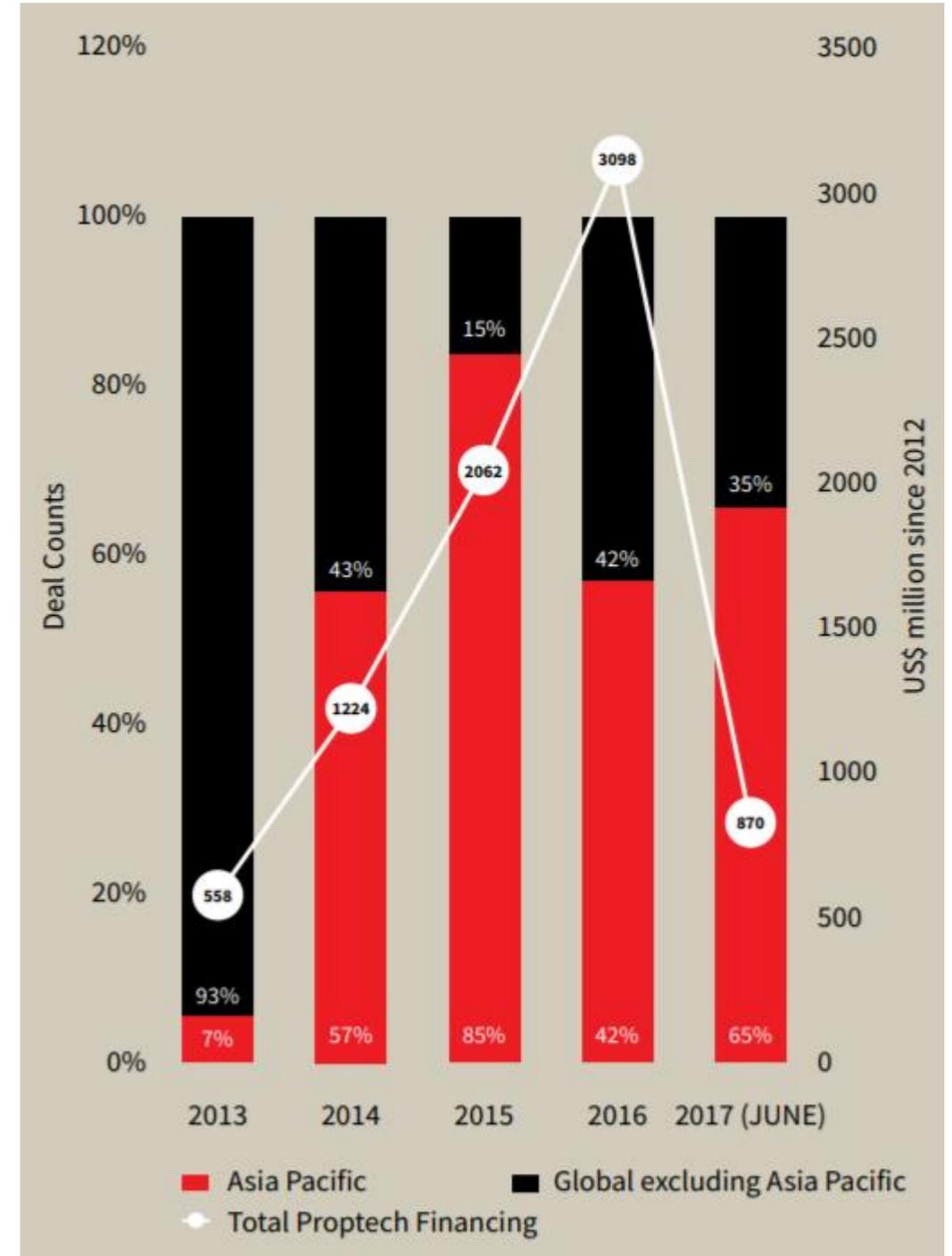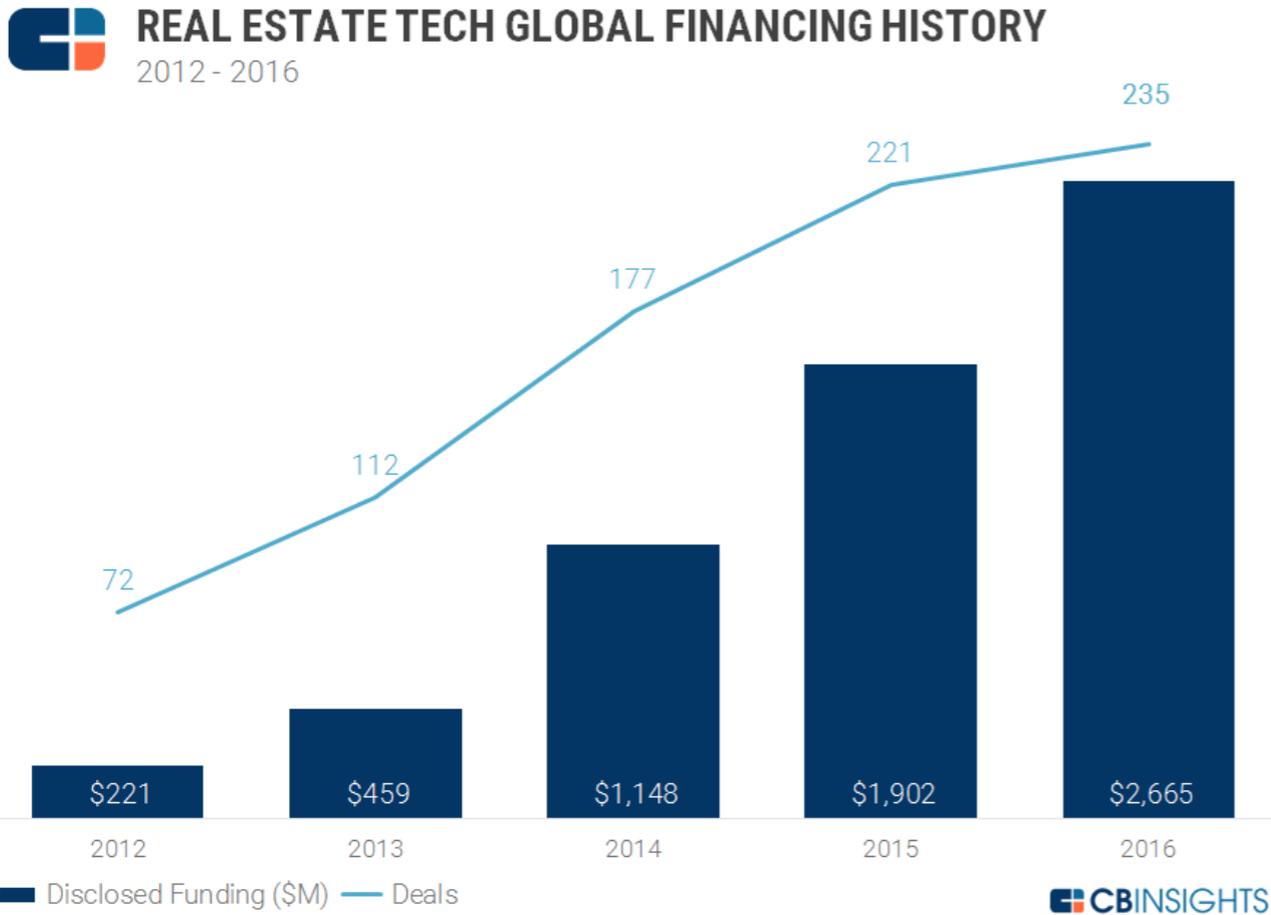
프롭테크의 영역

프롭테크의 영역

The Real Estate Tech Market Map

프롭테크 회사들의 펀딩

REAL ESTATE TECH GLOBAL FINANCING HISTORY
2012 - 2016

Proptech unicorns

| Company	Country	Description
WeWork	US	WeWork provides shared workspaces, technology startup subculture communities, and services for entrepreneurs, freelances, startups, small businesses and large enterprises
Airbnb	US	Airbnb is a community marketplace for people to list, discover and book spaces around the world through mobile phones or the internet
Lianjia	China	Lianjia is an O2O real estate agency service provider
Houzz	US	Houzz is platform for home remodeling and design, providing people with everything they need to improve their homes from start to finish
Mofang	China	Mofang is one of the largest institutional rental apartment companies in China
OpenDoor	US	Opendoor is an online homeselling service aimes at streamilining the sales process down to a few days
PropertyGuru	Singapore	Singapore's largest property classifieds portal
LendingHome	US	A technology-enabled marketplace that brings together borrowers and investors to improve the mortgage process

미국 프롭테크

영국 프롭테크

PropTech UK Map
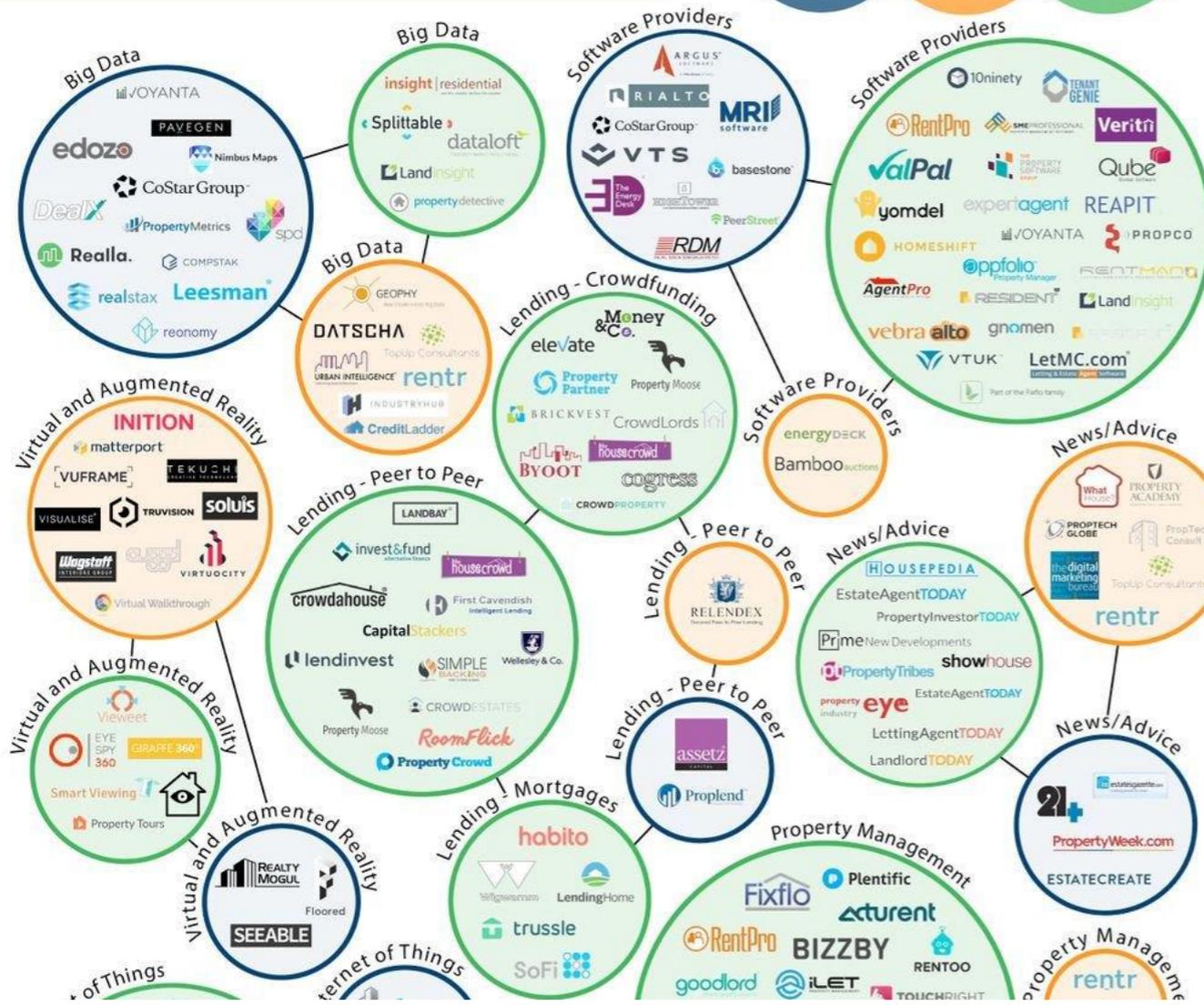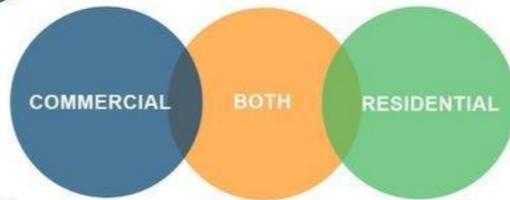
비즈니스 유형	Residential	Commercial
Software Providers	51	26
Property management	27	10
Online Agents - Sales	32	0
BigData	17	23
Online Agents - Lettings	25	0
News/Advice	21	15
Virtual Augmented	19	16
Internet of Things	10	5
Online Agents - Brokerage	14	2

독일 프롭테크

Proptech in Spain

Proptech companies

빅데이터를 통해, 저평가된 집을 사고 파는 서비스

Proptech companies

부동산에 대한 P2P 대출

Proptech companies

온라인 분양 정보

Proptech companies

단기 임대 및 주거 관련 서비스

Proptech companies

주거 관련 IOT

Proptech companies

공유 오피스 (하드웨어)

Proptech companies
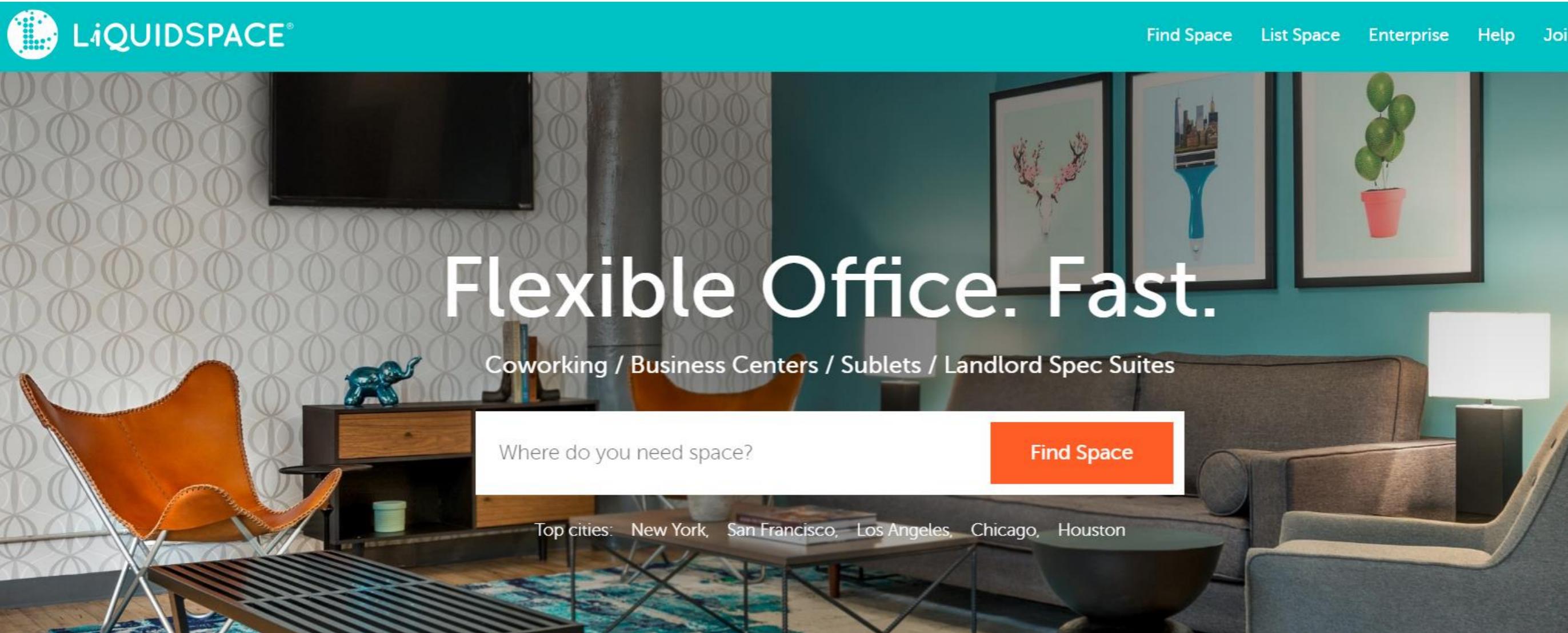
공유 오피스 플랫폼

Proptech companies

인테리어

Proptech companies

상업용 부동산 관리

Proptech companies

부동산 크라우드 펀딩
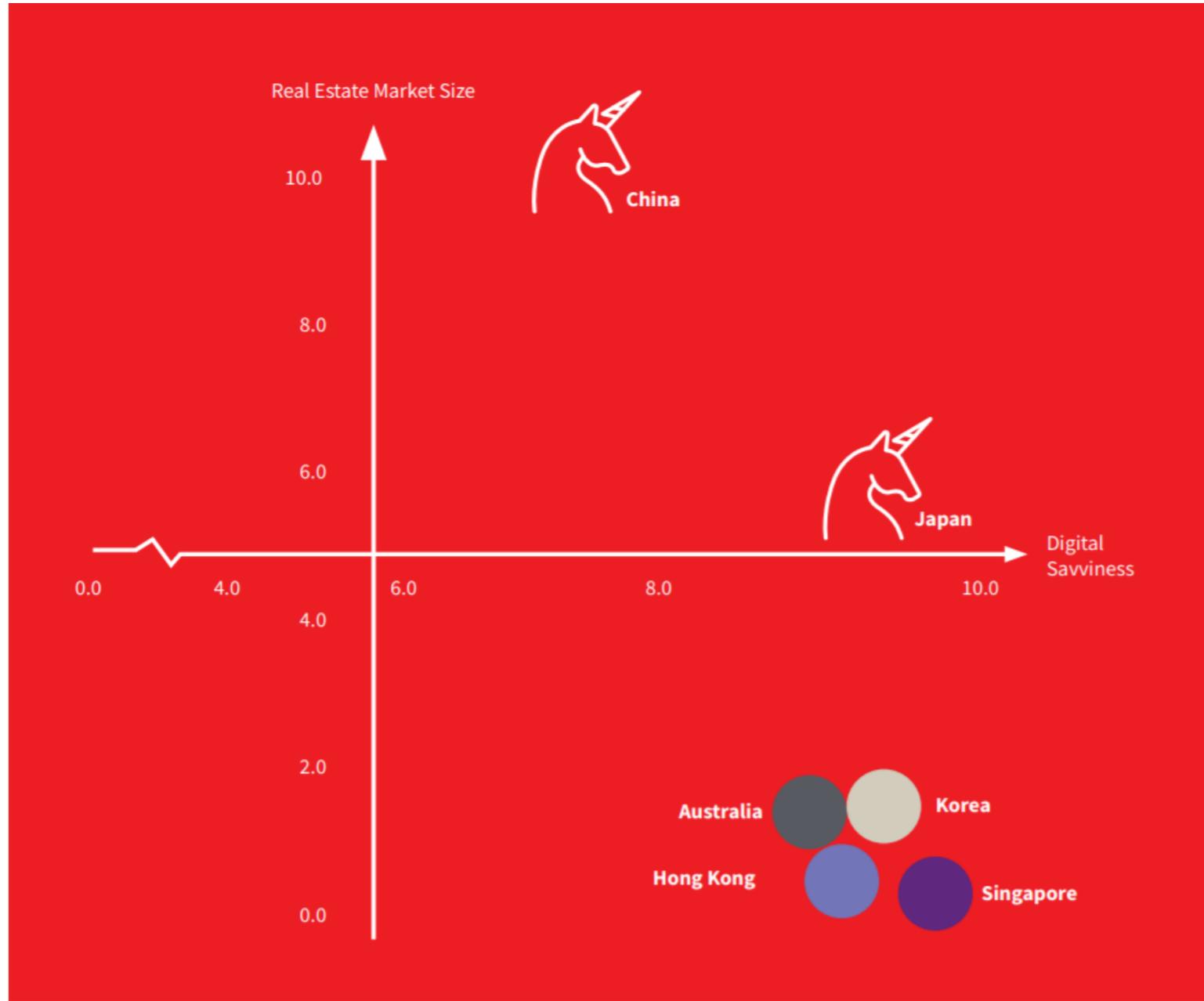
아시아퍼시픽 프롭테크

아시아퍼시픽 프롭테크

– Evolution trends

Proptech 1.0
- Low technical challenge
- Consumer focus
- Aggregators / marketplaces

PROPTIGER

LIANJIA.com

CO Assets™

LIVSPACE
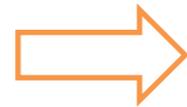
Proptech 2.0
- Medium technical challenge
- Small business focus
- Existing technology

PropKaro
THE PROPERTY DALAL STREET

51 VR

PROPSTACK

followit

Proptech 3.0
- High technical challenge
- Enterprise focus
- Emerging technology

HIVE UAV

SenseHawk

QwikSpec

Seeder

아시아퍼시픽 프롭테크
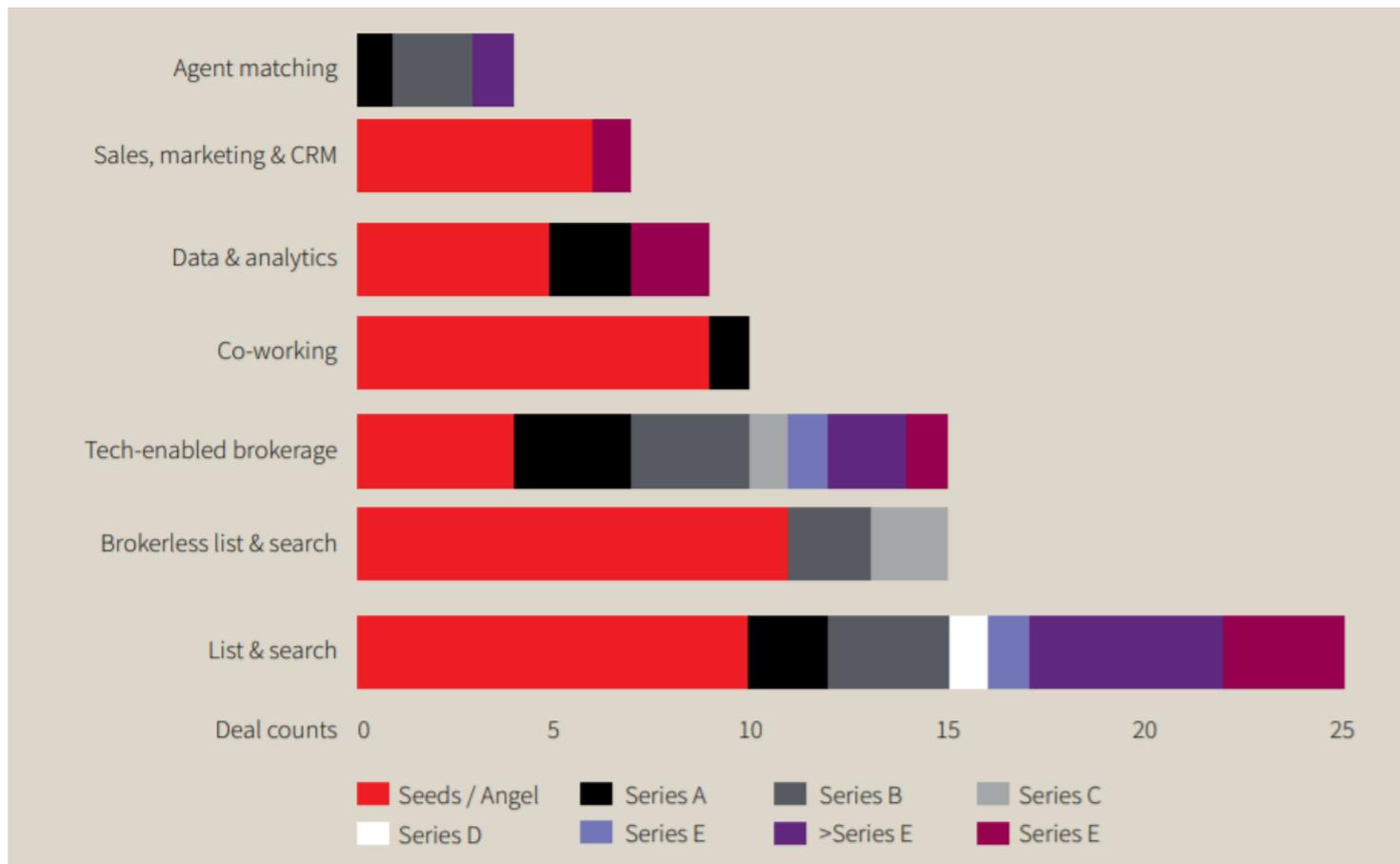
List and search

List and search portals, such as PropertyGuru of Singapore, are the most common types of start-ups. They are effectively an online classifieds platform combining search engines with brokers' listings. To commoditise and standardise the offerings, some start-ups like China's Mofang are going the extra mile to own and design the apartments being offered.

Tech-enabled brokerage

Eschewing the use of offline channels, tech-enabled brokerages use online platforms to connect their brokers with clients via internet platforms. Some tech-enabled brokerages like PropTiger even allow property developers to sell new inventory directly to home buyers. They also provide sales, marketing, and CRM tools to brokers.

Brokerless list and search

Taking a leaf out of AirBnb's book, brokerless list and search start-ups seek to connect property owners with buyers or tenants, thus replacing the broker as the intermediary of choice.

Agent matching

Agent-matching platforms use a combination of user social data and agent reviews to match home buyers with the agents that suit them best.

Co-working

Taking advantage of the growing number of start-ups and high rental costs, co-working start-ups are disrupting the property cycle by offering shared spaces, facilities and add-on supporting services to other start-ups, freelancers and, increasingly, more established companies. Compared with start-ups in other verticals, co-working start-ups do not possess unique tech capabilities; however, as they use technology to meet users' real estate demands – namely the need for affordable workplaces for individuals or small groups of people – co-working start-ups can still be considered proptech. Co-working start-ups offer easy access to space and flexibility with IT support for tenants such as a mobile app for booking or events registration. To attract tenants, most co-working operators market themselves as communities that bring together start-ups and potential clients or investors.

Data and analytics
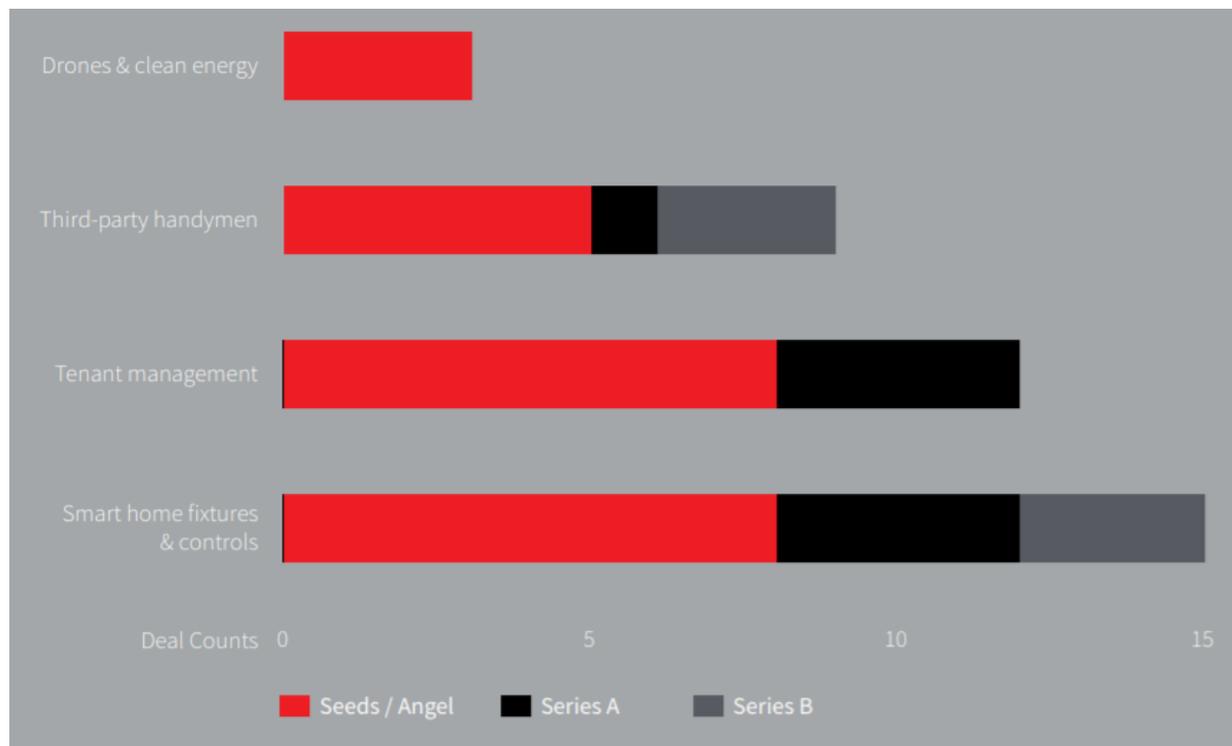
Initially beginning as a service that provided property buyers with the latest information and accurate valuations, data and analytics start-ups have begun providing enterprise clients with independent property data and reports.

Sales, marketing and CRM

Start-ups that provide marketing, lead generation, CRM and networking tools to property professionals.

Brokerage and leasing

아시아퍼시픽 프롭테크

Drones and clean energy
Third-party handymen
Tenant management
Smart home fixtures & controls

Deal Counts 0   5   10   15

■ Seeds / Angel   ■ Series A   ■ Series B

Drones and solar energy

Thanks to their added value for real estate developers, agents and tenants, the use of drones and solar energy in the industry is getting increasingly popular. Drones provide the means for both marketing properties and remotely conducting building inspections, while solar energy has evolved beyond merely powering homes to become a source of income through the sale of surplus energy.

Smart home fixtures and controls

Tapping into the prevalence of WiFi, smart devices are part of the Internet of Things universe and are used to connect and control disparate parts of the property.

Tenant management

The advent of cloud computing and Internet of Things (IoT) devices has enabled lease management start-ups to keep up-to-date records of tenants, maintenance tickets and space utilisation. In addition, lease management software is now available to help asset managers find and track tenants for their properties.

Third-party handymen

An avenue for property managers and homeowners alike to find reputable handymen for property maintenance.

Project management

아시아퍼시픽 프롭테크

Architecture and construction tools

Focused on removing pain points during the design and construction stages, start-ups in this vertical use cloud technology to digitise records and build a touchstone for architects and engineers.
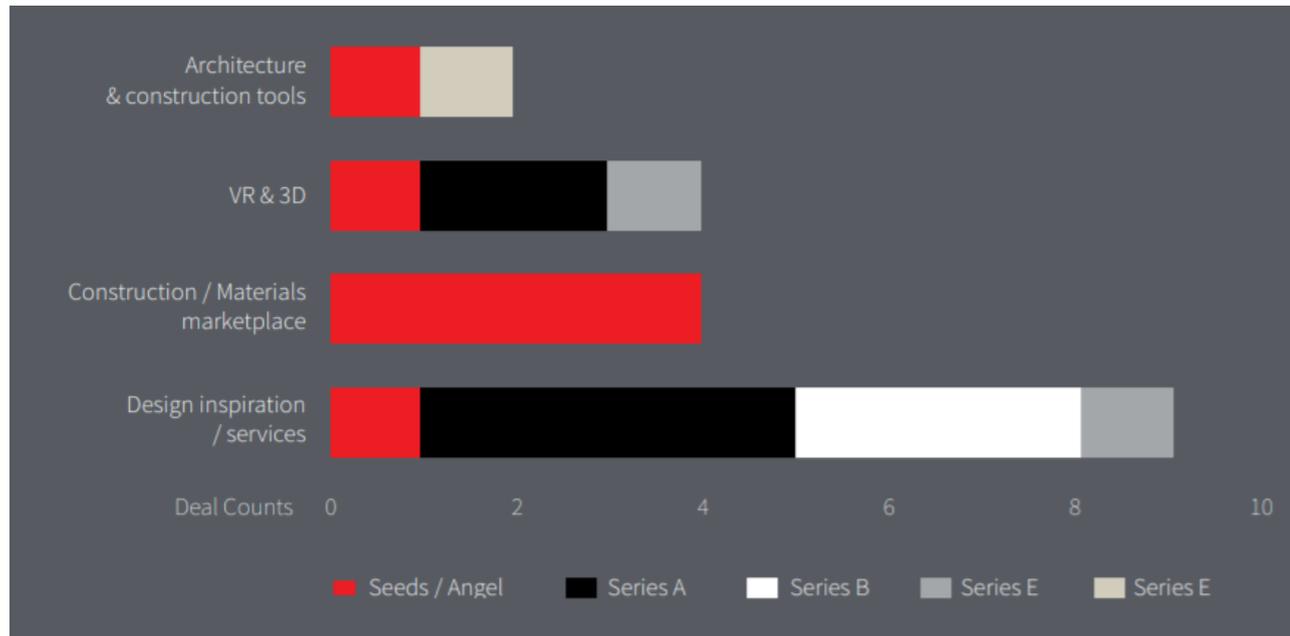
Construction/Materials marketplace

Like list-and-search start-ups, this vertical brings together contractors and suppliers to potential customers. For example, Revolution Precrafted strengthens this approach by using advanced modular tech and robotics to create homes within 90 days of a designer being chosen by the customer.

Design inspiration/services

See it, like it, buy it. Unlike Pinterest where users post designs that inspire others, most design inspiration/services start-ups use design inspiration as a means of compelling customers to buy their products. Many of these start-ups allow customers to upload their floorplans and receive customised design plans.

VR and 3D

Intended for architects, brokers and buyers alike to better visualise a property, VR and 3D are technologies used to provide a hassle-free viewing experience and reduce design mistakes.

Property development

아시아퍼시픽 프롭테크

Crowdfunding

Like Kickstarter for property developments, these platforms present would-be investors with lower barriers to entry due to the smaller amounts accepted, while enabling property developers an alternative means of fundraising.

Personal loans

Instalment payment platforms for housing rent and mortgages could potentially act as a form of securitisation. Fintech start-ups are trying to take on the burden of payments in exchange for monthly instalments from users.
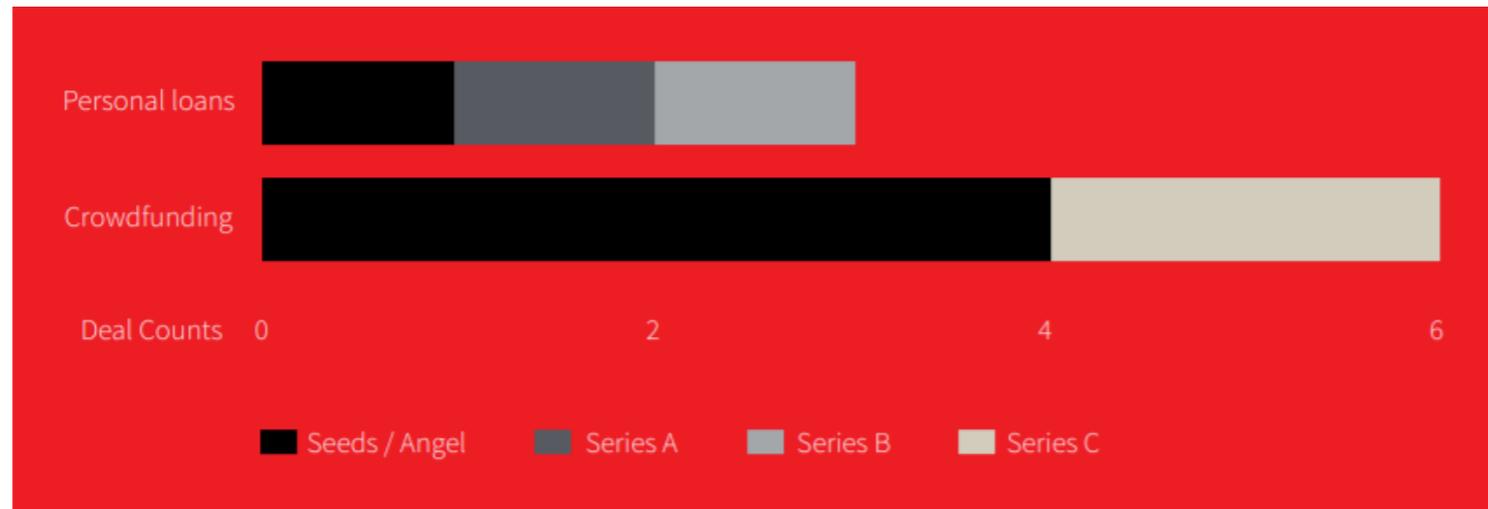
Investment and financing

프롭테크 기업으로서의 직방

Rent

Home owener

Developer

직방

아파트는 호갱노노

DaUm KAKAO

cupix   disco

Loft pmc

1,000만 유저 profile

부동산 가치 평가

실거래가 시세를 이용해서

머신러닝으로

학습을 시켜보면 어떨까 ?

부동산 가치 평가

- 머신러닝이란 **?**

  문제 해결을 위해 맞춤 코드 **(custom code)**를 작성하지 않고도 일련의 데이터에 대해 그 결과를 알려주는 일반 알고리즘 **(generic algorithm)**이 있다는 생각에서 출발
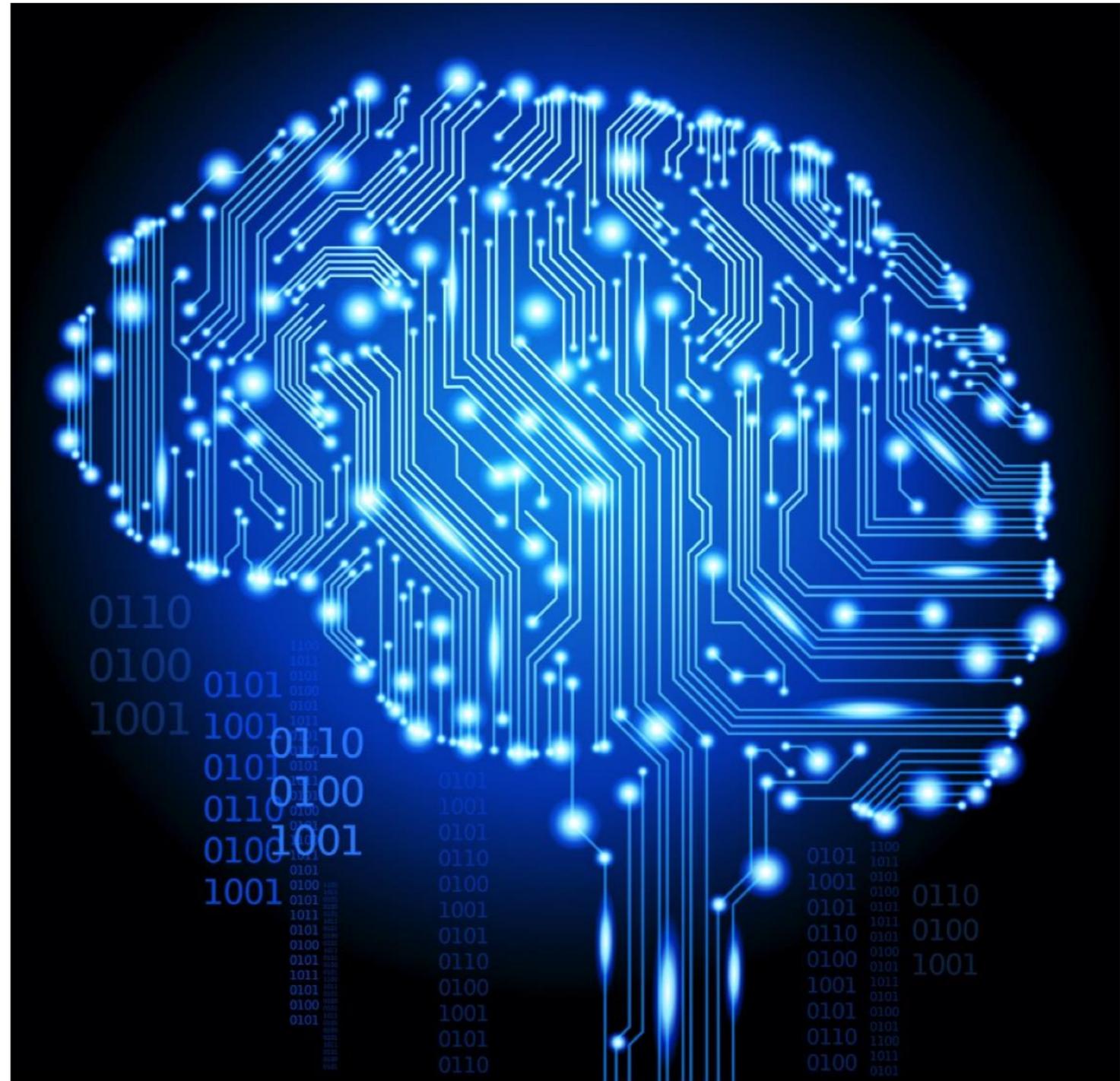
문제1	+	정답1
문제2	+	정답2
문제3	+	정답3

학습 **(train)**

| 문제4 |
| 문제5 |
| 문제6 |

예측 **(predict)**

| 정답4 |
| 정답5 |
| 정답6 |
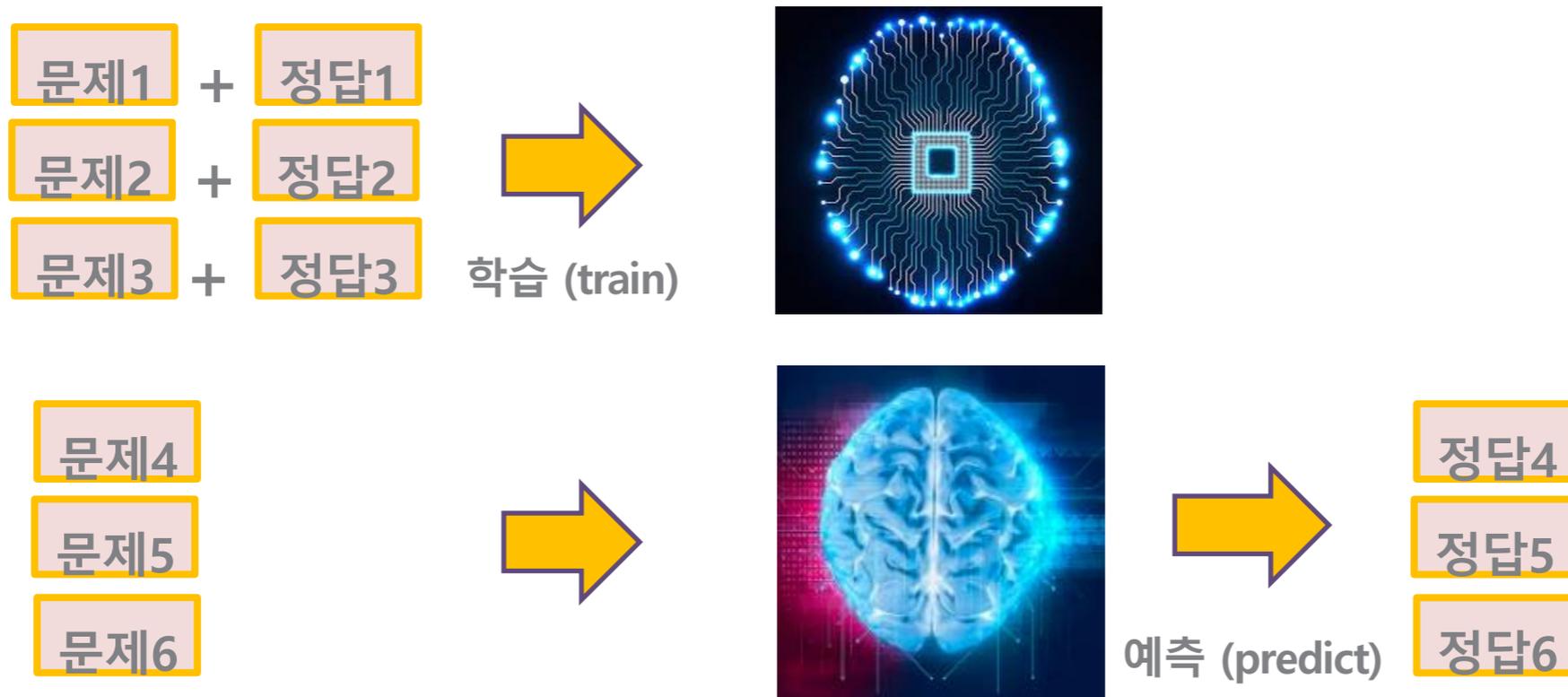
부동산 가치 평가

- 생성일
- 아파트 정보
  - 위경도 위치
  - 행정구역 (local2, local3)
  - 총세대수
  - 총동수
  - 최저/최고층
  - 주상복합 / 아파트 구분
  - 가구당주차대수
  - 준공년월
  - 현관구조
  - 난방방식
  - 부대시설
  - 초등학교 500m 이내
- 룸타입 정보
  - 공급면적, 전용면적
  - 방수, 욕실수
  - 테라스/복층 여부

문제1 + 시세1
문제2 + 시세2
문제3 + 시세3   학습 (train)

예측 (predict)

시세4
시세5
시세6

21,572,183건
(과거시세 36,896,005건 중 실거래가가 있는 경우)

15,323,822 건

문제4
문제5
문제6

수원한일타운 – 109타입

남산타운 – 139타입
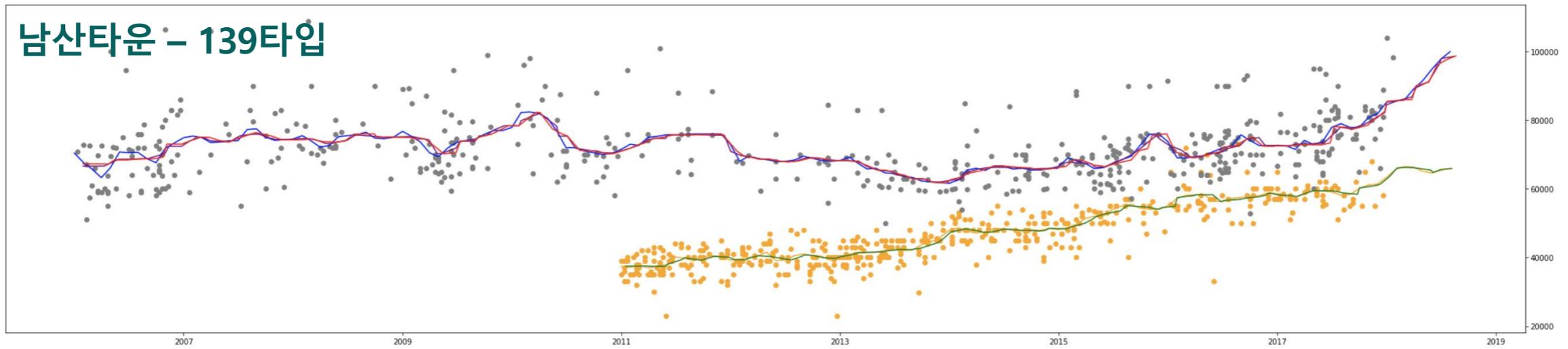
진흥 – 143타입

부동산 가치 평가

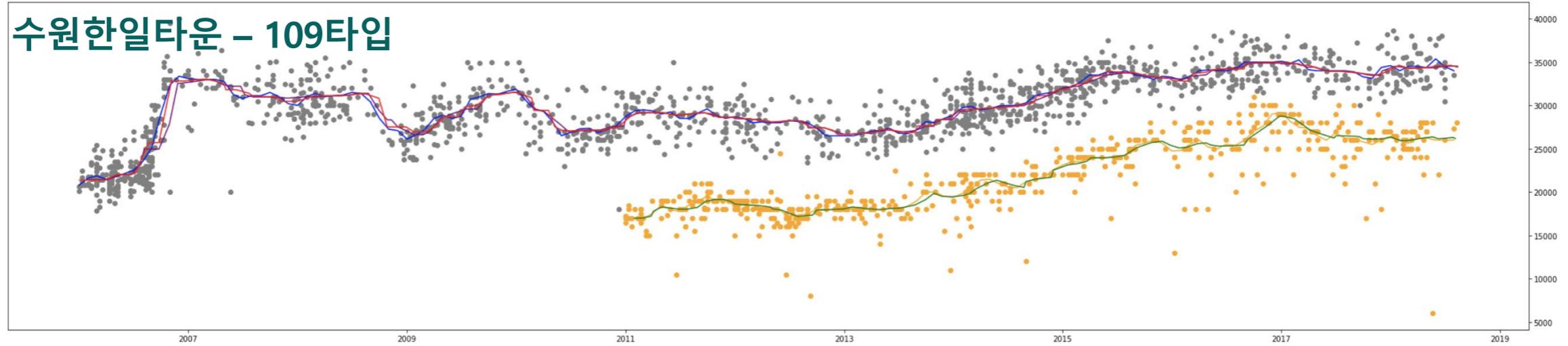- 신뢰성 평가 : MdAPE

해당 시점에서 머신러닝으로 예측한 가격과 사후

일어나는 실거래 가격의 차이를 환산하여 신뢰성 검토

Mean Absolute Percentage Error (MAPE)

$$MAPE = \frac{1}{n}\sum_{t=1}^{n}\left|\frac{A_t - F_t}{A_t}\right|$$

직방 시세™ ⑦

매매 6억5,500
(신뢰도 96.2%)

전세 4억8,000
(신뢰도 98.1%)

- 구축 아파트 가격 분석
- 분양가 예측
- 연립주택 / 토지 등의 영역으로 확대
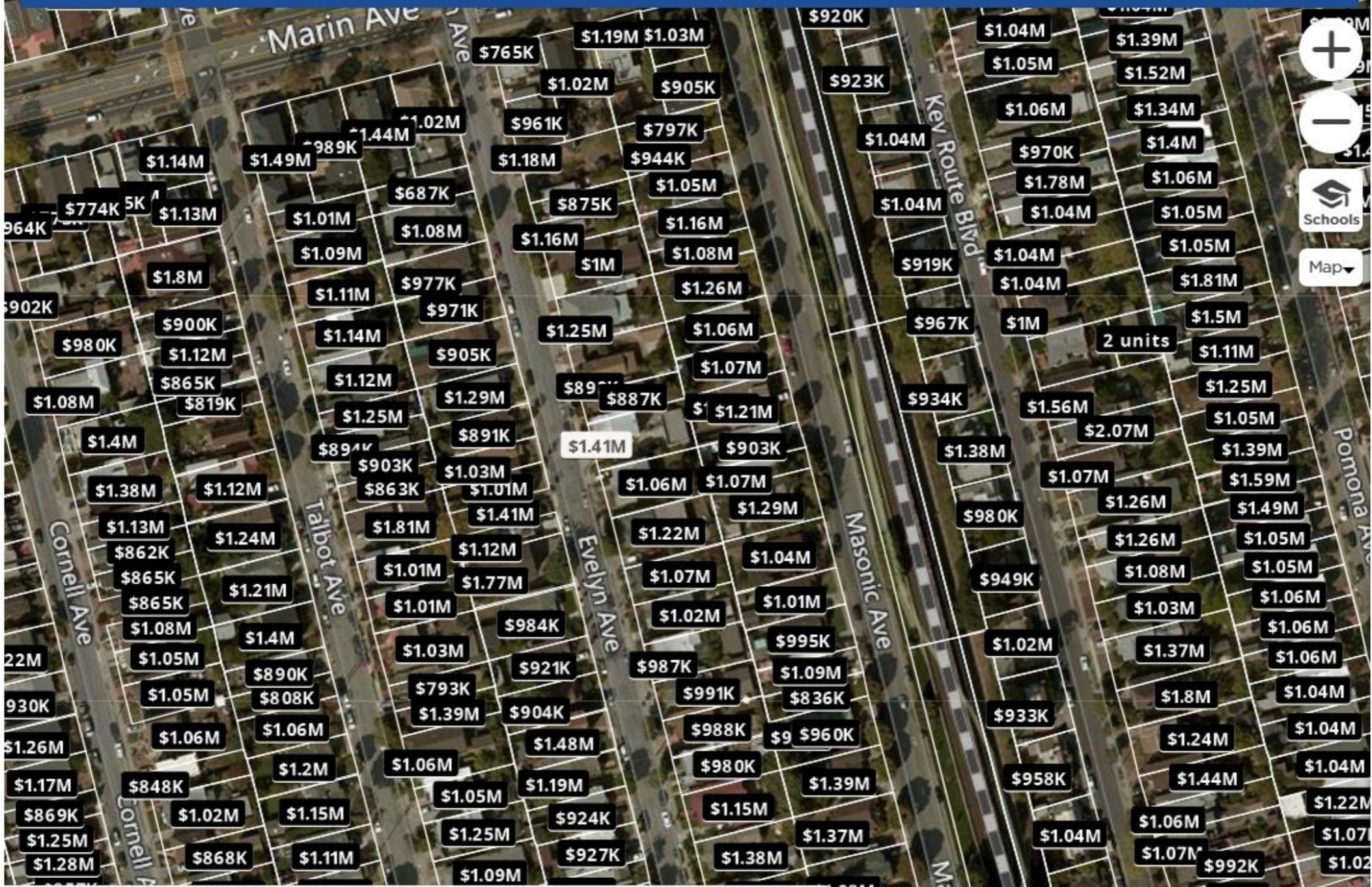
아파트 단지 조회 관련도

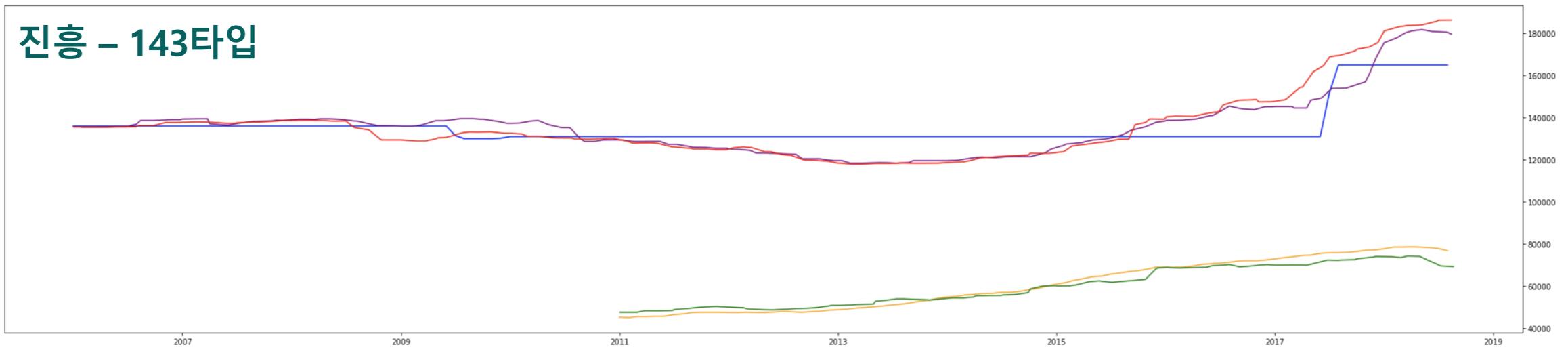| name	local1	local2	local3	Index	area_danji_i...	name (area_danji1)	거리계산	local1 (area_...	local2 (area_...	local3 (area_...	
16884, 반포자이	서울특별시	서초구	반포동	1	34306	아크로리버파크	1,999	서울특별시	서초구	반포동	17%
				2	22870	방배롯데캐슬아르떼	3,839	서울특별시	서초구	방배동	12%
				3	20568	용산더프라임	5,516	서울특별시	용산구	원효로1가	11%
				4	17239	삼성힐스테이트1단지	3,084	서울특별시	강남구	삼성동	9%
				5	18180	방배서리풀e-편한세상	2,962	서울특별시	서초구	방배동	9%
				6	19894	청담자이	4,118	서울특별시	강남구	청담동	9%
				7	20037	반포리체	387	서울특별시	서초구	반포동	9%
				8	2930	동아	533	서울특별시	서초구	잠원동	8%
				9	17240	삼성힐스테이트2단지	3,260	서울특별시	강남구	삼성동	8%
				10	17303	래미안퍼스티지	1,369	서울특별시	서초구	반포동	8%
16156, 리센츠	서울특별시	송파구	잠실동	1	16629	파크리오	1,788	서울특별시	송파구	신천동	23%
				2	15984	잠실엘스	614	서울특별시	송파구	잠실동	15%
				3	4027	호수임광	1,674	서울특별시	송파구	송파동	10%
				4	3943	잠실한솔	1,755	서울특별시	송파구	석촌동	9%
				5	10591	레이크팰리스	646	서울특별시	송파구	잠실동	9%
				6	1397	현대	1,013	서울특별시	송파구	잠실동	7%
				7	14453	트리지움	396	서울특별시	송파구	잠실동	7%
				8	20761	잠실푸르지오월드마크	1,435	서울특별시	송파구	신천동	7%
				9	249	대치2단지	2,371	서울특별시	강남구	개포동	7%
				10	6232	갤러리아팰리스	519	서울특별시	송파구	잠실동	7%
33613, 센트라스	서울특별시	성동구	하왕십리동	1	33272	왕십리KCC스위첸	594	서울특별시	성동구	하왕십리동	12%
				2	17838	롯데캐슬베네치아	835	서울특별시	중구	황학동	11%
				3	24894	왕십리뉴타운1구역텐즈힐	322	서울특별시	성동구	하왕십리동	11%
				4	33342	신금호파크자이	1,448	서울특별시	성동구	금호동2가	11%
				5	22637	텐즈힐	602	서울특별시	성동구	상왕십리동	10%
				6	19582	서울숲힐스테이트	3,452	서울특별시	성동구	성수동2가	10%
				7	1349	행당한진타운	1,127	서울특별시	성동구	행당동	9%
				8	19892	신당래미안하이베르	747	서울특별시	중구	신당동	9%
				9	3730	한진그랑빌	357	서울특별시	성동구	하왕십리동	8%
				10	21793	서울숲더샵(아파트)	1,411	서울특별시	성동구	행당동	8%

부동산 가치 평가

- **Learning Model**

  사람의 뇌에 해당하는 것으로, 문제를 해결하는 방법(알고리즘)의 정의

- 실험에 사용한 장비 : c5.18xlarge

- cpu: **72** ea x **3 GHz** / mem: **144 GB**

CPU 72개가 들어간 컴퓨터 10대를 지속적으로 돌리며 모델링을
업그레이드

The future of PropTech (London)

IT / property management / developers / data handlers / design tools
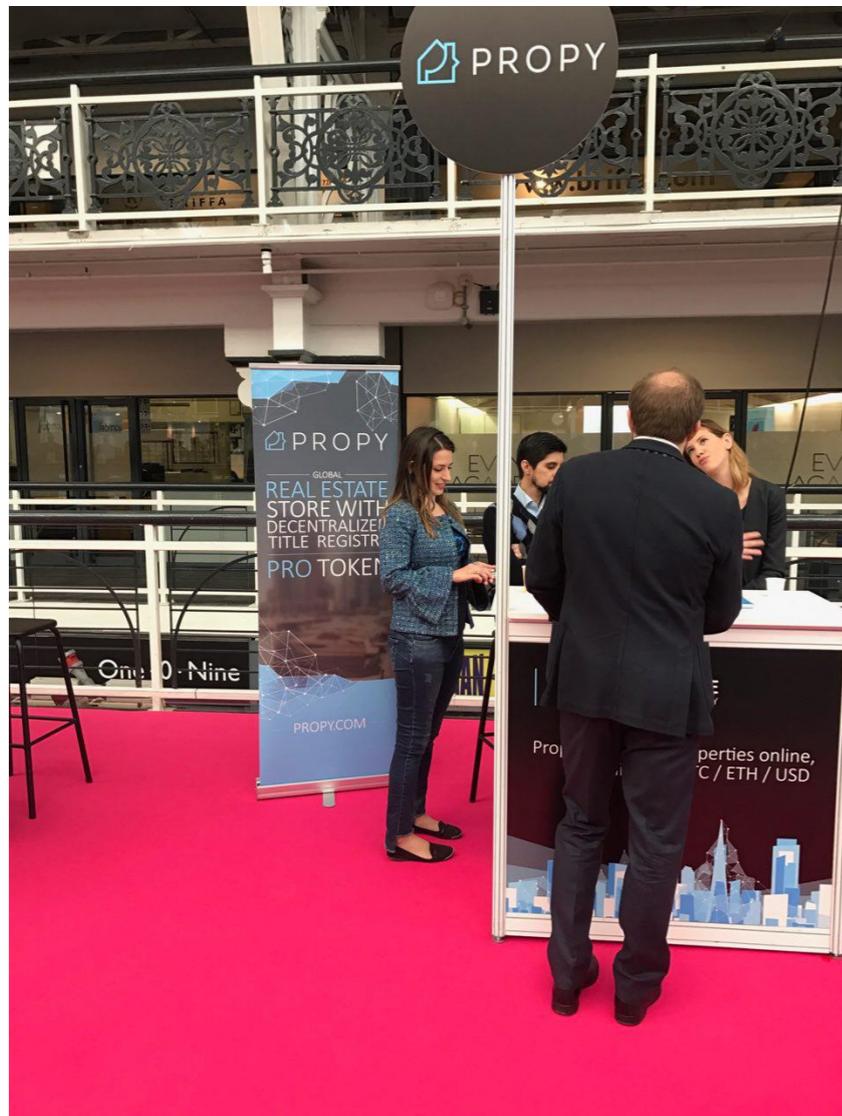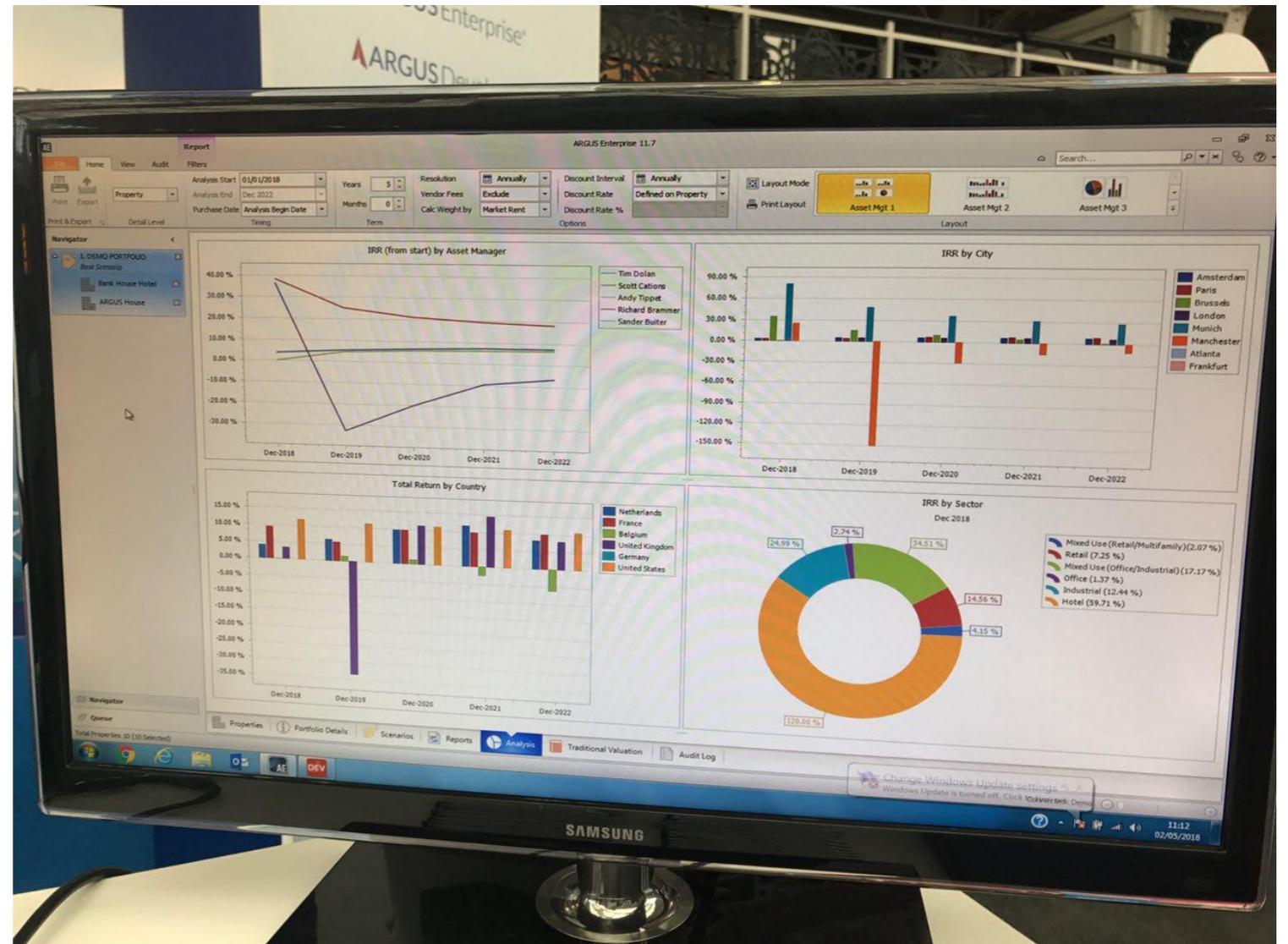
VR

Eyespy360

matterport

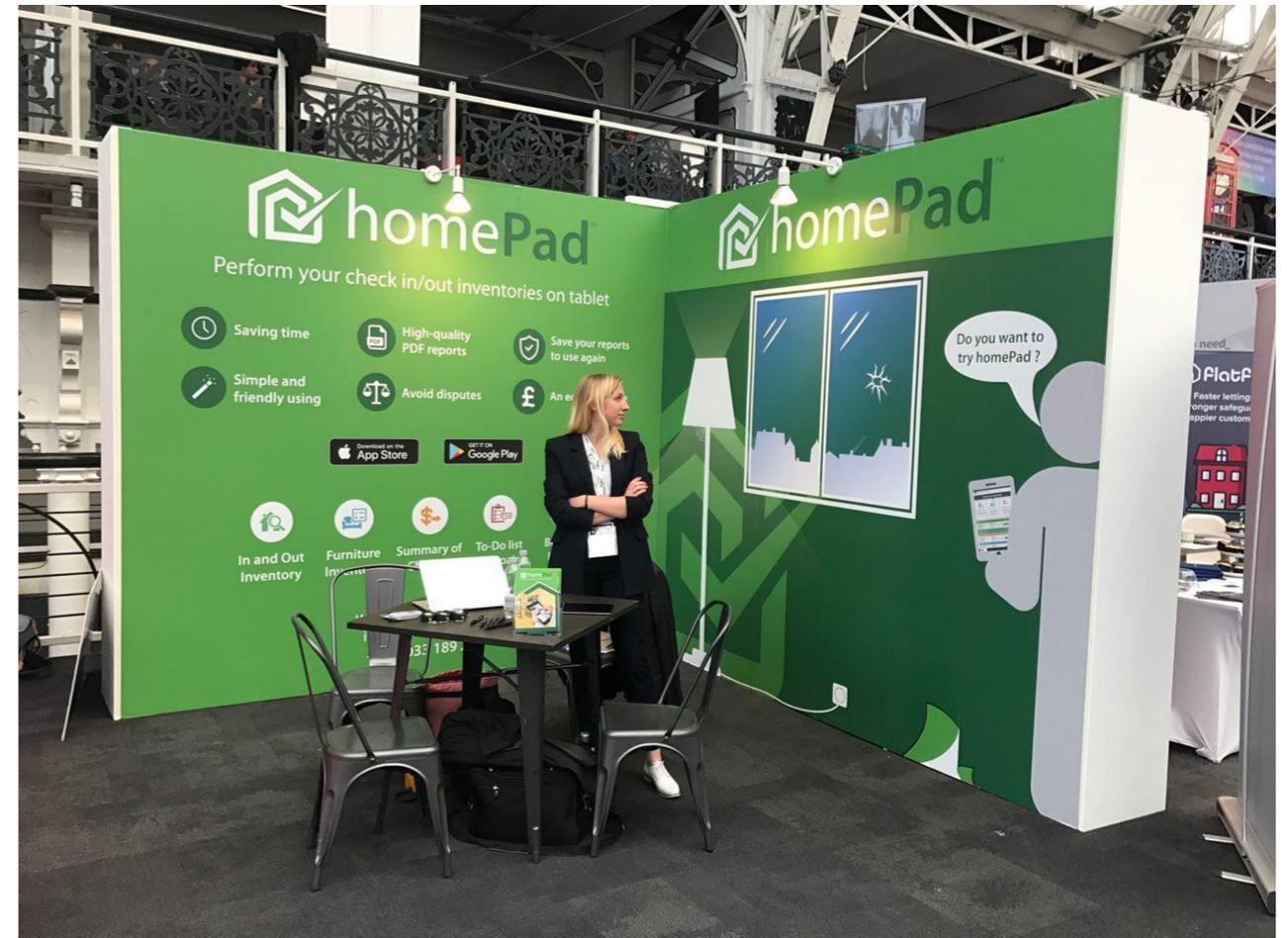PROPY

blockchain

ARGUS

Data Analysis

GuestReady
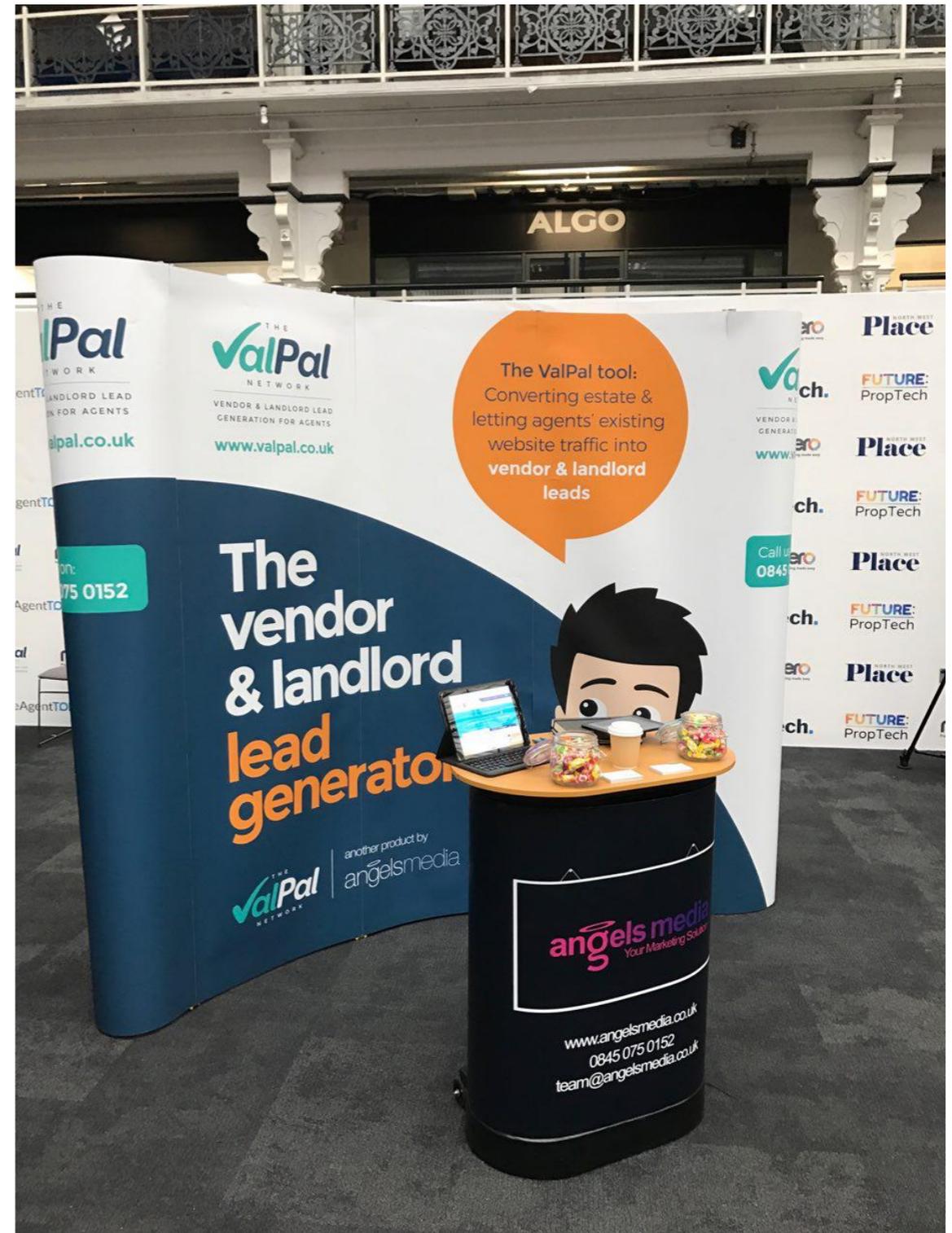
Short term rent

HM Land Registry

Digital contract

Inventorybase

Property audit

Homepad

Property audit

Rent management solution
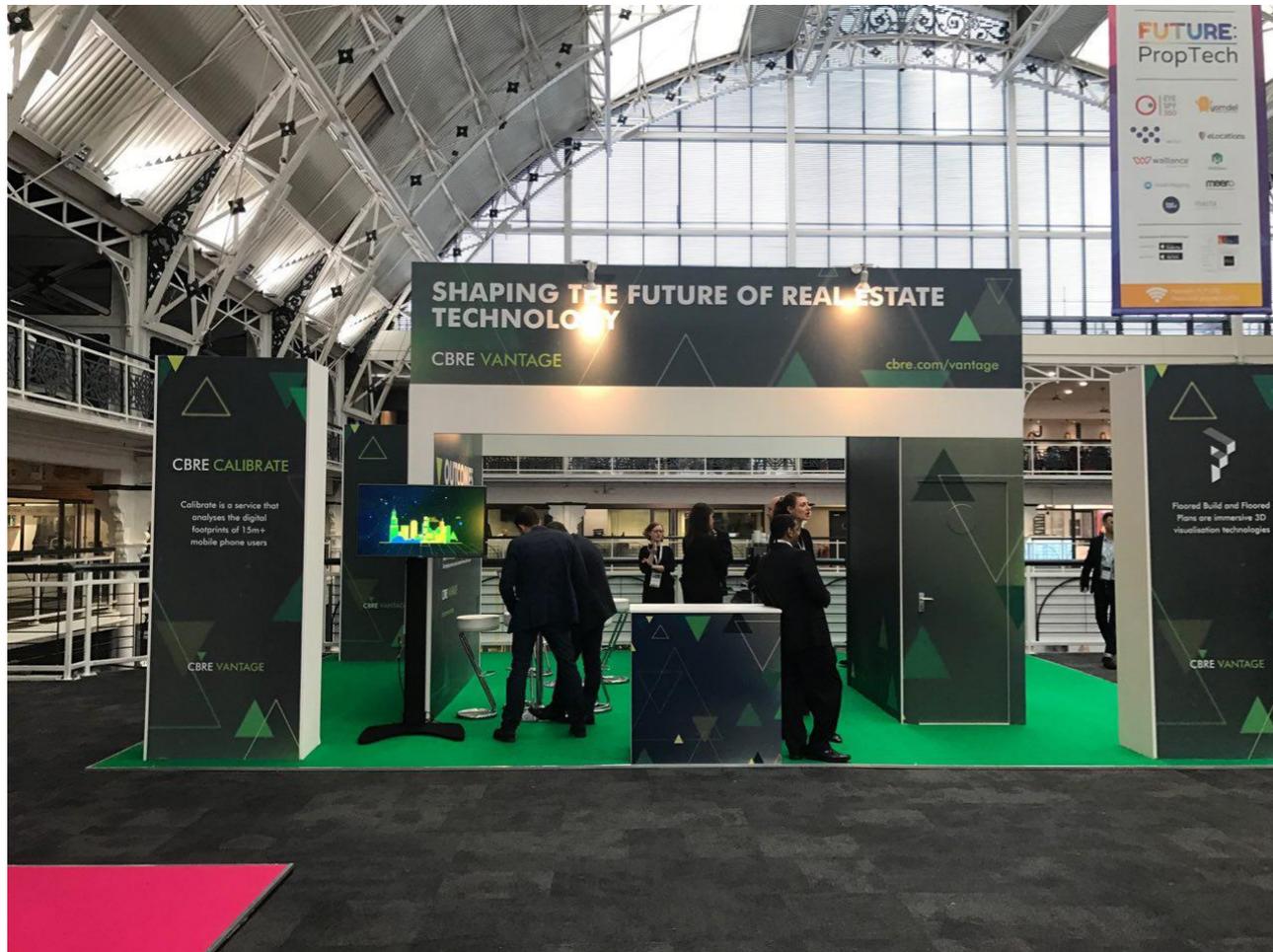

HomeBeat

Valpal

Sales info marketing

OneDome

TDS

Hystreet

Marketing&CRM

ehouse

CBRE

Zoopla

The Next Generation of Surveyors: PropTech and A.I.

프롭테크를 활용한
부동산 산업의
혁신 성장을 기대합니다.