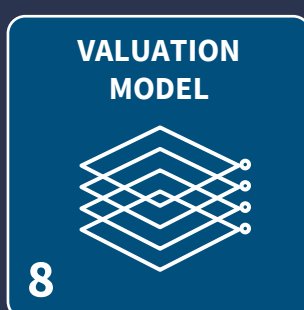


PROPTech SWITZERLAND INNOVATION INDEX 2021

Build a better future with property technology



RELEASING: PROPTech SWITZERLAND INNOVATION INDEX 2021

The index is a detailed study of Swiss PropTech ecosystem. It based on research and development project of PropTech Academy.

It contains markets, sectors, statistics, regions, companies, technology, innovation, sustainability venture capital and many other topics.

The Standards and Guidelines for real estate and construction sectors!

Ranking, Evaluation and Certification of Tech-companies!

PropTech Academy is the global competence center of property technology!

The Academy supports 47 universities in 40 countries in 5 continents!

Foreword

The index is a detailed study of Swiss PropTech ecosystem. It based on research and development project of PropTech Academy Association and PropTech Switzerland Association. The purpose of this study is to analyze PropTech market in technological, innovative and sustainable development context for PropTech companies, investors, the established real estate, construction and finance companies, education institutions and public bodies and the other institutions.

The study based on 7 chapters;

Chapter 1; Real estate, construction and finance markets

Chapter 2; PropTech sectors

Chapter 3; Swiss PropTech statistics

Chapter 4; PropTech in Zurich

Chapter 5; Innovative PropTech companies

Chapter 6; Technology, innovation and sustainability topics

Chapter 7; Entrepreneurship and venture capital

The index is not only a study about the Swiss PropTech market, it is also a reference book for PropTechs founders, initiators, innovators, experts, managers, chief technology officers, chief innovation officers, digital innovation managers, and the others, who work in real estate, construction and finance sectors. The tasks of PropTech communities and the basic requirements of PropTech leadership were also detailed described. In near future the PropTech Academy are going to offer education and examination program for the PropTech community founders (leaders).

The sustainability and the agenda 2030 of United Nations is still hot discussion in the sectors. Everyone is looking for a magic solution. Maybe we should discuss the sustainable transformation of the sectors or the integration of sustainability into the sectors. But the governmental policies and laws and the different kind of business processes slow down them. All the market players must come together and must build common open platform for the sustainable transformation of the sectors. As PropTech Academy, we are going to develop sustainable development evaluation method for real estate and construction companies.

PropTech revolution was the invention of “International PropTech Innovation Evaluation Method” and the development of “International PropTech Standards” in 2020. The evaluation method is the first process its kind in the world and the standards is the first regulation its kind in the world. However the first PropTech Innovation Label has launched by PropTech Academy in this year.

PropTech Academy and PropTech Switzerland Associations are keeping the leading role as regulator, educator and initiator and they are building the bridges between market players and institutions not only in Switzerland, also worldwide. They represent the innovation strength of Switzerland global.

Authors



Deniz Karahan studied law at the University of Zurich and Business Administration at the University of Nine September Izmir. He is working in real estate sector since 2010. He writes regularly books, studies, reports and market analysis in construction, real estate and finance sectors. He is pioneer of property technology worldwide. He is Co-Founder of PropTech Academy Association.



Luca Calanni holds a Master of Science in Real Estate from the Lucerne University of Applied Sciences and is the owner and founder of Calanni Estate Consulting AG who provides business consultation and advisory services to Blockchain and digital real estate projects at every stage. Luca has successfully completed the executive program in Blockchain Technologies from the Massachusetts Institute of Technology and has successfully deepened his studies in Distributed Ledger Technology (DTL) at the University of Zurich. Before founding Calanni Estate Consulting he worked in banking for various financial institutions, particularly in the real estate finance sector and private banking. He is Co-Founder of PropTech Academy Association.



As the head of Digital Planning & Simulations at Gruner Roschi, Manuel has built a reputation for himself and his team as the “go-to” in innovations in HVAC engineering. He helps decision-makers create operative and sustainable high performance buildings by utilizing VDC & BIM in conjunction with building performance simulations and his 19 years of experience in the HVAC industry. Beyond his role at Gruner, Manuel is the President of The International Building Performance Simulation Association (IBPSA) Switzerland and serves as a guest docent at various international academic institutions. He is Co-Founder of PropTech Academy Association.

Authors



Arun Chaubey is an MBA from world's two most reputed Business Schools – Indian School of Business (ISB) and University of St. Gallen (HSG). He helps Re/Insurers to achieve their digital transformation goals by executing business & technology strategy, breaking down the complex problems into smaller pieces, and helping teams to create solutions. He is a LinkedIn influencer, ranks amongst Top 1% in Insurance industry professionals, and has written research paper on AI Enabled Digital Transformation in Insurance Industry. Arun regularly creates and shares contents on Startups, InsurTech, PropTech, FinTech etc. on social media. He is member of PropTech Academy Research Center and UK Ambassador of PropTech Academy Association.



Tayland Karahan is professional creator and designer. He has experience at design, data science and marketing more than 15 years. He studied graphic design at Zurich university of the arts and at 9 September university. He won a lot of prizes for his Graphic Arts. Tayland is Co-Founder of PropTech Switzerland and member of PropTech Academy Research Center. He is responsible for all data science & design tasks and projects. He is responsible for all visual, database activities and publications.

PROPTech ACADEMY ASSOCIATION

The PropTech Academy Association was founded in 2020 and is based in Zurich, Switzerland. It was established to accelerate innovation. It is profoundly Swiss – with the traditional strengths of neutrality and independence, quality and great innovative strength – and acts as a magnet for talents worldwide.

Through education, research and innovation, the Academy's outstanding community of members pursues its mission to serve Switzerland and the world beyond.

Its activities center around research, education, standards certification and ranking systems.

The Academy aims to:

- Provide services, research and development work, particularly in connection with digital transformation and innovation in the construction, real estate and finance sectors.
- Support universities, colleges and companies in addressing digital challenges in the areas of science and business.
- Maintain and promote a dialogue between science and the public about the processes of digital transformation and innovation.
- Promote and support the training and further education of people and institutions in all areas of science and business.
- Organize events that have a national and/or international impact, supporting young talents and developing and reinforcing Switzerland's position as a leading center of innovation.

The PropTech Academy's central platform – encompassing the construction, real estate and finance sectors – provides a combination of innovation, technology and sustainability. As a unique innovative space, the Academy's primary goal is to create an intellectual community of multi-disciplinary professionals to conduct specialist work on innovation that can positively influence the development of these sectors.

At the same time, the PropTech Academy is a regulatory institution that aims to create international standardization and evaluation processes for PropTech companies in the real estate, construction and finance sectors that need quality management systems. These companies set out the requirements that a particular product, service or process must fulfill to qualify as 'fit for purpose.'

Regularly publications

- PropTech Books
- Digital Trends in Real Estate and Construction
- Innovation Index
- Innovation Ranking
- Technology Ranking
- PropTech Homepages Ranking
- Property Management Monitoring
- Real Estate FinTech Monitoring
- Smart Buildings & IoT
- Marketplace Monitoring
- Real Estate Investment Monitoring
- Venture Capital Report

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PropTech Switzerland Innovation Index 2021

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PropTech Academy

Promenadengasse 20

8001 Zürich

Switzerland

www.proptechacademy.ch

Ordering Information:

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REAL ESTATE – CONSTRUCTION –
FINANCE

Markets

Real Estate Market

The most real estate companies have service-oriented businesses that pursue transaction or property holding activities. The real estate is an inherently heterogeneous and fragmented sector. There are many fields of activities, both parallel and sequential, along a building's life cycle (planning, building, management and demolition). Real estate firms are active in one or more than one field, as well as in one or more than one market. Additionally, real estate firms range from family-owned businesses, private to publicly listed companies.

The real estate market is facing a tremendous upheaval, new digital technologies in planning, construction, asset management, marketing, operation and maintenance, facility management and administration are revolutionizing the entire life cycle of a property. The Swiss real estate markets are increasingly with new challenges. The real estate portfolios are getting older, and at the same time the usage requirements change, as well as the desire for flexibility. This goes hand in hand with a proven renovation potential of the current real estate portfolio. These developments are influenced by social trends, such as a change in values towards sustainable buildings and an increasing acceptance of digital change. The sustainability criteria for purchasing decisions by institutional investors will be given crucial importance in the future.

The location is still an absolutely central criterion in the real estate industry. It has a significant impact on real estate valuations, portfolio strategies and the success of real estate projects.

A full recovery from the corona pandemic this year across all real estate business areas is rather unrealistic. The business hotel industry is confronted with negative development prospects, insolvency risks and thus falling prices. A negative price correction is to be expected for retail space and even for office properties outside of the "prime locations". However, the accelerated price increase in recent years has leveled off at a moderate level. The most sought-after properties in Switzerland include single-family houses in central locations. In contrast, prices for condominiums have already fallen slightly in some regions. Buyers continue to pay top prices for building plots. The reason for this is the lack of arable land, which is particularly noticeable in metropolitan areas. Properties in southern and western Switzerland are less expensive. The real estate boom has gradually reached its limit, and in some places prices have already dropped significantly.

The digitization of all real estate business areas is now opening up opportunities because it allows central information to be collected and evaluated more easily. The COVID-19 pandemic has shown how important it is to be able to access data as a basis for various search queries. The effects of the pandemic gave digitization an additional boost. When large parts of the employees work in the home office, the resilience of digital processes is simply a matter of survival. However, digitization will also have a major impact on future office use and space requirements. PropTechs will always have good ideas that will put the classic real estate players under pressure.

Construction Market

Although the construction industry only contributes a good 5% to the overall economic value added, construction investments account for around 15% of Swiss gross domestic product. Around 330,000 full-time positions are located in civil engineering. That corresponds to a third of all employees in the industrial sector. In 2020, the revenue in the construction sector was 5.8 percent lower than in the previous year to 19.5 billion francs. The construction sector is perceived as not very innovative in terms of materials and construction methods. The pandemic has directly affected the construction sector less than other sectors. The construction sites only had to be closed to a limited time in individual cases, but ongoing construction projects could be continued almost without delay. Because of the pandemic, there is uncertainty in the sector. And the investors want to postpone new projects. The demand for office and commercial property in particular is falling significantly. The residential property construction remains stable but significantly less dynamic than before Covid-19. Under the bottom line, Covid-19 could decrease favour construction activity.

The Construction sector involves the entire development of a building from project to demolition. This sector supports all other PropTech areas. The digitalization is not processed in every area of the construction sector. By 'digitalization', we mean the transformation of processes, organizational settings, and project delivery methods that need to be coupled with the adoption of digital technologies in order to gain the full benefits of the digitalization of the architecture, engineering, and construction industry. "The Future for Industrial services is DIGITAL TWIN", as the mentioned quote says, the next big revolution in the Industrial sector is going to be the Implementation of the Digital Twin Technology, which would make many processes simpler when it comes to the Industrial services if it is successfully achieved. The integration of sustainability building design with BIM technology helps the designers to fully grasp the whole building data and information. The distributed ledger technology can, in fact, guide a lean construction process by reducing the industry fragmentation and complexity, making it a single trusted entity. Distributed ledger technology is here, and although it is at an early stage of development with many challenges, it presents a relevant opportunity for all companies in the construction industry to emerge as more effective, transparent, and sustainable entities.

Due to the increasing number of vacant apartments, a decline in construction activity is to be expected in the medium term, especially in regions with poor transport connections. There is great potential in the energy-efficient renovation of building parks. The demand for smaller residential units is increasing, as is the pressure for better utilization of the settlement areas in cities and agglomerations. This makes the replacement of new buildings more important. Digital developments will change construction methods and lead to further increases in productivity. The uncertainty and the feared recession will lead in the short to medium term to higher vacancies in office and commercial space as well as in residential buildings. This should influence the order situation in the construction industry in the medium term.

Swiss PropTech
Ecosystem

Sectors

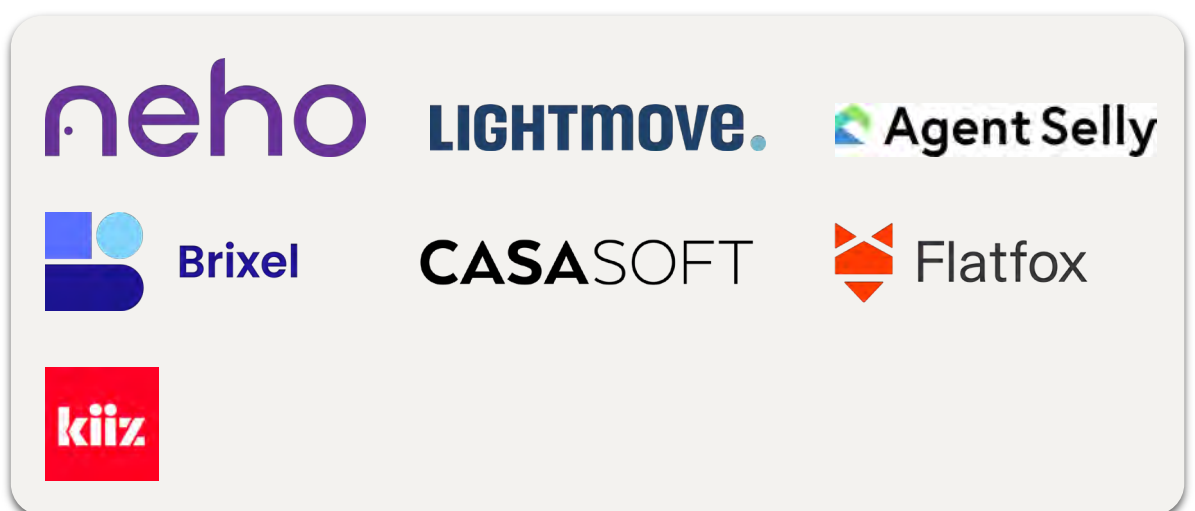
1. Marketplace

The marketplace describes technology-based platforms which change the trading and utility method of real estate. The transaction-centric digital platforms focus on the function as an intermediary, as a digital marketplace, i.e., as a digital marketplace. In other words, the platform brings supply and demand together and enables transactions to be carried out (as in a classic marketplace). They can be online matchmaking platforms, such as an online broker platform, bidding platform, transactions platform or rental platform. These platforms use or build their platform as a service and offer their services with a lot of new tools. This sector supports the real estate occupier and trading markets.

The real estate agents have traditionally operated on a 'sole agency' basis, and are reliant on instructions to sell properties on behalf of the owner for a fee of around 1%-3% of the purchase price in Switzerland. There are also a few companies who offer a common online platform for brokers where they build multiple listing services. The PropTech companies are under 1% of the market share. But both of them use online platforms to acquire new customers and offer their platforms as a service for transactions. Nowadays, 95% of residential sales are generated by online portals and only 5% by estate agents' shop windows.

There are seven companies which are operative in the marketplace sector. They offer 11 services and 9 products. The business areas are; platform as a service, software as a service and digital brokerage. Most of them have matchmaking platforms to bring different market players together.

Swiss PropTech companies in the marketplace sector;



Source: PropTech Academy, PropTech Switzerland, 2021

2. Investment

Real Estate Investment describes technology-based platforms which change the trading method of real estate. They can be online matchmaking platforms, such as crowdfunding, peer to peer or mezzanine platforms. These platforms use or build their platform as a service and offer their services for different kinds of investment possibilities. This sector supports the marketplace, property management, construction and valuation sectors. Investment should be one of the PropTech sectors. Because the main business areas of the real estate industry are; Investment, Development, Management and Trading. These build the lifecycle of buildings.

There are 8 companies which are operative in the real estate investment sector. They offer 9 services and 2 products. The business areas are; platform as a service, crowdfunding and consulting.

Swiss PropTech companies in the real estate investment sector;

CROWDLITOKEN
THE DIGITAL REAL ESTATE ASSET 

 foxstone

 crowdhouse

 BLOCKIMMO

 **INVESTERS**
Démocratisons l'investissement immobilier

 myBrick

 **SWISSLENDING**

YELDO

Source: PropTech Academy, PropTech Switzerland, 2021

3. Property Management

Property Management, which describes technology-based solutions and facilitate the operation of real estate assets. It is the investment-oriented, operational management of real estate objects in the interest of the investors/owners during the management phase and at the interfaces to the design/procurement and utilization phase. The goal is the efficient implementation of the given property strategy with a focus on yield-optimizing property management in the interests of investors/owners.

There are 28 companies which are operative in the property management sector. They offer 6 services and 47 products. The business areas are; platform as a service, software as a service and consulting.

Swiss PropTech companies in the property management sector;



4. Construction

The construction sector involves the entire development of a building from project to demolition. This sector supports all other PropTech sectors. Construction technology as "the collection of innovative tools, machinery, modifications, software, etc. used during the construction phase of a project that enables advancement in field construction methods, including semi-automated and automated construction equipment.

There are 24 companies which are operative in the construction sector. They offer 61 services and 38 products. The business areas are software as a service, platform as a service, raw material, consulting, building, planning, geolocation, geospatial, 3D and mapping.

Swiss PropTech companies in the construction sector;

ALLPLAN
A NEMETSCHek COMPANY

 **AMSTEIN + WALTHER**

 **Abvent**

 **BuildingPoint**

 **BAUSOFT**
Haustechnik-CAD


 **3-PLAN**
HAUSTECHNIK
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REALVIEW.CH

Buildigo.

 **kennwerte.ch**

HausHeld.ch 
Einfach zu passenden Offerten rund ums Haus

smartdevis

 **ABLE**

INSPACION

PLANIBIM SA

 **BIMmo**

FenX

 **oxara**

 **luucy**

DEVIS.ch

MOBBOT

 **habitects**

5. Smart Buildings & IoT

Smart Buildings & IoT describes technology-based solutions which facilitate the operation, management and sustainability of buildings. The assets can be single property units or residential/commercial building. This sector supports construction, asset management, property management and facility management.

The internet of Things is a novel technology model as a large-scale network of machinery and devices able of interconnect by everyone other to collect and exchange information/data. Because of its characteristics, IoT is renowned as one of the most important sectors for future technology. More importantly, it is gaining measureless attention from a wide verity of industries. There is no need to say that contemporary hype around the Internet of Things was massive. It looks like every day a new company comes with a new kind of IoT-enabled product or service. There are several companies in the real estate industry which offer IoT-based service and products.

There are 16 companies which are operative in the property management sector. They offer 18 services and 37 products. The business areas are; energy, water, workflow management, time management, security, blockchain and health.

Swiss PropTech companies in smart buildings & IoT sector;



6. Immersive Reality / Mobility

This sector describes technology-based solutions, which facilitate the development, maintenance and visualization of buildings. It is involved with all other sectors.

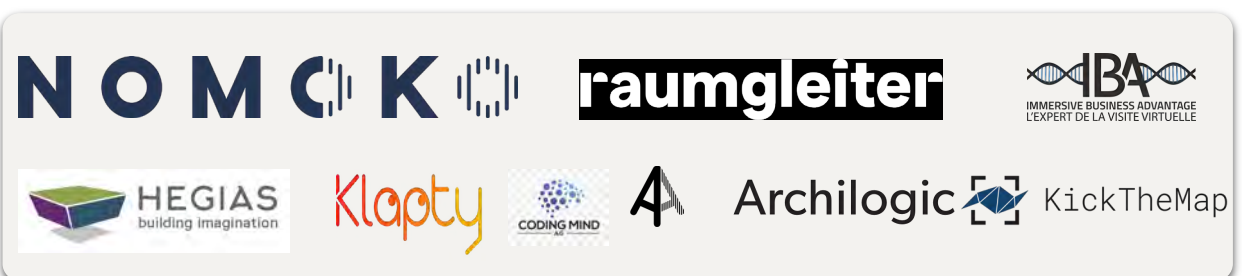
Virtual reality and AR have the potential to transform a number of areas within real estate and the building process:

- Property walkthroughs that can accelerate the sales process for residential brokers.
- Site tours of construction projects that are geographically distant, reducing travel time.
- Project management and supervision of subcontractors on construction sites, and assistance from offsite experts for projects that require unexpected expertise.
- Information modeling for contractors during the building process, allowing stakeholders to avoid costly rework and design that often happens mid-build.
- Tours of commercial spaces for leasing firms, making decision times faster and more efficient for hot markets where properties are often leased before site visits can even be arranged.

Augmented reality is a stimulated experience of a real-world environment. It is a part of virtual reality and allows users to create interactive and memorable experiences. Augmented reality can come in handy when the building is still in the construction stage; however, if you already want to market it and find buyers/renters, augmented reality technology allows you to create a finished product (in the case of properties, it would be a finished building), which looks as close to the real one as possible.

There are 8 companies which are operative in the property management sector. They offer 15 services and 7 products. The business areas are geolocation, geospatial, mapping, virtual tours, platform as a service and software as a service.

Swiss PropTech companies in the immersive reality and mobility sector;



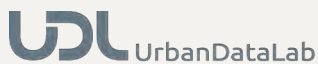
Source: PropTech Academy, PropTech Switzerland, 2021

7. Big Data Analytics

Big Data Analytics is the main sector in property technology and has impacts on each PropTech sector, from land, planning, construction, sales, leasing, letting, occupation, maintenance to the end of life. Within real estate, big data can be thought of as that which is being produced in near real time, and too voluminous for traditional regression and spreadsheet models, like an excel data, to interpret. Big data has three common data-mining characteristics: massive data volume, processing speed and data coverage.

There are 11 companies which are operative in the property management sector. They offer 26 services and 19 products. The business areas are consulting, analytics, data trading, property management, asset management and portfolio management.

Swiss PropTech companies in the big data analytics sector;



Source: PropTech Academy, PropTech Switzerland, 2021

8. Valuation Model

Valuation is one of the most important parts of the real estate industry. Without valuation we cannot determine the value of properties and the worth of rents. Because of that reason, the valuation model is as PropTech sector defined. It cannot belong to any other sectors or be defined as part of any sectors in the PropTech market.

Property valuation is an integral part of the housing industry that is long overdue for improvement in various ways. Automated Valuation Model is a mathematical or artificial intelligence-based computer software that can predict residential property prices based on the housing characteristics. The prediction accuracy of an AVM depends on the available data and the backbone calculation mechanism within an AVM. AVMs are characterised by the use and application of statistical and artificial intelligence techniques.

Automated valuation models (AVMs) are mathematical models, which, together with appropriate computer software and databases of property information, are used to provide real estate valuations. AVMs are categorized into at least five types. These are hedonic models, econometric forecasts, 'intelligent' systems, house price index models and tax-assessed value models.

There are 4 companies which are operative in the property management sector. They offer 17 services and 22 products. The business areas are: AVMs, classic valuation models, data trading, analytics, platform as a service, software as a service and consulting.

Swiss PropTech companies in the valuation model sector;

**FP
RE**

 PriceHubble

**IAZI
CIFI**

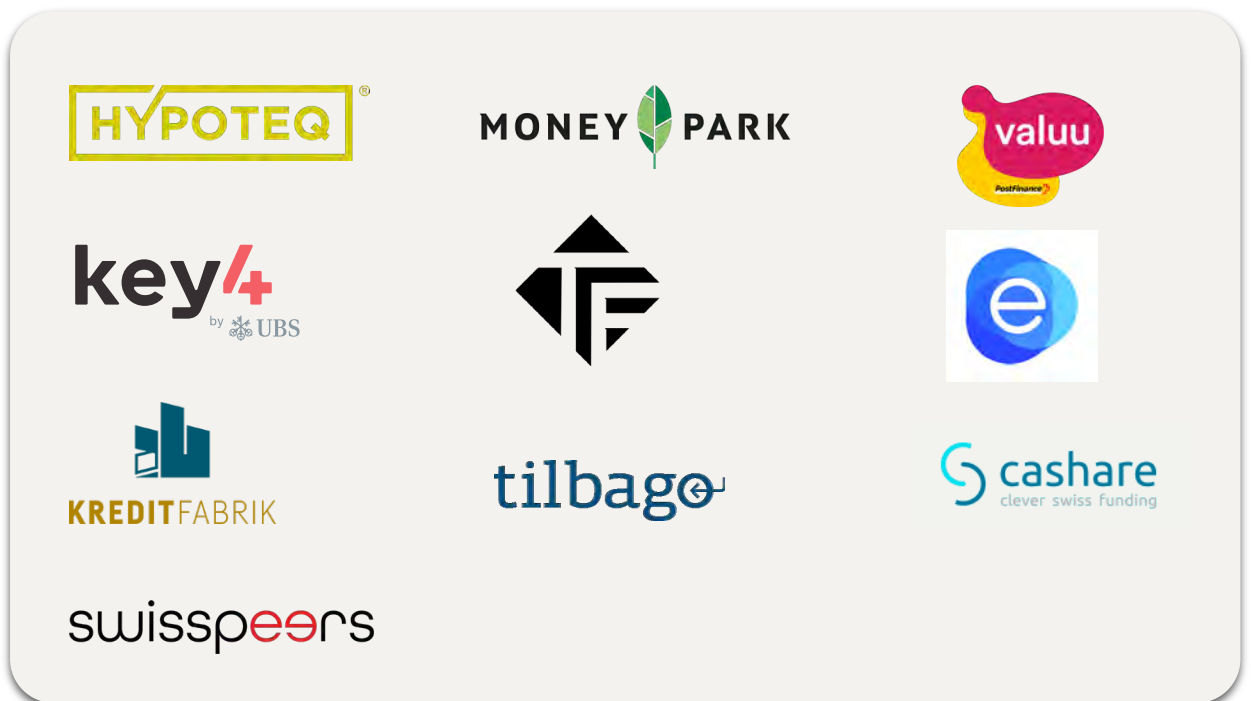
 wüestpartner

9. Real Estate FinTech

Real Estate FinTech describes technology-based solutions which facilitate the trading of real estate assets. The platforms may simply provide information for prospective buyers and sellers, or they may more directly facilitate or effect transactions of asset ownership or leases with a capital value. This sector supports the real estate capital markets.

There are 10 companies which are operative in the property management sector. They offer 16 services and 1 product. The business areas are credit trading, brokerage, blockchain, lending, debt collection and consulting.

Swiss PropTech companies in the real estate FinTech sector;



Source: PropTech Academy, PropTech Switzerland, 2021

Swiss PropTech
Ecosystem

Statistics

Swiss PropTech Ecosystem

About 130 verified PropTech companies, 523 Founders and 3700 employees were registered till May 30th, 2021. There are still some companies which did not evaluate yet. About 47% of the audited PropTech companies are based in the canton of Zurich. The Swiss PropTech market grows slowly. Only 9 new PropTech companies were found in 2020, and there was no new founding in the first half of 2021.

Covid-Measures and Home-office have impacts on the market and PropTech companies. The most investors stopped the investment process and preferred to wait for the government policy and the action of the market itself. The most of the companies reduced the cost and employees. The webinars and online meetings have negative impacts on business. Many companies could not realize that the webinars or online meetings have minimum benefits or results.

The “sustainability” and “innovation” were the magic words in 2020, and they are still magic. There is no homepage, presentation or whitepapers without these words. The sustainability and ESG criteria were the most discussed topics in the real estate sector in opposite to the construction sector. The established real estate investment institutions joined the agenda 2030 for sustainable development by united nations. But they did not have the road map or the clear program for the SDGS.

The most established real estate, construction and finance companies do not trust the PropTech Startups. They are still skeptical because of the unexperienced young teams and fewer use cases. Some brave investors, like insurance companies, acquire the startups to develop and use their solutions.

However, the collaborations and partnerships were another important topic. For surviving a lot of startups start to work together or started to build small ecosystems (with 3 or 4 companies). It is called PropTech to PropTech. This type of cooperation or partnership describes collaboration between two or more PropTech companies. The possible reasons for collaboration were:

- Building an ecosystem
- Bundling products and services
- Get access to client groups
- Marketing and reputation
- Sharing know-how and data

The milestone of the global PropTech market was the development of “international PropTech standards” and the development of “international PropTech innovation evaluation method”. The research and development of the standards, guidelines, evaluation methods took more than two years. The international PropTech Standards are established by PropTech Academy in 2020. The association is a regulatory institution aimed to create international standardization and evaluation process of

PropTech companies in the real estate, construction and finance sectors. The PropTech innovation evaluation process was developed in Switzerland and is the first process of its kind in the world. It was used in the creation of the International PropTech Standards. The methodology symbolizes innovation and invention. PropTech Academy developed a new method to evaluate companies according to innovation degree in many categories and with more than 100 criteria in real estate, construction and finance sectors.

Insurance companies play an important role as investors in the Swiss PropTech market. Mobiliar insurance company, which is based in Bern, acquired PropTech startups Buildigo and Flatfox to build its own ecosystem. Through PropTech network, Mobiliar opens new channels for the insurance services and products. Helvetia insurance company has shares by MoneyPark, PriceHubble and readydata. Houzy has shares by Houzy. The Swiss Life insurance company has shares by Archilyse. The banks or individual investors stay still distanced. The most of the investors do not have experience in the new market: PropTech. PropTech is not only the ICT sector or not only the real estate or construction sector. PropTech is a new common market which contains all four sectors (real estate, construction, finance and ICT). That's why we should have to have a rethink about the digitization or digital transformation. PropTech academy built the first property technology research center and analyzed the sectors, companies, business models, services and products regularly. It publishes studies, reports and books about the international PropTech market. However, the academy offers investment analysis to the investors. The research center will have an important role and build a bridge between science and business.

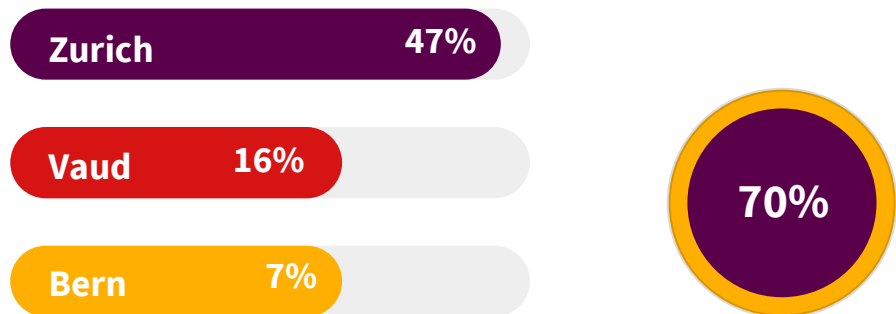
The future of the Swiss PropTech market; we are not expecting any Swiss unicorn in the next 10 years. However, the Swiss PropTech market is limited and too small for the unicorns. The most of the startups will be integrated into the established investment companies, or they must build joint ventures. Matchmaking solutions will play an important role in the near future. The classical property listing platforms will lose more market shares. Some of them will be acquired or build joint ventures with competitors to stay alive. Real estate and construction giants will collaborate with the tech sector to build industry best practices. All classical real estate and construction companies will have to use PropTech solutions, such as an immersive reality, data analytics, sustainable products, automated valuation models, workflow management tools, cloud-based solutions, building information and simulation models etc. PropTech companies, which produce software and tools, will create flexible solutions to build an API (application programming interface) ecosystem. The PropTech companies should have to change their mindsets and start to create all in one solution for the lifecycle of building. The cooperations and partnerships will be key features of success and growing.

PropTech Academy and PropTech Switzerland Associations are keeping the leading role as regulator, educator and initiator, and they are building the bridges between market players and institutions.

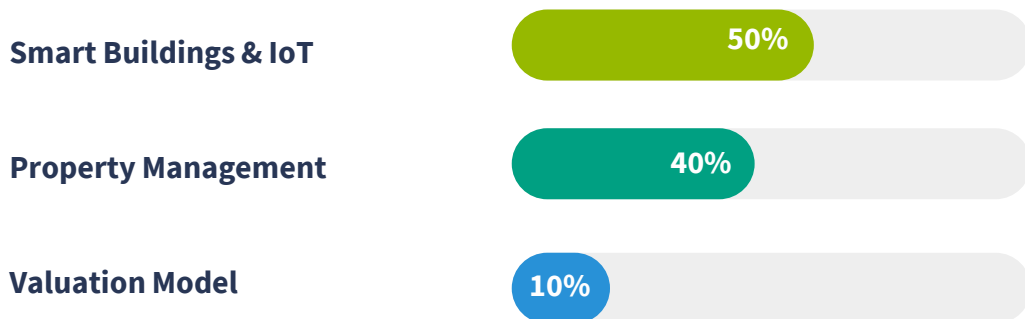
Swiss PropTech Overview

In this study, 130 companies are audited. They offer 189 services and 161 products for real estate, construction and finance sectors.

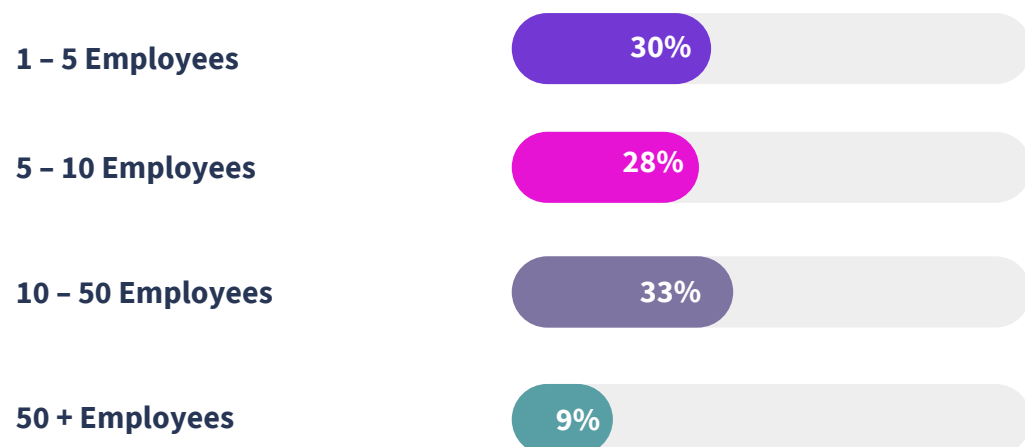
The top 3 Innovation economies by Cantons according to the number of companies and business models. About 70% of companies are based in three cantons.



Top 3 Innovative PropTech Sectors

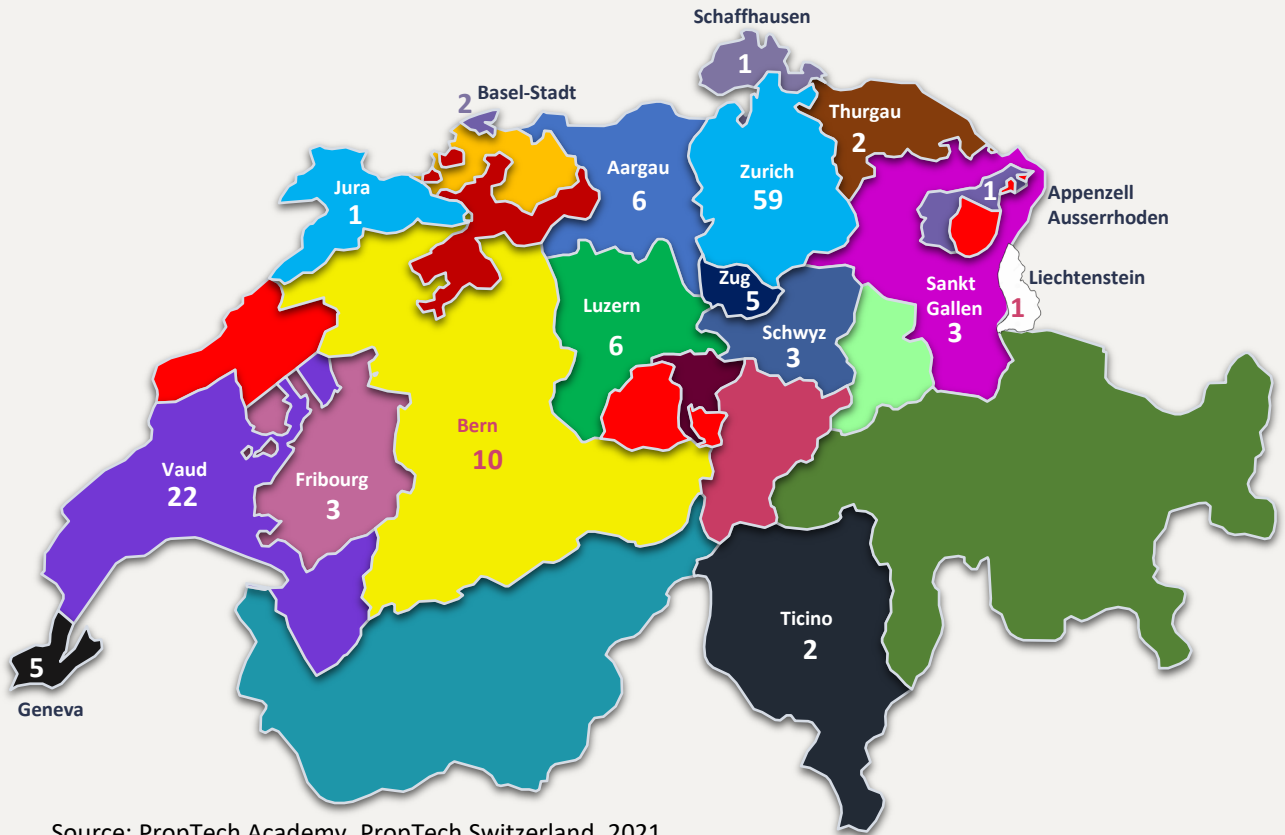


The size of companies in Swiss PropTech market



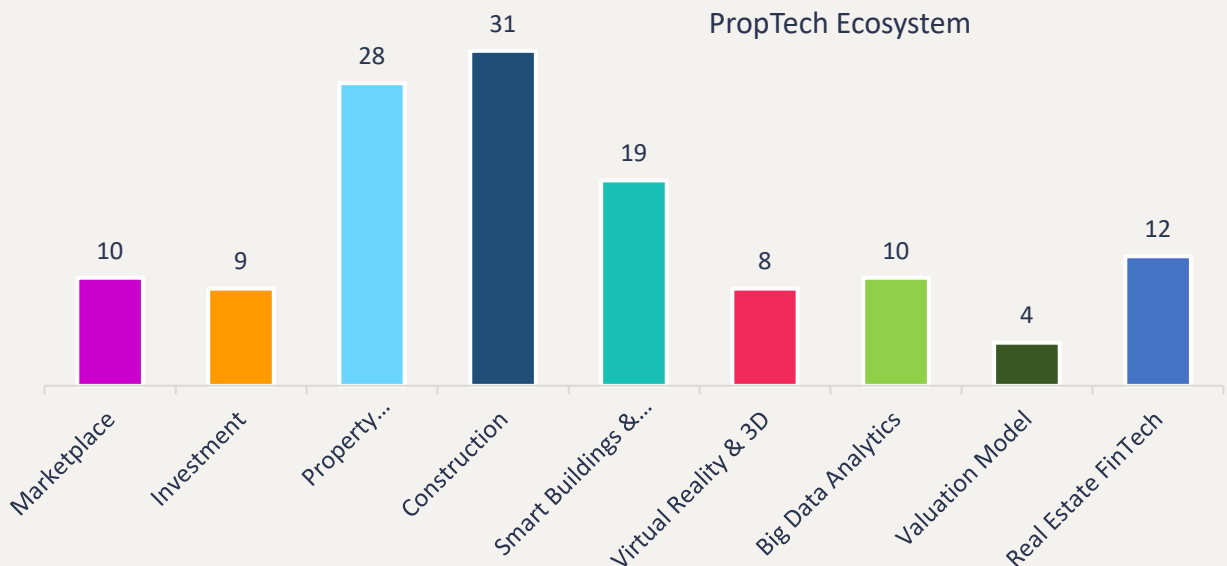
Source: PropTech Academy, PropTech Switzerland, 2021

The geographic distribution of Swiss PropTech ecosystem



Source: PropTech Academy, PropTech Switzerland, 2021

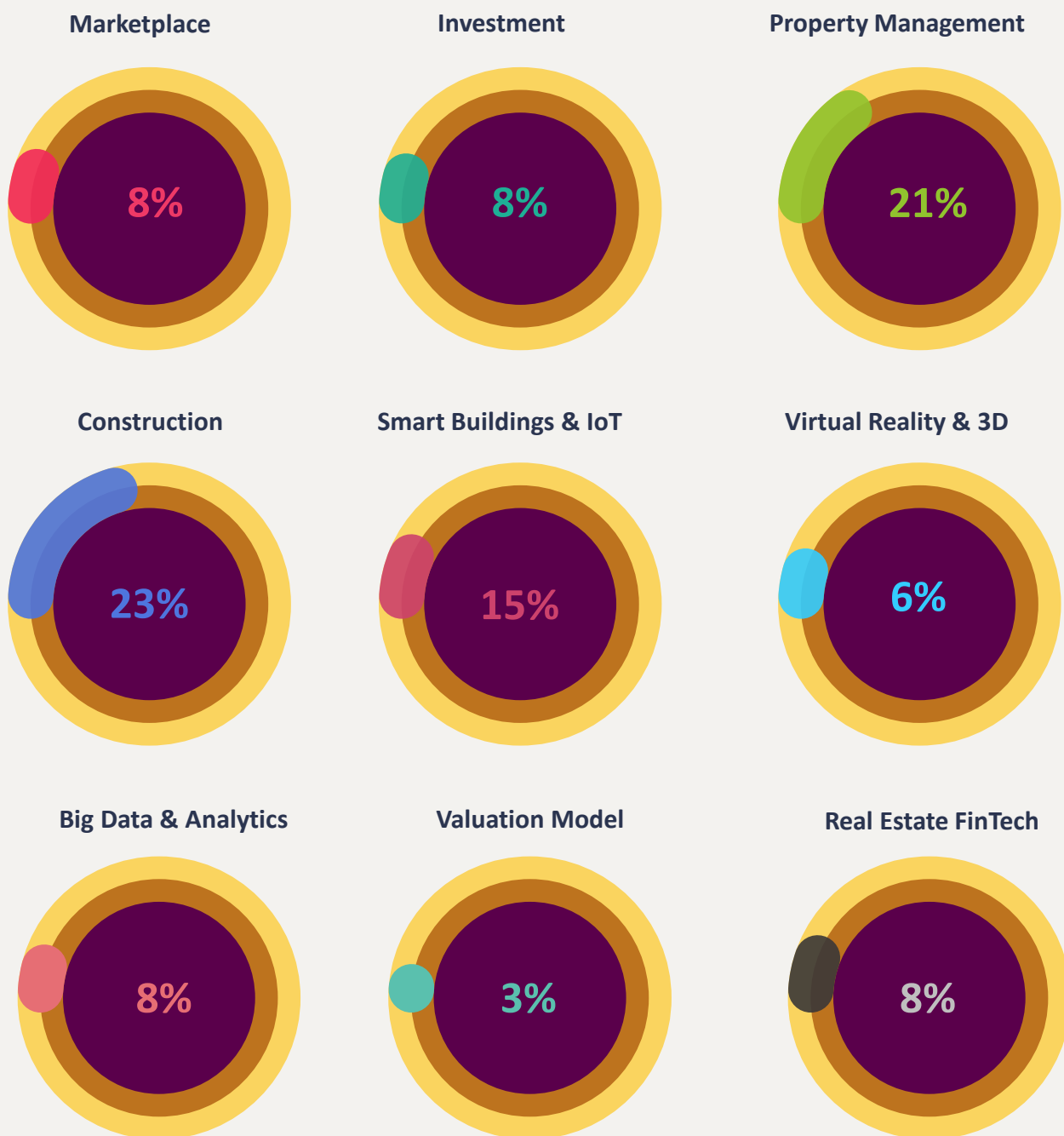
Three cantons (Zurich, Vaud and Bern) dominate the market. Around 67% of companies are based in German-speaking cities. The 130 audited PropTech companies are presented in this map. The companies, which do not fulfil the standards, did not present. Co-Working, WeWork, Co-Living companies are not PropTech. The most of the PropTech companies are active in property management, construction and smart buildings & IoT sectors.



Source: PropTech Academy, PropTech Switzerland, 2021

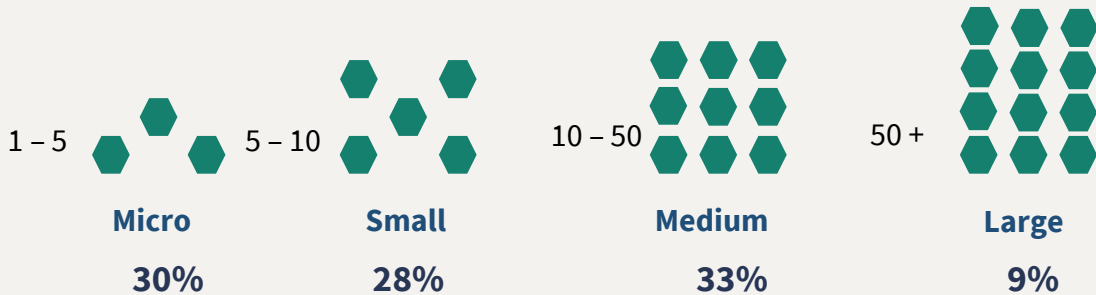
The market share of the PropTech sectors (According to the numbers of companies in 9 PropTech sectors)

Construction, property management and smart buildings & IoT sectors have the most PropTech companies. In the near future we will see more startups founding in big data analytics and smart buildings & IoT sectors. Because the Internet of Things and property analytics, location analytics, maintenance analytics and inspection analytics with drones and predictive analytics will also create new business areas. Matchmaking platforms, such as rent or buy, will dominate the trends. The online property listing platforms lose more market shares.



The size of companies in PropTech market

The companies are categorized into four categories. Micro companies consist of founders and a maximum of 1 or two employees. Small companies have two or more founders and 3 or 5 employees. Most micro and small companies can already show some user growth and/or revenue. They are looking for clear market validation (Product Market Fit). The medium companies have high market shares in the sectors. Most of the large companies are the established ICT and consulting companies, which were transformed into PropTech companies and existed more than ten years in the market.



The statistics of the founders and employees in the sectors

Founders

Employees



99,43%
520
Male Founders

0,57%
3
Female Founders

88,43%
3272
Male employees

11,57%
428
Female employees

Companies 130 Founders 523 Employees 3700

Marketplace	
Founders	20
Employees	134
Totally	154

Investment	
Founders	17
Employees	135
Totally	152

Property Management	
Founders	39
Employees	360
Totally	399

Construction	
Founders	41
Employees	1789
Totally	1830

Smart Buildings & IoT	
Founders	43
Employees	229
Totally	272

Virtual Reality & 3D	
Founders	18
Employees	131
Totally	149

Big Data Analytics	
Founders	20
Employees	90
Totally	110

Valuation Model	
Founders	27
Employees	446
Totally	473

Real Estate FinTech	
Founders	11
Employees	386
Totally	397

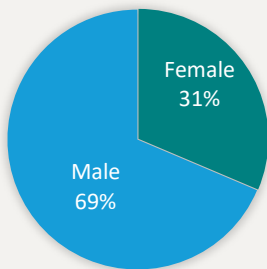
Source: PropTech Academy, PropTech Switzerland, 2021

The gender of employees in PropTech sectors

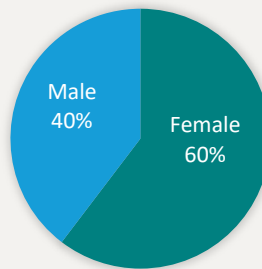
About 130 companies are analysed in the Swiss PropTech market. According to the statistics, female employees are less than male. Female labour has only 11,57% of the market share. The most of the females work in consulting and management areas. Unfortunately, there are a few female employees who have important positions in the companies. For example, there are not any female data science experts or IoT experts.



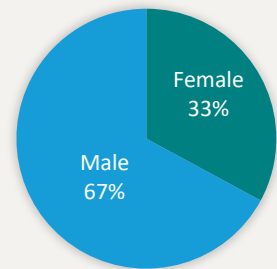
Marketplace



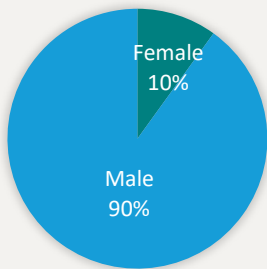
Investment



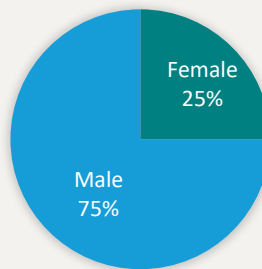
Property Management



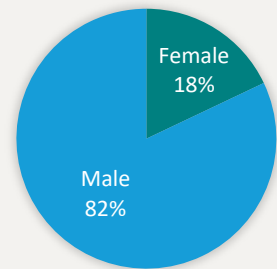
Construction



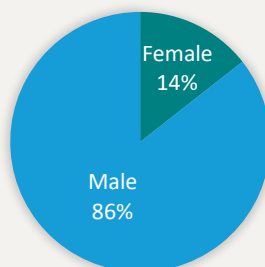
Smart Buildings & IoT



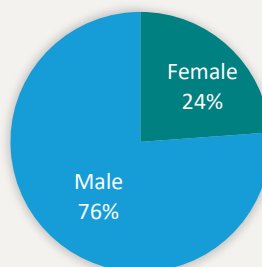
Virtual Reality & 3D



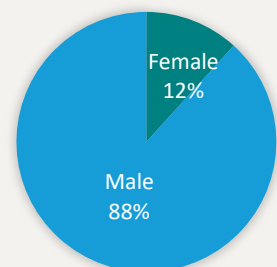
Big Data Analytics



Valuation Model

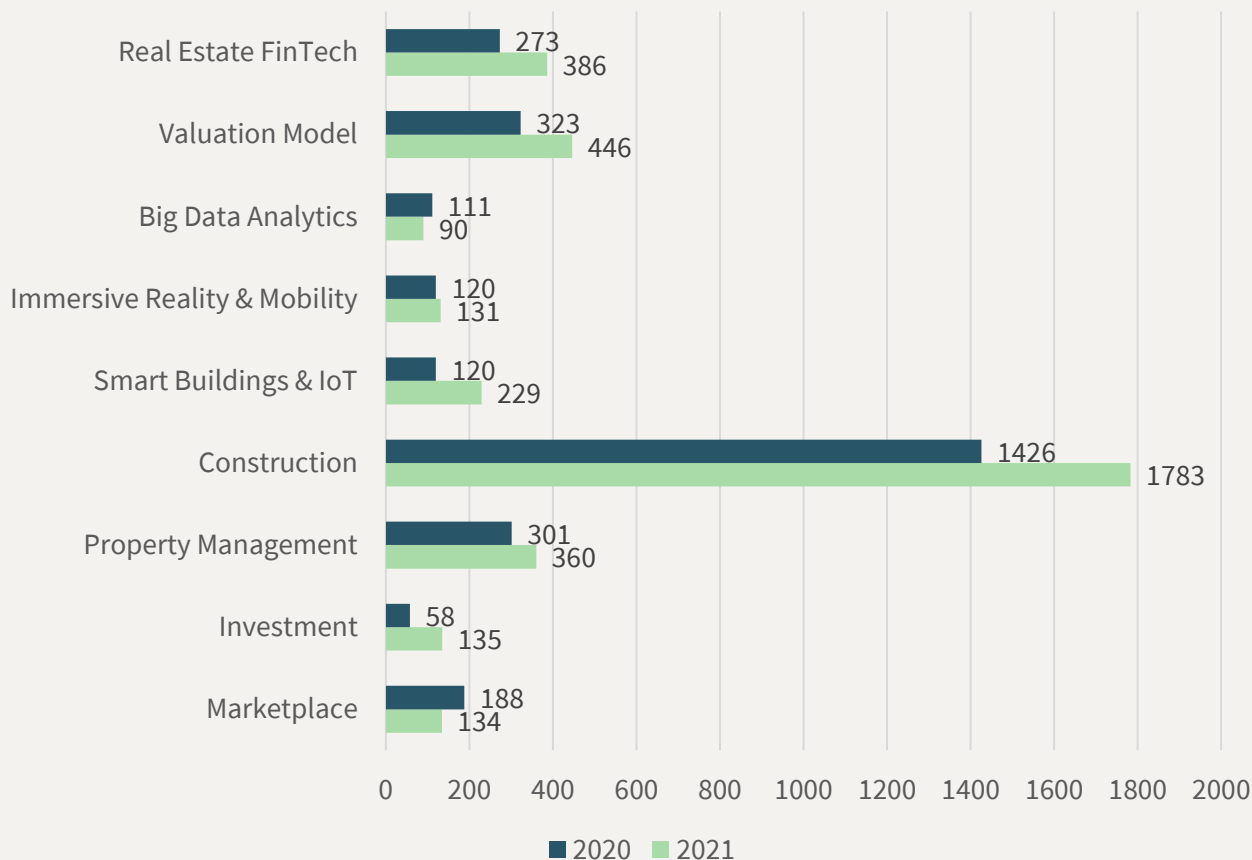


Real Estate FinTech



The statistics of the employees in Swiss PropTech market

Comparison the numbers of employees in sectors between 2020 and 2021



The growing sectors according to the numbers of employees between 2020 - 2021

Marketplace

-28%



Investment

+132%



Property Management

+19%



Construction

+25%



Smart Buildings & IoT

+107%



Immersive Reality & IoT

+9%



Big Data Analytics

-18%



Valuation Model

+38%



Real Estate FinTech

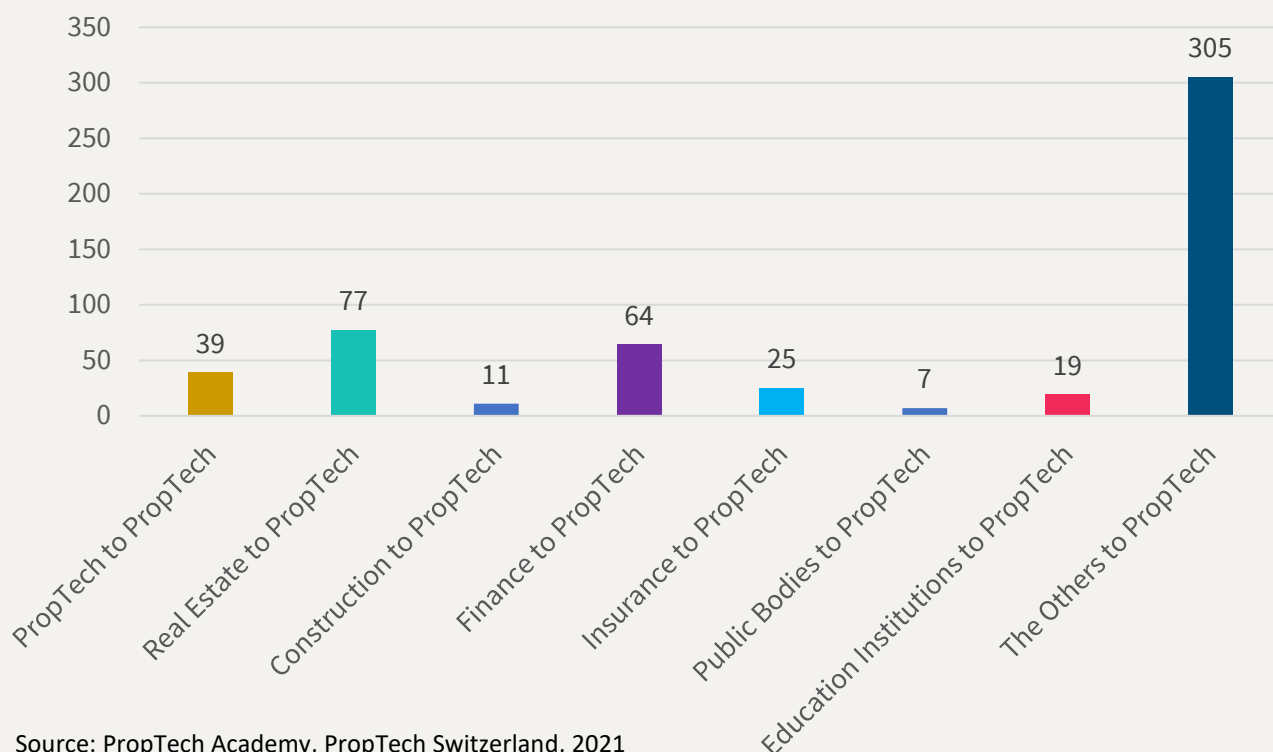
+37%



The cooperations and partnerships in Swiss PropTech market

In the Swiss PropTech market there are 130 verified real PropTech companies and only 65 of them have cooperations and/or partnerships with other companies.

Collaboration Overview in Swiss PropTech Market



Source: PropTech Academy, PropTech Switzerland, 2021

The cooperation and partnership areas are;

- Real Estate
- Construction
- Finance
- ICT
- Insurance
- Health

31 PropTech companies have a partnership with 45 real estate companies.

5 The PropTech companies have a partnership with 5 construction companies.

15 PropTech companies have partnership with 62 finance institutes.

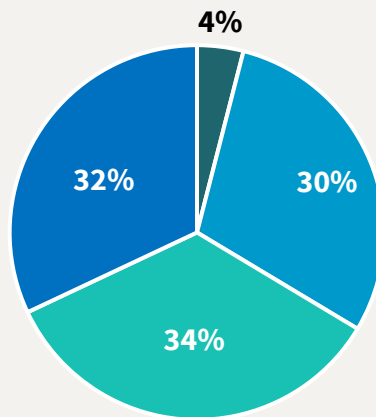
5 PropTech companies have partnership with 22 insurance companies.

5 PropTech companies have partnership with 8 public institutions.

9 PropTech companies cooperate with 6 education institutions.

20 PropTech companies cooperate or have a partnership with 97 ICT companies..

The Lifecycle of Startups in Switzerland



■ Commitment ■ Validating ■ Scaling ■ Establishing

Commitment	10 companies
Validating	37 companies
Scaling	43 companies
Establishing	40 companies

Source: PropTech Academy, PropTech Switzerland, 2021

Committed & skills balanced founding team. Able to develop the products/services (Minimum Viable Product) without dependency of uncommitted external resources or already have initial products/services developed. Have signed a shareholder agreement between founders, with milestones, committed time and money usage, for min. 2+ years with vesting etc.

Validation

Can already show some user growth and/or revenue (initial traction). AND/OR continue to attract additional resources (money or sweat equity) for equity or future revenues. Looking for clear market validation (Product Market Fit), to be able to move into scaling.

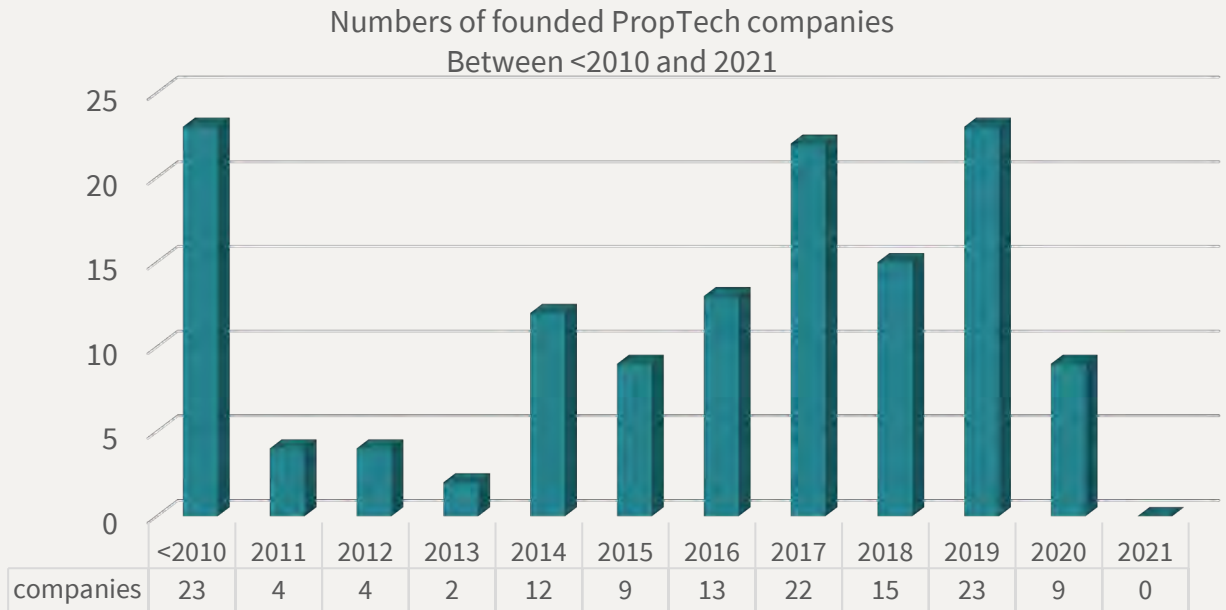
Scaling

Showing clear, growing and measurable user/market traction in a big or rapidly growing target market. Can and want to scale fast. AND/OR is able to attract significant funding.

Establishing

Achieved great growth that can be expected to continue strong. No longer need to „try“ to get resources and can get them easily. Continue to grow and often want to continue behaving like a „start-up“ for as long as possible. Founders make exit or continue business as usual.

Tech company founding between <2010 and 2021 in Switzerland

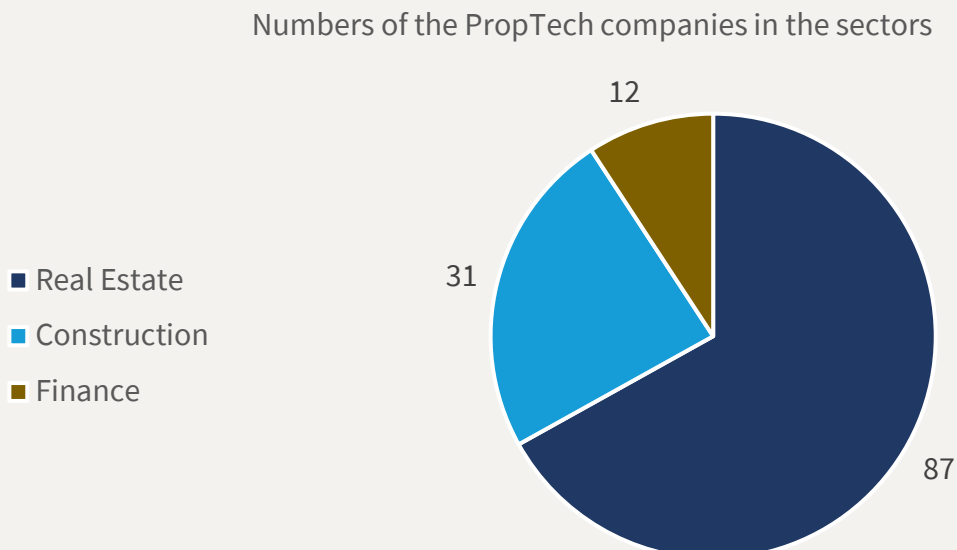


Source: PropTech Academy, PropTech Switzerland, 2021

About 45% of the PropTech companies were found between 2017 and 2020. The PropTech companies, which were found in 2010 or before, still have the most market share, and they are established companies.

The audited 130 PropTech companies are presented in this map. The companies, which do not fulfil the standards, did not present. Co-Working, WeWork, Co-Living companies are not PropTech.

PropTech market share of the real estate, construction and finance sectors according to numbers of PropTech companies in these sectors.



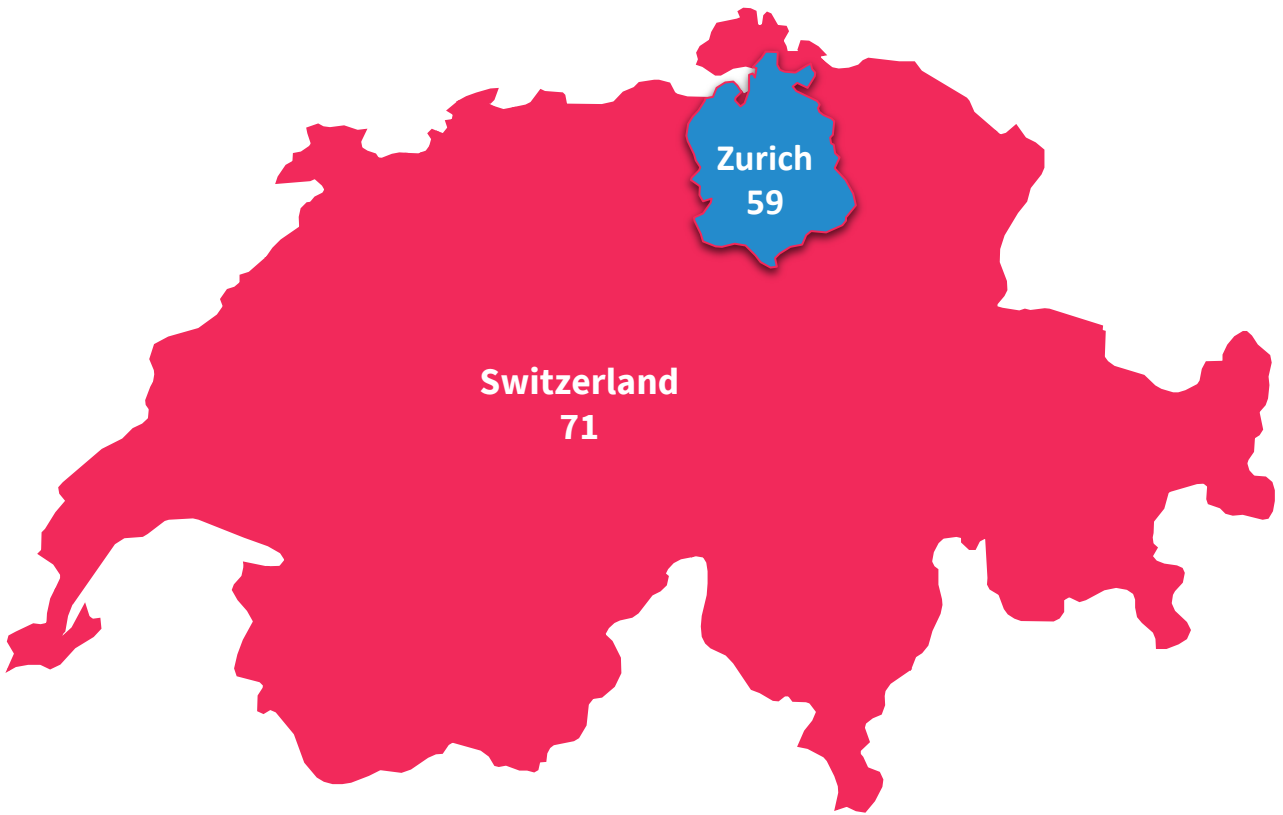
Source: PropTech Academy, PropTech Switzerland, 2021

PropTech
in

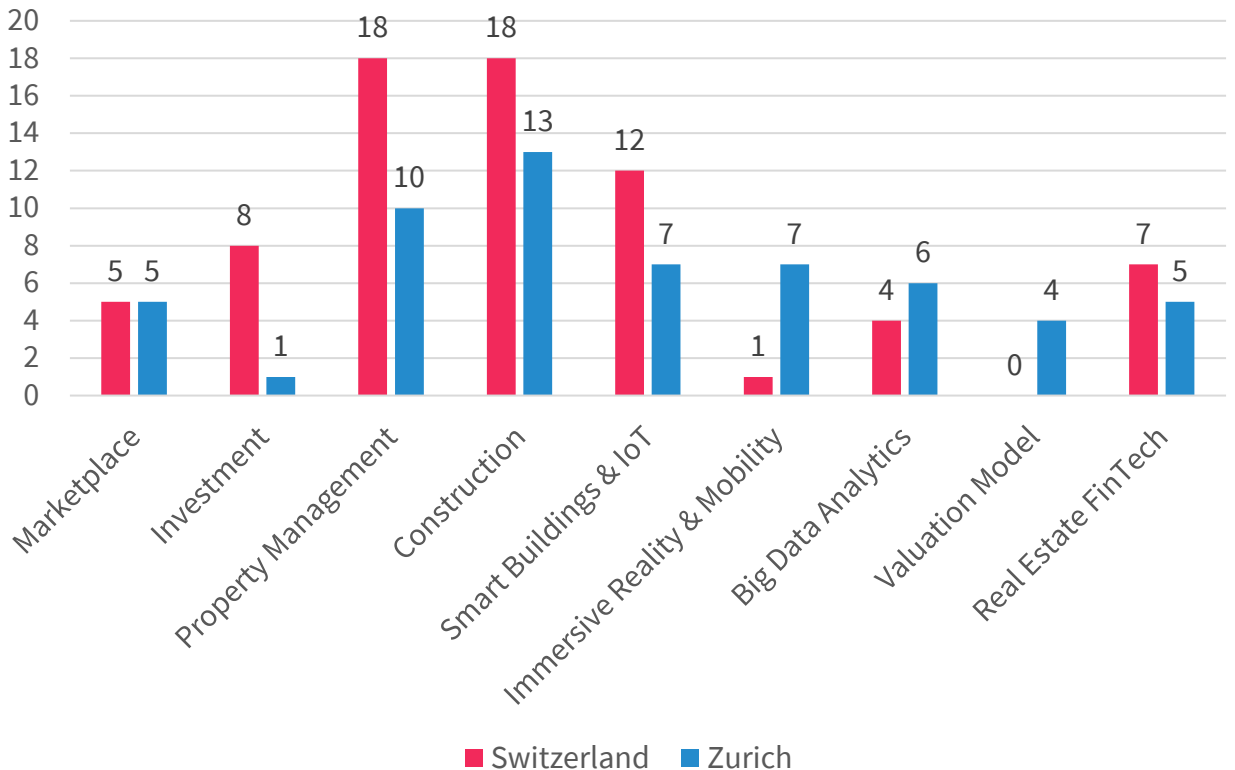
Zurich



Geographic distribution Switzerland – Canton Zurich



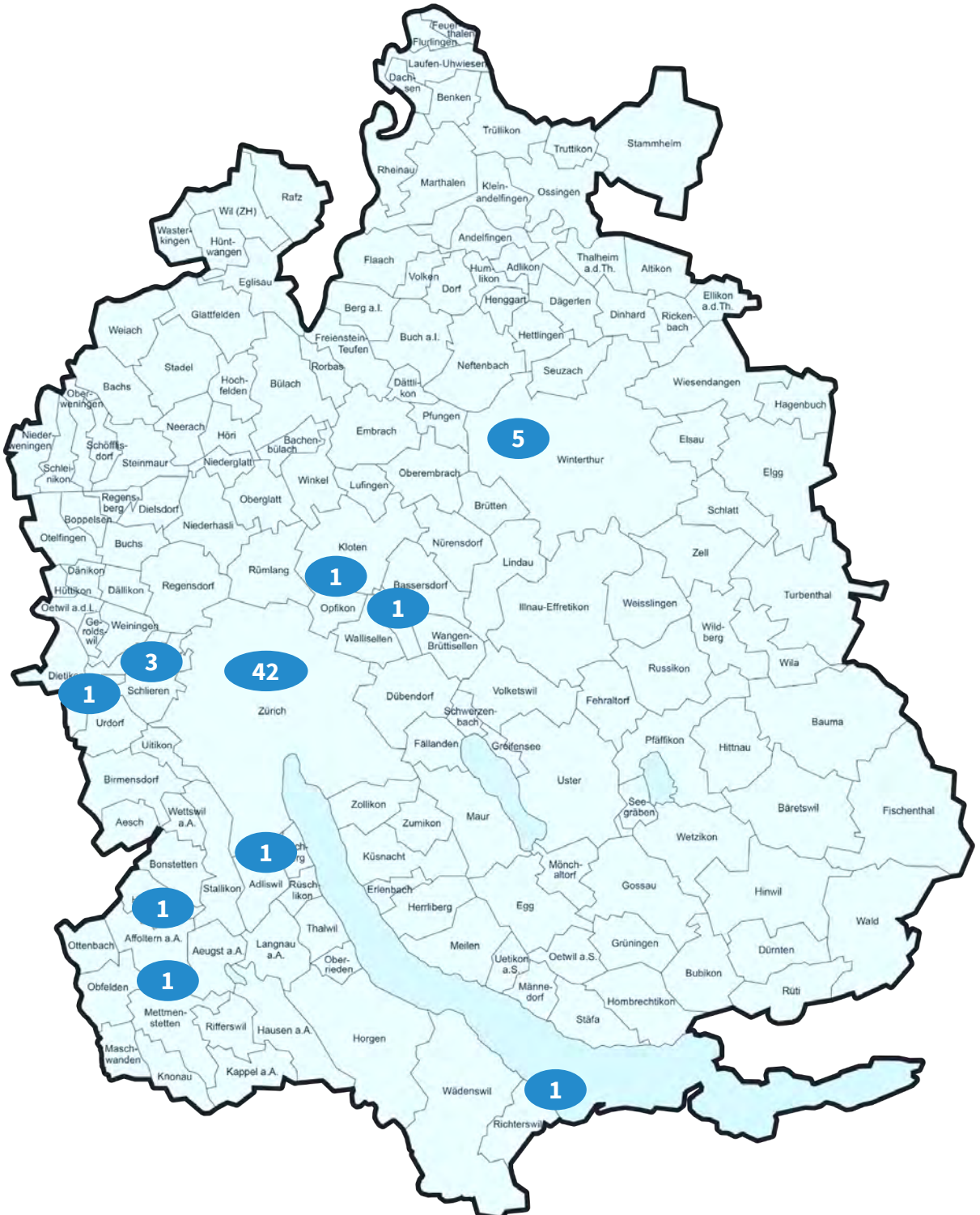
There are totally 130 PropTech companies in Switzerland, and 45% of them are based in the canton Zurich. The comparison between Switzerland and the canton of Zurich in PropTech sectors according to the number of companies.



Zurich PropTech Ecosystem

Geographic distribution of PropTech companies

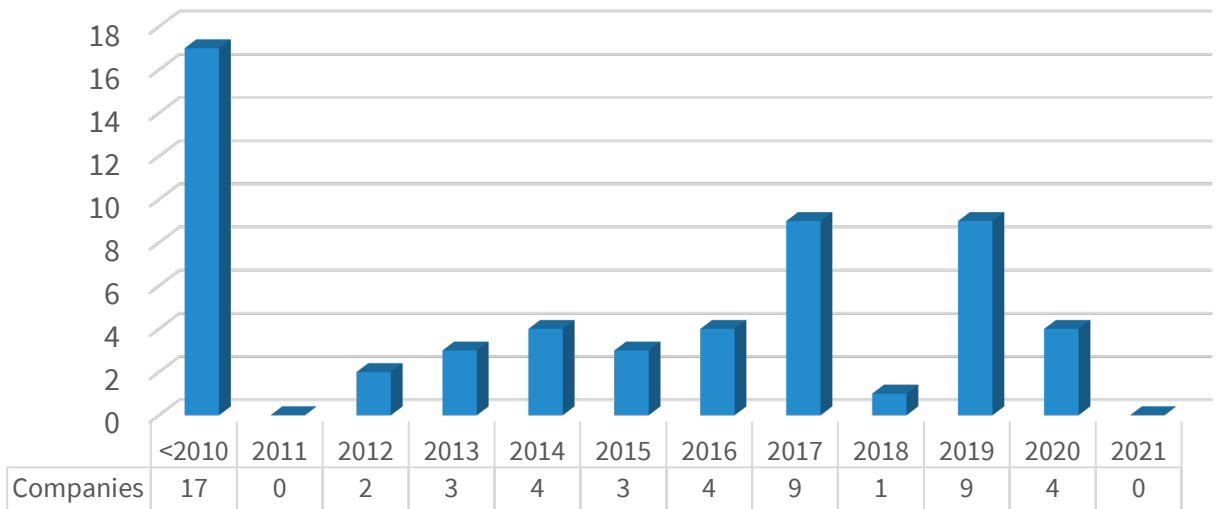
There are 130 audited PropTech companies in Switzerland which fulfill the basic criteria of International PropTech Standards and 47% of them are based in the canton Zurich. There are totally 59 verified companies.



Source: PropTech Academy, PropTech Switzerland, 2021

Map; <https://www.zh.ch/de/planen-bauen/geoinformation/geodaten/geodatenshop/vorlagen-fuer-administrativer-grenzen-und-karten.html/>

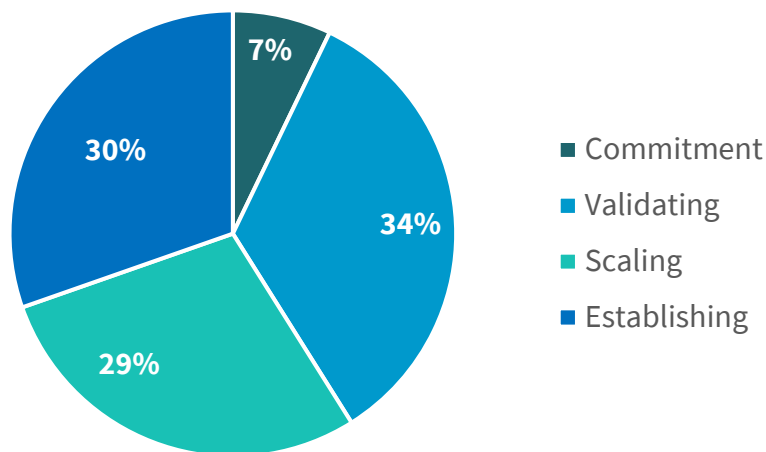
Numbers of PropTech Founding between <2010 and 2021 in canton Zurich



Source: PropTech Academy, PropTech Switzerland, 2021

■ Companies

The Lifecycle of PropTech Startups



Source: PropTech Academy, PropTech Switzerland, 2021

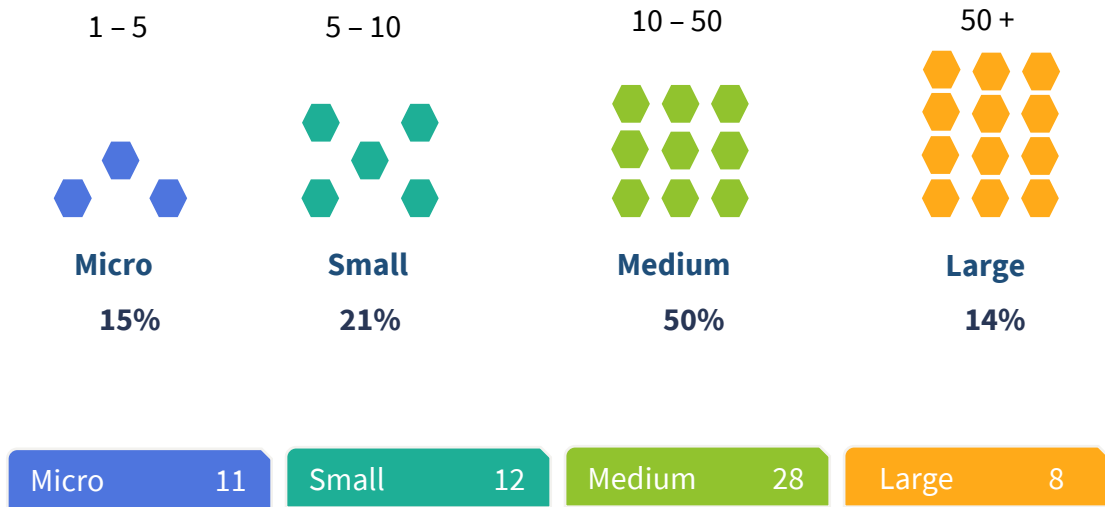
Committed & skills balanced the founding team.

Validation: Can already show some user growth and/or revenue (initial traction).

Scaling: Showing clear, growing and measurable user/market traction in a big or rapidly growing target market.

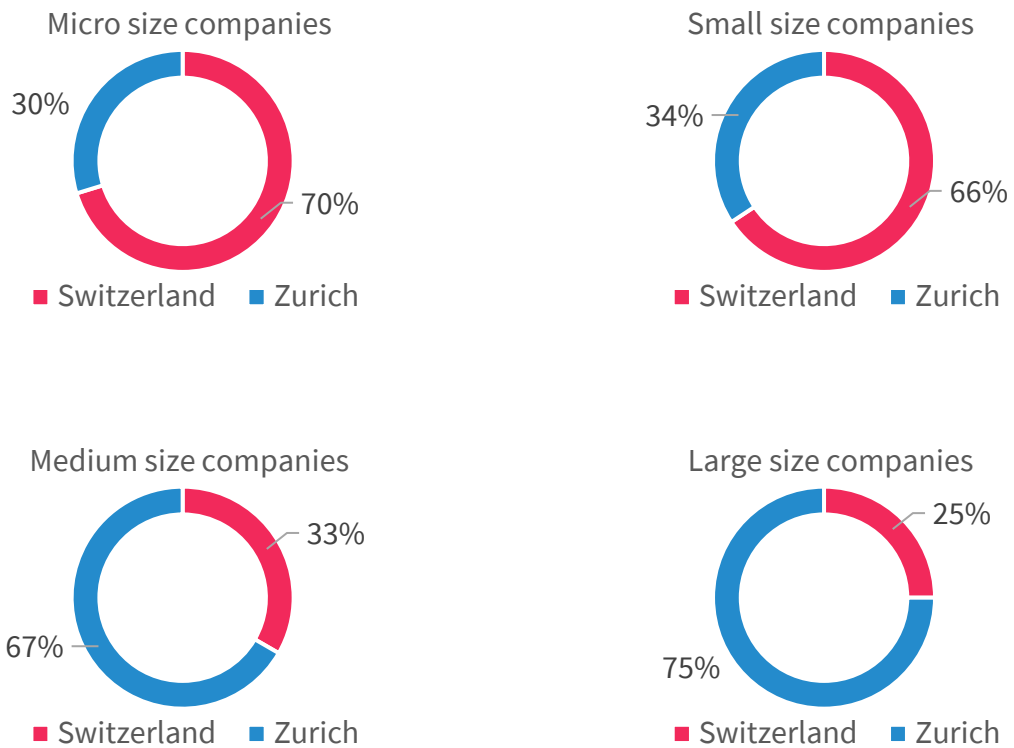
Establishing: Achieved great growth that can be expected to continue strong. No longer need to „try" to get resources and can get them easily.

The size of PropTech companies in canton Zurich



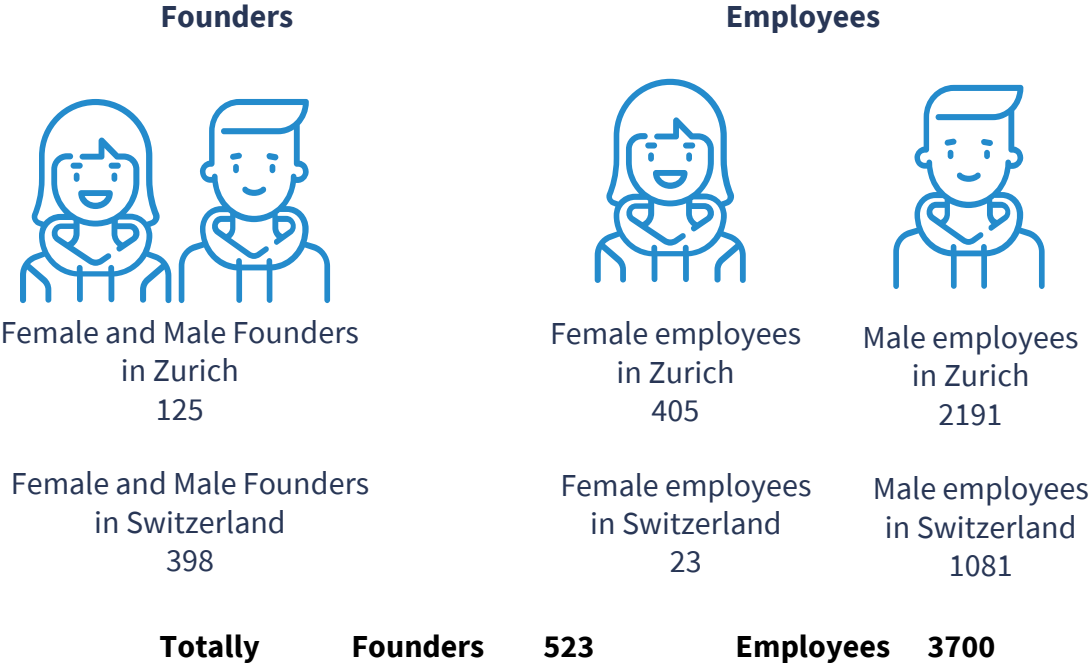
Source: PropTech Academy, PropTech Switzerland, 2021

The comparison between Switzerland and Zurich according to the size of companies

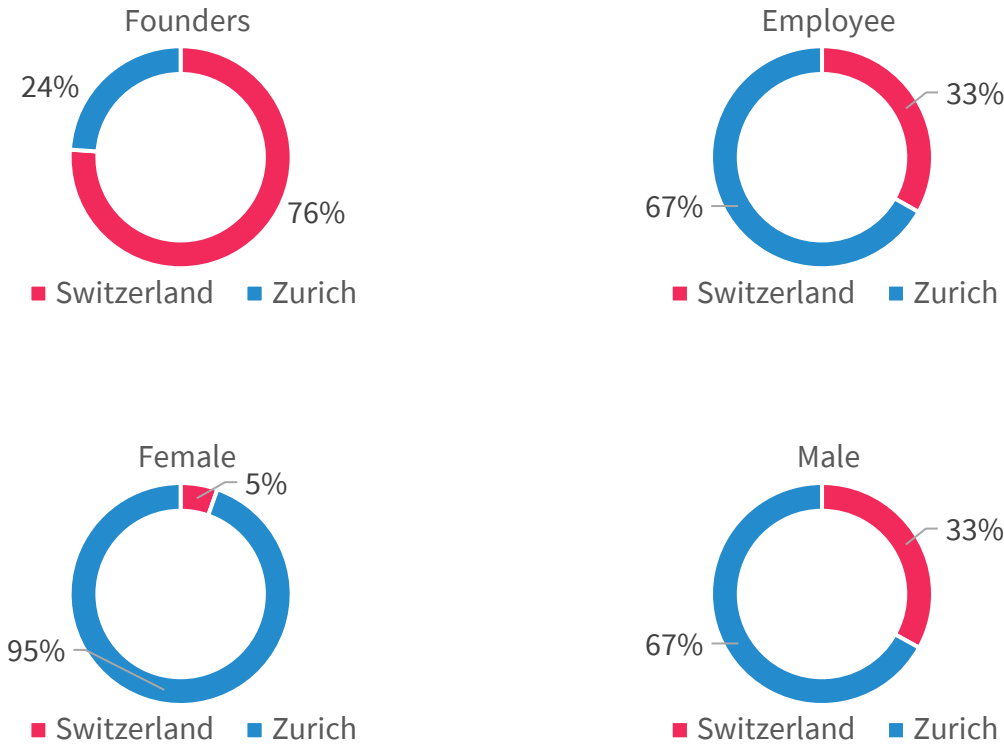


Source: PropTech Academy, PropTech Switzerland, 2021

The statistics of the founders and employees in canton Zurich and comparison with Switzerland



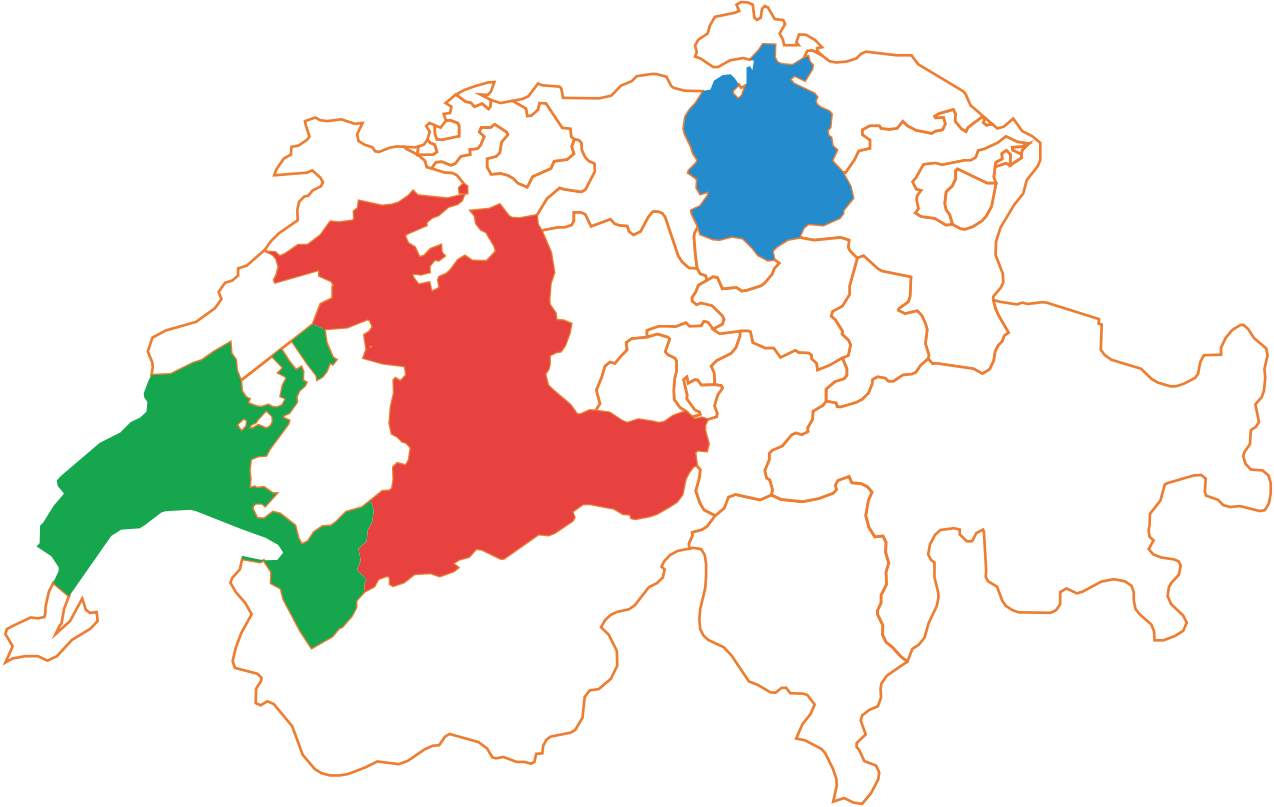
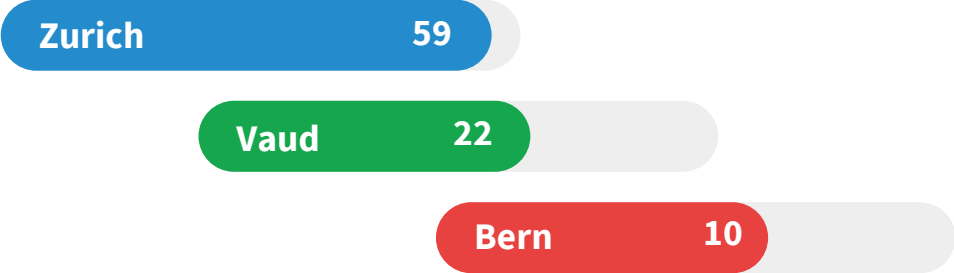
The comparison between Switzerland and Zurich according to the numbers of founders and employees



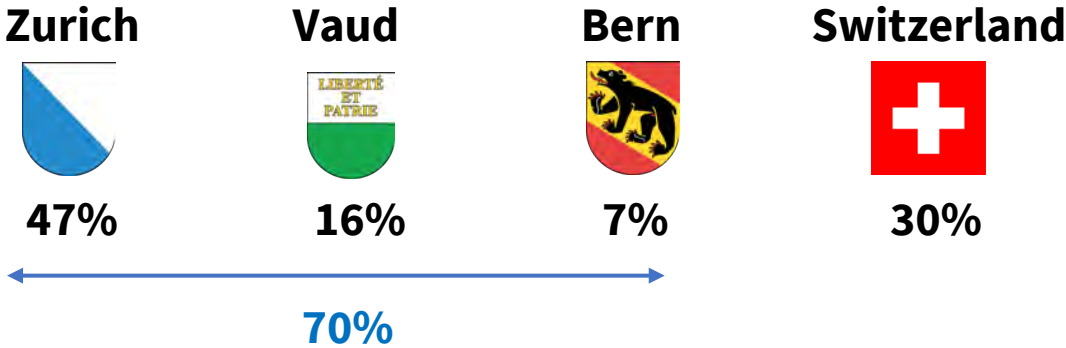
Source: PropTech Academy, PropTech Switzerland, 2021

The comparison between Zurich, Vaud and Bern

The numbers of companies and the market share of three cantons in the PropTech market. Canton Zurich dominates the market, and Zurich is the leading city in technology and innovation.



Swiss PropTech Market Share



Source: PropTech Academy, PropTech Switzerland, 2021

INNOVATIVE
COMPANIES

PropTech

Data Empowerment for Real Estate Decision Makers

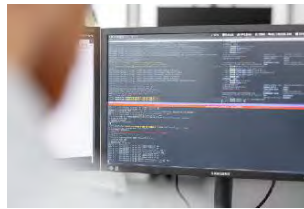
Archilyse makes architecture and real estate quality digitally and objectively measurable, comparable and understandable for everybody. Based on data analytics and objective indicators we provide holistic, qualitative insights to enable new business models and optimise processes all along the real estate life cycle.

SOLUTIONS



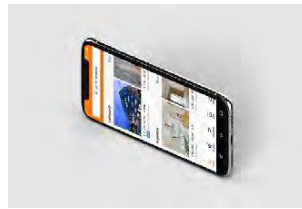
Asset & Portfolio Managers
Real Estate Valuation

2-4% portfolio-wide revenue increase and vacancy reduction led by an improved rental price valuation accuracy.



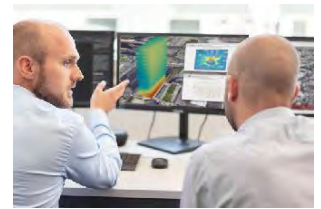
Developers, Planners & Architects
Floor Plan & Norm Check Automation

2 minutes instead of 2 weeks for automated compliance checks against building standards and regulations, plus objective comparisons of planning variants.



Platforms & Marketplaces
Search & Targeting Enhancement

Increased customer satisfaction for apartment seekers by enrichment of search parameters and high-quality simulations. Targeted marketing of properties.



CRE & Workplace Consultants
Workplace Analysis & Optimisation

Optimised office concepts through layout analysis and comparisons via generative floor plan design.

By measuring real estate qualities we unlock powerful insights and enable you to boost your profits. Our AI-supported API allows to automate manual tasks that could not be automated until now. We ensure data homogenisation that is still missing in the digitisation of real estate. Archilyse helps decreasing costs by a factor of 10 and weeks of waiting into seconds.

Get in touch to unlock the hidden potentials of your real estate

sales@archilyse.com,
+41 (0) 44 633 09 94

INCREASED REVENUE WITH BETTER BUSINESS DECISIONS

Archilyse makes architecture and real estate quality measurable, comparable and understandable for everybody. We provide you with object and address-based performance indicators to empower you to make insight-driven decisions. We provide holistic, qualitative insights and support real estate decision-makers in digitising, evaluating and optimising properties and in simplifying processes in the planning and management of real estate. Unique simulations provide in-depth understanding of an object's quality in terms of position (sun, views, location, noise) and functionality (floor plan quality). All digital, all automated, saving cost, time and CO2-emissions.

SCALING UP PROCESS EFFICIENCY WITH DIGITAL AUTOMATION

Archilyse links interwoven exterior and interior property qualities to derive simulations and analyses of a property's view, room functionality and flexibility, possible interior layouts, distances and travel times as well as view, noise and light conditions in high detail. As a result, planning variants or properties in real estate portfolio can be compared objectively, based on clear indicators. Property values can be better estimated, and each property can be marketed based on enhanced targeting criteria.

ABOUT ARCHILYSE

Archilyse AG was founded in 2017 as a spin-off of the renowned ETH Zurich. Founder and visionary Matthias Standfest acts as CEO, an international team of experts bring the solution to live and to market.

With a strong scientific basis, Archilyse maintains close working relations with universities such as ETH Zurich, Bauhaus University or Graz University of Technology to include top-notch research results into our product.



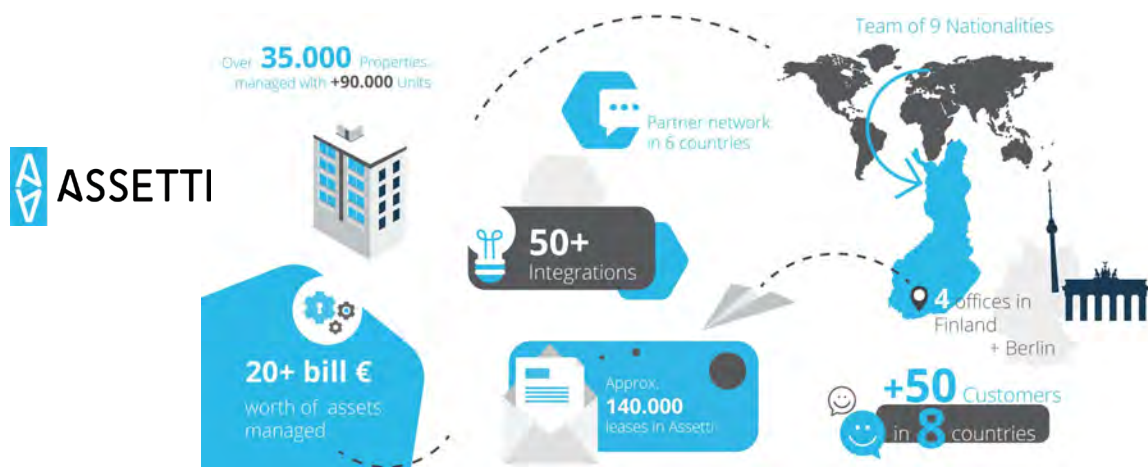
Archilyse AG Technoparkstrasse 1 | Postfach 8005 | 8036 Zürich, archilyse.com

Assetti - Digital Property Asset Management

Assetti is a fast-growing company from **Finland** with a mission to digitalize Property Asset Management. Founded in 2013, Assetti has by now **over 50 customers in 8 different European countries** including Finland, Germany, Denmark, Norway, Sweden, Netherlands, Austria and Switzerland.



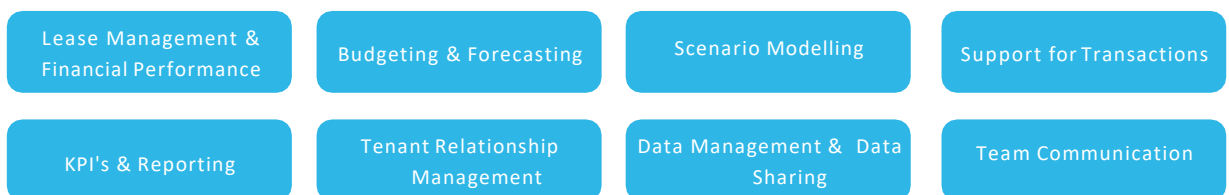
Assetti offers real estate investment professionals a modern tool for managing and reporting portfolio, property asset and tenant relationship information. The tool unifies easy usability, visualisation of information and the latest technologies.



Assetti is an online Property Asset Management solution for Asset Management Professionals. It is easy to use, has a clear visual design and brings **all property-related data together into one application**. An intuitive and responsive user interface allows users to browse and retrieve information regarding portfolios, properties, leases and contacts anytime, anywhere with any mobile device.

With Assetti's advanced search function as well as sort and filter options it is possible to extract actionable data in an instant. The Key performance indicators (KPI) are visualized from your data to get faster insights.

Assetti Feature Set:

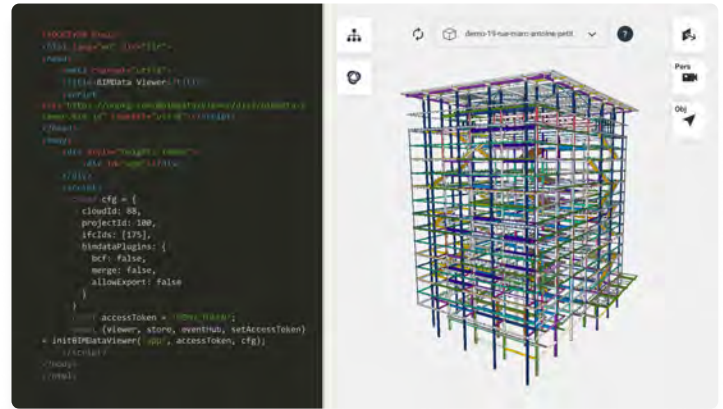


BIM Infrastructure for smart projects

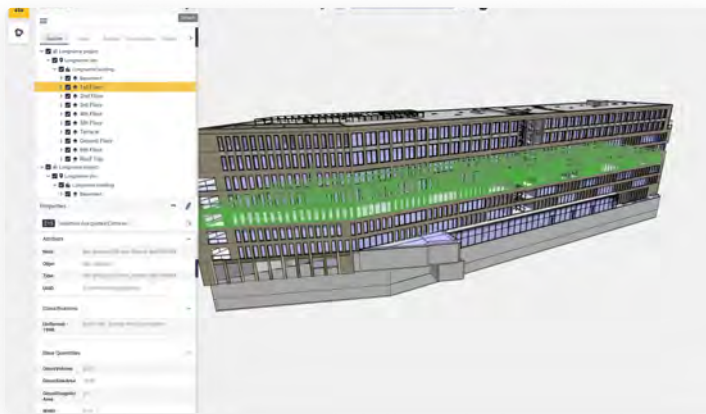
Hundreds of businesses of all sizes—from startups to large enterprises—use BIMData’s tools and APIs to integrate BIM model into their ecosystems.

A technology-first approach to BIM:

- High performance **Viewer** (2D/3D)
- Restful **API** with **SDK** and **Design System**
- Collaborative **Open Source** platform



Fully integrated suite of BIM Techno



We bring together everything that’s required to integrate BIM models into your exiting information systems. BIMData.io’s products power design, construction and O&M softwares and provide state of the art collaborative platform and marketplace.

Why BIMData ?



Fastest improving BIM Tech

Features and improvements are released each week to help you stay ahead of industry shifts.



Direct integration

Integrate high performance 2D and 3D viewer and powerful APIs within few line of codes.



Battle- tested reliability

Our systems operate with 99.9% uptime and are highly scalable and redundant.



Data Protection

BIMData services are hosted on **European Servers**. We also offer the only **BIM On-Premise** solution on the market.




Brixel Deck

An empowering marketplace for smooth transactions of homes.

Thanks for sharing with care.

Customer experience

Fair offering & services

Fair
„Very efficient & transparent service model – can be recommended when you plan to sell your private property.“



Brixel Admin (Business Software)

- Client & property management CRM
- All data and documents in one place
- Direkt listing export to portal via API



Customer experience



Empowering tools & guidance

Empowered
„The web presentation including the 3D tour took place quickly with an excellent result and addressed many interested parties.“

Customer experience

Smooth transaction

Smooth
„The support from Brixel saved us a lot of time, the sales documentation including an online 3D tour was excellent.“

Brixel
2021



Packages
(Modular, fair & transparent pricing)



Service
(High standard personal service & digital excellence)



Client Software
(All-in-one platform to guide you through the process)



Business Software
(Full suited broker CRM used also by B2B clients)

CROWDLITOKEN – the digital real estate asset

CROWDLITOKEN AG is a Liechtenstein Fintech company that provides investors with access to a European real estate portfolio starting at 100 CHF/EUR/ETH. It is based on real estate-linked security tokens - called "CRTs" - which correspond to a digital representation of a bond and yield between 5-7%. The bond combines the advantages of direct and indirect real estate investments and the distribution is possible by the FMA and FINMA in the EEA area and Switzerland.



Digital bond with FMA approved prospectus



Backed by a real estate portfolio

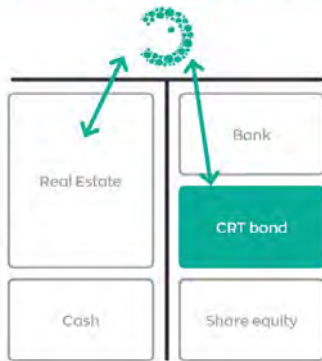


Minimum interest rate rising from 0.875% to 2.1%



Minimum repayment at maturity CHF 0.70 CHF

Balance Sheet CROWDLITOKEN AG

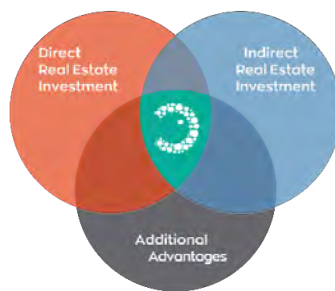


- 50 to 60% debt capital
- CROWDLITOKEN is the owner
- Purchase in CHF, EUR or ETH
- Digitized revenue streams
- Investors benefit from net income & increase in value

Our **mission** is to democratize real estate investments and thus make them accessible to small investors as well. We simplify processes, attach great importance to transparency and, with our innovative real estate portal, have created a simple and uncomplicated way to invest in high-quality real estate completely digitally.

Our investors benefit from the advantages of direct and indirect real estate investments:

- Individual real estate portfolio
- Inflation-protected return (5-7%)
- No agios
- Value appreciation



- No effort for search & management
- Tradable
- Prospectus approved (FMA Liechtenstein)

- Lower costs than existing real estate products
- Flexible adjustment of the real estate portfolio
- No withholding tax

We use new technologies!

The innovation: Thanks to blockchain technology, we can eliminate intermediaries such as banks. Assets are held on the blockchain and custody accounts are eliminated.





REAL ESTATE TOKENIZATION - WHY?

At the time of writing, the financial industry is seeing a very significant trend in the growth of tokenization projects and tokenization solution and services providers. DigiShares provides a primary issuance platform that supports ongoing corporate management of the real estate fund, as well as trading via the built-in OTC marketplace. Other companies provide secondary trading exchanges for security tokens, custody solutions, legal services, etc. Many different pieces of the security token puzzle are now falling into place to form a more efficient, transparent, and secure blockchain-based infrastructure for securities transfer, settlement and trading.

Real estate is the biggest single asset class where tokenization can provide value – \$228 trillion in total assets. The real estate market shares the value proposition of the overall securities market. We view some of the biggest benefits to real estate tokenization to be the ability to reduce ticket sizes by several orders of magnitude (from USD 100,000 to USD 1,000). This is made possible by the extreme automation of issuance and post-issuance processes, and it will dramatically increase the group of investors able to invest in a given fund. Another significant benefit is the new liquidity of real estate by making real estate assets tradeable. This will increase the amount of money available to invest in real estate, and on the other hand, will make the asset class more interesting for investors.

TOKENIZATION OF REAL ESTATE - BEST PRACTICES

This document will describe in detail how and why you should tokenize real estate, and the DigiShares approach for this.

Contents:

➔ **Real Estate Tokenization –Why?**

➔ **The DigiShares Platform**

➔ **Real Estate Tokenization Processes**

Real estate assets have some properties that lend themselves nicely to STOs – such as being relatively secure investments, requiring significant investment sums, being relatively easily comparable and quantifiable, as well as being notoriously illiquid investments.

The real estate market will as such benefit from the “standard” blockchain value properties such as:

1. the ability to automate and reduce the cost of issuance, transfer, settlement and trading processes,
2. the ability to automate and reduce the cost of governance processes such as cross-border transfers, cross-investor-type trading, lock-up periods, caps on investor counts, etc.,
3. the subsequent increased ability to engage foreign investors and larger numbers of (smaller) investors thereby increasing the pool of investors for any given project,
4. the ability to reduce or remove different types of intermediaries such as CSDs, transfer agencies, broker-dealers, etc. due to the blockchain trust layer thereby increasing efficiency and reducing cost further,
5. the increased ability to attract investors due to the previously mentioned benefits (additional liquidity), and
6. the ability to significantly reduce ticket size of investors by an order of magnitude to cater for retail investors due to the automation of processes

We will therefore see that *good projects can raise capital easier, faster and at a reduced cost*, investors will enjoy increased liquidity on their investments, good projects will get a liquidity premium, and investors will globally get access to previously inaccessible types of investments..

Further reading:

DigiShares real estate blog articles: <https://digishares.io/contact-real-estate>

DigiShares CEO presentation on real estate tokenization: <https://www.youtube.com/watch?v=7nx9Xzernrc>

Tokenized Securities & Commercial Real Estate: <https://mitcre.mit.edu/wp-content/uploads/2019/11/Tokenized-Security-Commercial-Real-Estate2.pdf>

For some years now crowd-funding platforms have offered access to invest and trade “digitized” real estate assets. Why is tokenization better? For two main reasons. The “old” crowd-funding platforms are siloed and not interoperable globally.

The global tokenization industry will use the same standards such that tokenization platforms on different continents will be interoperable. This means that real estate tokens issued by DigiShares will be tradeable on exchanges in the US, Europe and Asia. It also means that tokens issued by DigiShares can be kept in safe custody by most security token custodians globally. Finally, it means that no investors or issuers will be locked into a single vendor’s ecosystem but will be able to transfer their tokens for trading or custody to any other vendor globally (only limited by regulatory restrictions). The other reason is that blockchain technology is a much more modern, secure and efficient method for implementing securities transfer, settlement and trading compared to proprietary digitization of securities.

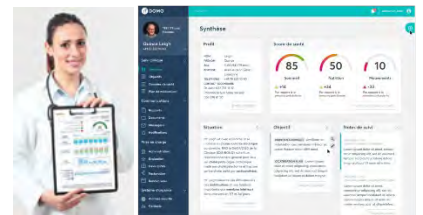
Follow us on





Leading digital health in home care

DOMO home care services allow patients living with chronic conditions to stay at home as long as possible enjoying a good quality of life. The artificial intelligence of DomoSafety can detect worsening of health conditions in mental health or cardiovascular issues enabling preventive care thus avoiding hospitalization and extra health costs. Using behavior and vital signs data, our machine learning techniques automatically informs the healthcare eco-system surrounding the patients providing a substantially increased level of safety and prevention at lower cost. Combining the best of digital health tools and global, outstanding experience with health care professional skills brings efficient, personalized and preventive services in the home care process.



An health platform with 2 services

Emergency services with call center 24/7 rescuing the elderly persons in case of a fall or social isolation

Healthcare services with home care health professionals monitoring the health and informing the healthcare ecosystem in case of change of behavior

We sell SaaS licenses to home care organization and subscriptions for users of the solutions. They package our services within their home care services.

Benefits

24/7 hour security with alarm button and automatic fall detection

Monitoring for 6 essential health indicators: activity, mobility, heart rate, respiratory rate, sleep quality and changes in routine

Monthly health report shared with healthcare professionals

Information to loved ones and the emergency call service

Free mobile app to communicate with different services and be informed in the event of an emergency by our emergency call service

Innovation

The business model is adaptive as our customers can choose between white label models, reselling our offering with commissioning or adapting our solutions to their needs. We have learnt from B2C in Switzerland to scale internationally in B2B.

We save lives as we detect emergency situations automatically based on personalized routines.

We help to avoid or postpone the entry into hospital using preventive care thanks to our predictive AI models; Thus decreasing public health costs

Efficiency

By sharing longitudinal health information with home care providers and sending notification when health deterioration has been detected, we help the healthcare professionals to apply preventive and personalized care. Understanding the health risks withing a population of seniors or patients suffering of chronic conditions allows to bring more efficiency with the healthcare professionals.



DomoSafety SA:

Incorporated: August 2012

Phase: international growth

Employees: 15

Headquarter: EPFL, Lausanne

www.domo-safety.com

Contact person:

Guillaume DuPasquier

CEO & Co-Founder

guillaume.dupasquier@domo-safety.com

+41 (0) 58 800 58 00

Swiss Federal Institute of Technology Lausanne (EPFL)



Droople and the Internet of Water

Droople is a Swiss cleantech building the Internet of Water. The company develops innovative IoT solutions for intelligent water assets management digitizing 36+ billion water-based assets, “off radar” today, all around the world. By connecting sanitary ware, water treatment systems and appliances, Droople delivers real-time insights at any point of use. Its AI-enabled systems allow customers to accurately measure and analyze their water assets to monitor them, predict their maintenance and unlock water and energy savings.



Droople's Smart Solutions and Water Intelligence Platform gives the power to accelerate the adoption of sustainable practices, promotes the integration of water conservation systems and the value of this essential resource.

Swiss Water Intelligence Platform

Droople offers turnkey water monitoring solutions designed for a wide range of water assets such as water treatment systems, appliances, and sanitary ware, to offer dashboards, asset analytics, forecasting, audits and much more.



The Droople full-stack IoT solution includes intelligent devices, such as the edge-computing module iLink® (patent pending), able to read analog or digital sensors covering a wide range of metrics, including flow, temperature, pressure, hardness, pH, chlorine and others. Smart devices connect via fully encrypted, high-resolution, ultra-low power wireless communication to the Droople cloud platform, featuring AI-based algorithms, to provide an immediate dashboard access to actionable insights.

Understand. Value. Manage.

The Droople solution is specifically designed to easily retrofit any kind of water asset and enables plug-in monitoring capabilities. The key factor for the democratization of this unique water monitoring solution is the SaaS (Software as a Service) business model focused on providing added-value insights through the Water Intelligence Platform. Hardware modules are provided for free, as enablers of customer data access. Tailored and evolutive subscription conditions (one to five-year plans) are designed to guarantee the scalability, flexibility, and full customization of the monitoring solutions.

Droople's advanced digital solutions allow to boost efficiency and to reduce operational costs for vendors, distributors, and service providers of the water-driven assets, bringing invaluable benefits:

- Optimize the resource allocation and equipment maintenance costs by 20-30%
- Preserve the highest water quality, and offer transparency of water consumption
- Boost the service efficiency, achieving a 30% reduction of unplanned interventions
- Automate the supply chain, eliminating manual order processing for products and consumables, and maximizing asset lifetime
- Enable pay-per-use service models leading to significant water and energy savings.

Droople Water Intelligence Platform - unleash Swiss made precision of a drop!



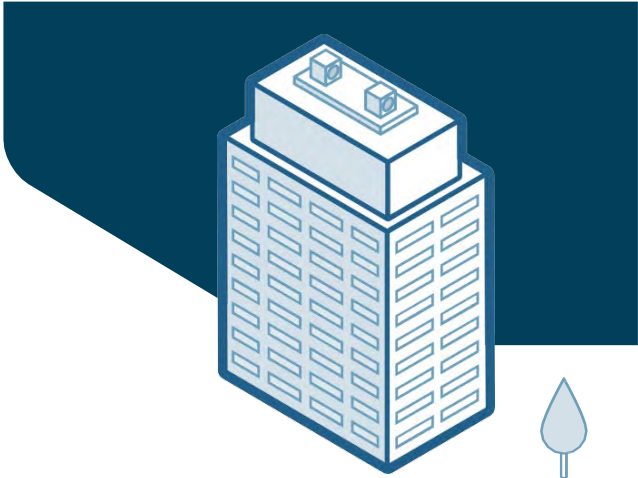
www.droople.com



contact@droople.com

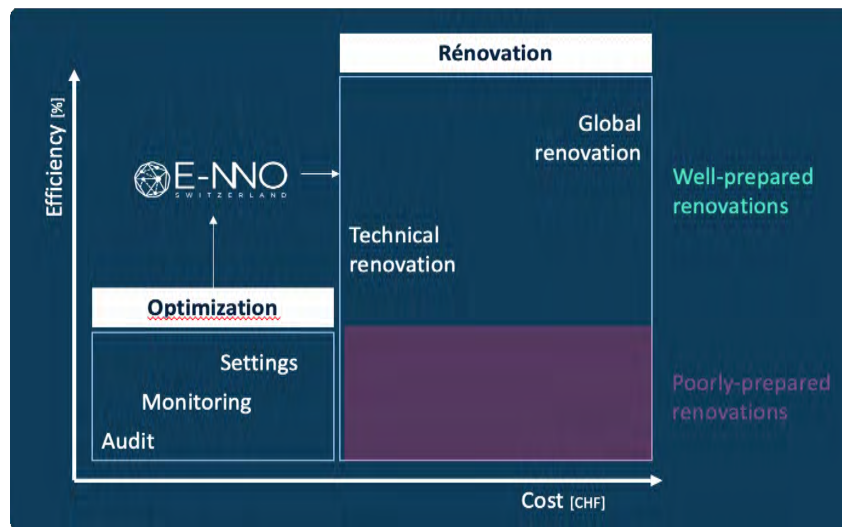
This company has been certified with International PropTech Innovation Label by PropTech Academy Association and it has worldwide validity. Certificate No.: PPI / 600005 - Certificate Date: 10.03.2021 - Expiry Date: 10.03.2022 - Switzerland

Data driven solutions that increase energy efficiency and reduce real estate's environmental footprint



E-nno is a swiss start-up that offers to quickly achieve energy savings and to capitalize on the data collected to better prepare future renovation work. Thanks to the «Pay as you save» business model, the optimization service is covered 100% by the energy savings and the return on investment in two years on average.

When owners wants to carry out measures to improve the energy efficiency of his building, they must go through several steps that can take up to 5 years before realizing energy savings. In the case of renovations, if the work is poorly prepared, the results are uncertain and generally do not achieve the expected performance.



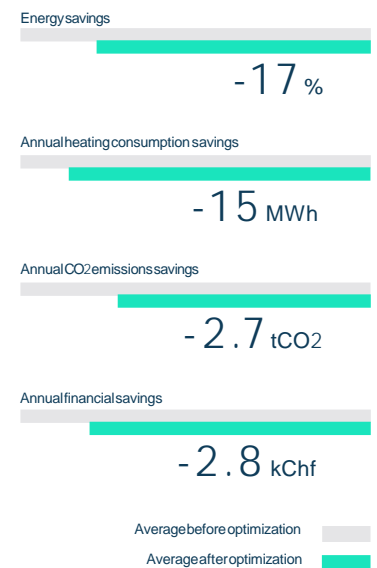
Installed in half a day and 100% suitable, the technology and its algorithms allows to quickly reduce the energy expenses and consumption of the building autonomously. It also allows to monitor the building's consumption in real time, detects the malfunction and warns the technicians automatically. Securely stored and Swiss Data Hosting labelled, datas are property of the customer and allow to prepare at best the future renovation works and certify the savings afterwards.

The low cost of the installations compared to the subsequent savings allow the customer to realize a quick return on investment. The «pay as you save» business model applied to the optimization service means that the customer is not charged until savings are realized. In return, E-nno receives a percentage of the savings made in order to continuously improve its algorithms and to develop services adapted to the needs of the customers.

- ✓ Up to -40% CO₂ emissions
- ✓ Up to -30% in energy costs
- ✓ Helps to meet ESG objectives

Averages key results per building*

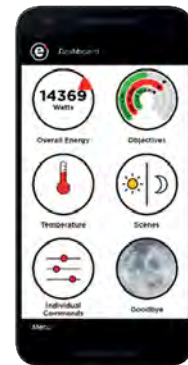
*On the currently optimized buildings



eSMART develops intelligent systems for building automation to enhance living comfort and safety while allowing residents to monitor and reduce energy consumption.



eSMART-touch for remote control

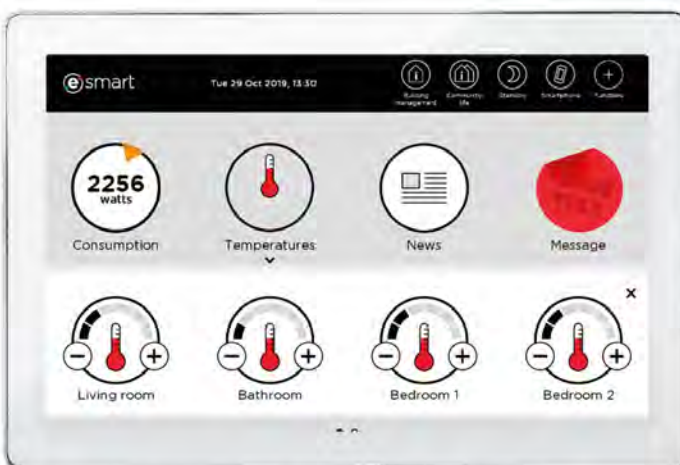


A free Smartphone application for remote control

Via a touch screen on the wall or from the Smartphone app, building functionalities such as videophone, heating, lighting or blinds can be centrally controlled. The screen also displays the consumption of energy incl. heating and hot water in real time, informing residents about their energy consumption

eSMART's digital solution also contributes to reducing property management costs and increasing efficiency by providing the property manager access to consumption data and the ability to communicate with occupants about activities and information in the neighbourhood.

eSMART originated at the Swiss Federal Institute of Technology in Lausanne and was founded in 2011



Independent heating setting of rooms



Videophone for secure access control

Rental Management Software

«A web-based ERP for landlords and property managers, connecting the PropTech Eco-System and establishing a marketplace for products and services»



Contracting

Easy contract creation and management
Ready to use templates for all required documents
Indication for vacancies



Accounting

Full double sided accounting
Debitor and Creditor management
Automatic invoicing for rent collection
Export of accounting into Excel



Service charges

Calculation of prepaid expenses
Calculation of accrued cost
Distribution of cost per contract
Automatic invoice creation



Replace or repair

Full inventory of rooms and assets
History of repairs and cost per asset
Damage & repair process

Advantage of web based Software



Seamless & End-to-end



Transparency & accountability



Consistent data, history, access



Open, Scalable, Intuitive



Enable outsourcing & cooperation



Automation & Efficiency Gains

Creating connectivity within the living ecosystem

Huperty is creating a new standard for a networked, comprehensive property management ecosystem with the focus on joint value creation.

Through the platform Huperty, real estate management companies can provide digital services to their private & business tenants as well as condominium owners. Third parties such as asset managers & owners, craftsmen, facility managers or other service providers have been integrated on the platform as well. Moreover, a wide range of digital services and cooperation partners can be integrated with the aim of uniting all parties in one ecosystem.



Problem - inefficient isolated solutions



PROBLEM 1

Lack of uniform, digital stakeholder networking



PROBLEM 2

Repeated collection of the same data due to isolated applications



PROBLEM 3

Little to no automation within real estate management



PROBLEM 4

Lack of transparency within the internal control system and all involved stakeholders

Our Solution



SOLUTION 1

Uniform network of all stakeholders on one platform



SOLUTION 2

Elimination of redundant data through intelligent interaction of the system or connection of third parties



SOLUTION 3

Not only digitalization but also automation of customizable processes



SOLUTION 4

Creation of an unmatched transparency for all participants through defined process steps and evaluation function

What have we got to offer?

Many companies offer property managers an isolated solution that only covers a small part of their daily business routine. The initial idea behind Huperty's ecosystem was to offer real added value not only to the property managers, but also to all stakeholders on the platform. Furthermore, there are no rigid processes behind it, instead every part of the process is modifiable.

We accompany property managers and all other stakeholders on their way into the digital future. Get in touch with us today to get more information and find out how you can benefit from Huperty.



Contact details

www.huperty.ch
info@huperty.ch

Seebacherstrasse 4 +41 44 741 60 60
8052 Zürich





END CLIENT

- profits from the competition and the best price at the mortgage exchange
- receives comprehensive advice and support from a person of trust, his/her advisor of choice
- doesn't have to switch the advisor
- fast and reliable: firm offers within minutes and not days!



ADVISOR / AGENT

- expansion of the service portfolio and can offer even more comprehensive customer services
- generates additional income and can promote cross-selling
- Achieves long-term customer locality and gets/keeps a 360-view of the customer

Conclusion

We enable direct participation in the mortgage market for advisors and agents and we save end clients time, effort and money in securing the best deal in the market.

HYPOTEQ IN A NUTSHELL



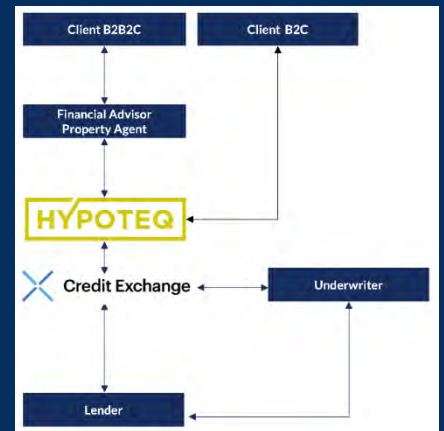
HYPOTEQ connects independent financial advisors and property agents with the largest mortgage exchange in Switzerland, so that:

Independent Financial Advisors and Property Agents

- 1 can provide financing and mortgage advise and keep their clients
- 2 have a software tool that ensures smooth real-time & execution expert advise
- 3 can build up a mortgage book and a new, lucrative business

End Clients

- 1 can compare mortgage offers in real-time onsite/during the meeting with their advisor
- 2 don't have to check the mortgage market by themselves
- 3 can close a deal in 15 mins. and only then have to provide personal data



Contact data:

Christian Neff
christian.neff@hypoteq.ch

Davide Iuorno
davide.iuorno@hypoteq.ch

HYPOTEQ AG
 Industriestrasse 47
 6300 Zug

044 564 73 70

www.hypoteq.ch

info@hypoteq.ch

Mortgages have become comparable – the advisors remain unique



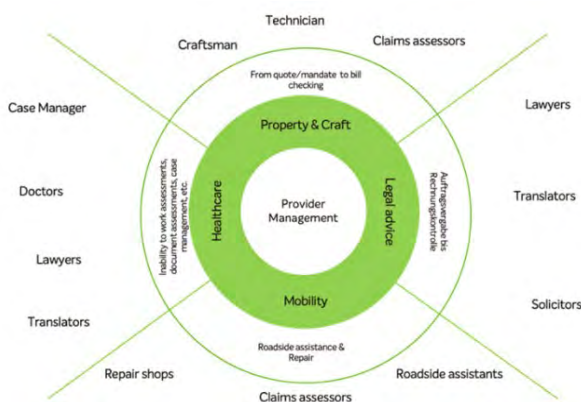
Digital cooperation made easy

JAROWA is a privately founded and financed company. We focus on the needs of insurances, property management companies and administrations, their service providers and end customers (recipients of services, such as insured persons). Our eco-system solutions are recognized as the market standard in Switzerland.

Eco-systems are environments that benefit all interacting parties. At JAROWA we create such digital eco-systems that provide efficient and safe services to all involved partners.

Our eco-systems offer:

- A marketspace for the corresponding businesses,
- A network of trusted service providers,
- End customers embedment and services,
- Digitalization of the order management,
- More orders and fair conditions for service providers,
- Easier and more efficient ordering services for large companies,
- Lower costs and higher customer satisfaction for all involved.



Our approach towards B2B2C bookings is innovative and efficient. We only work with trusted providers who benefit from a much less cumbersome offer process. This again ensures a much more efficient process and automation across the whole journey.

JAROWA offers a very intuitive tool for large companies who want to steer orders (centralized and de-centralized) towards an own trusted network. We enable our clients to centrally manage their network, align processes and automation and to de-centrally execute. The service receiver is embedded into the process and the end customer's happiness is heavily increased. All of our eco-system parties benefit from our networks of trust, fast and secure processes and no tedious tendering. Our providers are all hand-picked and nominated by insurances, property management companies or administrations.

With JAROWA, customers gain efficiencies in many areas, they improve their network management, find trusted service providers, easily manage order bookings and much more. Their processes are automated and equipped with smart algorithms for new approaches and seamless integration possibilities.

More information available on; <https://www.jarowa.ch/>



Lightmove buys your property

The certainty of a quick, discreet and flexible real estate sale.

Lightmove SA is the 1st iBuyer of Switzerland, awarded by the PropTech Innovation Index 2020, and has been created within the EPFL Innovation Park in 2019.

Lightmove SA combines technology, human expertise and access to immediate cash to offer a unique range of solutions for owners selling their properties in Switzerland.

www.lightmove.ch

info@lightmove.ch

+41 21 353 92 10

Lightmove SA
EPFL Innovation Park
CH – 1015 Lausanne

Our solutions

- **FLASH** allows you to sell in 10 days.
- **BRIDGE** allows you to receive an equity advance to purchase your new property before you have sold your current one.
- **FLEX** offers the certainty of selling at a future date and the freedom to cancel before the closing date.

Your advantages



The certainty of selling



Sell in 10 days



Maximum comfort



Flexible key collection date



Absolute discretion



A sale adapted to your needs





Matterport™

Matterport has been leading the digital transformation of the built world - a \$230 trillion asset class - for a decade. Matterport's unrivaled software and data platform allows customers to accurately and efficiently digitize physical space -- and the company is only just beginning to tap its massive, unpenetrated \$240 billion addressable market.

We have created what we believe is the largest spatial data library in the world, with more than 10 billion square feet of space and growing. Millions of buildings in more than 150 countries have been digitized, from homes, office spaces, museums and schools to factories, hospitals, and retail stores.

What values or benefits are created for your customers?

The combination of digitization and datafication is extremely beneficial for our customers. From the early stages of design and development to marketing, operations, insurance and building repair, our software provides customers critical tools and insights to drive cost savings, increase revenues and optimally manage their buildings and spaces.

TALON **ERICSSON**

Global infrastructure services contractor utilized by industry leading communications providers

AT&T Tech Mahindra verizon

Why Matterport?

- Digitizes costly, slow, and inefficient site survey process
- Delivers measurement data accuracy within 20mm
- Open architecture enables frictionless integration with Talon's proprietary software suite (TalonView)

Current Use Cases

- Construction
- Equipment Design & Installation
- Facilities Management
- As Built Documentation

Expansion Over Time

60% Bookings Growth

2019 2020E

CUSHMAN & WAKEFIELD

Global commercial real estate services firm with comprehensive offerings for owners & occupiers

\$9B Revenue 53K Employees 400 Offices 60 Countries

Why Matterport?

- Unrivaled spatial data and virtual model fidelity
- Global Scalability across North America, Europe, and Asia Pacific
- AI powered, future-proof platform capabilities

Current Use Cases

- Virtual Walkthroughs
- Spatial Data Capture Services
- Building Due Diligence

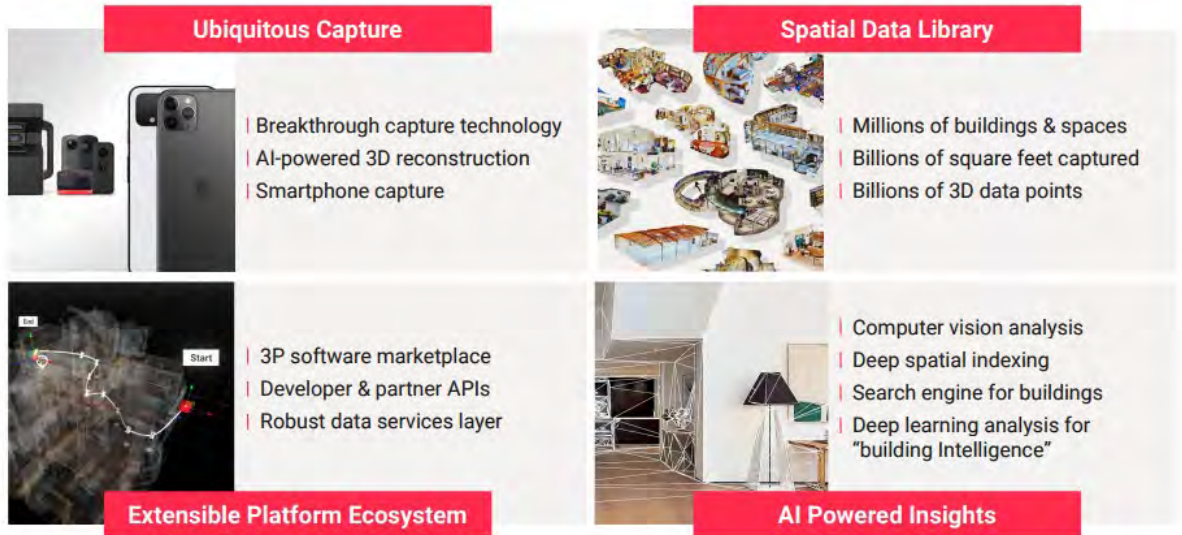
Expansion Over Time

26x+ Bookings Growth

2018 2019 2020E

Why is your business model innovative?

Matterport's pioneering technology has set the standard for transforming buildings into data and they continue to raise the bar for the future. Their unrivalled spatial data library has proven to be a durable and evolving competitive advantage, taking property insights and analytics to new highs.



Which problems have you been able to solve with your business model?

The Matterport spatial data platform delivers value across a diverse set of industries and use cases. Large retailers can manage thousands of store locations remotely, real estate agencies can provide virtual open houses for hundreds of properties and thousands of visitors at the same time, and property developers and insurance companies can more precisely document and assess the construction process every step of the way with greater speed, efficiency and precision. Matterport delivers the critical digital experience, tools and information that matter to our customers about properties of virtually any size, shape, and location worldwide.

Where is there an increase in efficiency?

Matterport delivers value across the property lifecycle for diverse end markets



...taking property insights and analytics to new heights

Analyzed by Matterport and 3P developers to deliver high-value property insights unlike anything before

Spans buildings, cities, and countries to unlock previously unattainable industry-wide trends & insights



Case Study:

Colliers International Closes Deals Faster with Matterport

Global commercial real estate company chose Matterport Capture Services to create immersive 3D tours of properties, allowing clients to explore what's for sale or lease without an appointment or the costs and uncertainty of travel.

Results

- Increased buyer interest and marketing of higher-quality leads
- Helped clients secure small business loans faster and consult designers to transform spaces
- Increased site visits by 30% and reduced service costs
- Accelerated decision-making and time to contract



Case Study:

Savills Shows Properties Efficiently and Remotely with Matterport

Global commercial real estate firm uses Matterport to create powerful 3D virtual tours of commercial real estate to connect tenants to the best properties in their local markets.

Results

- Reduced backlog of 3D scans with Matterport Capture Services
- Enhanced digital marketing experience
- Decreased physical site visits
- Direct clients to commercial spaces in hours vs. days



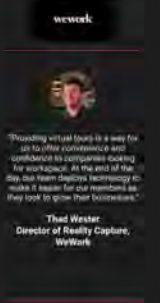
Case Study:

WeWork Uses Matterport to Show Potential Workspaces to Companies

WeWork creates virtual tours at scale with Matterport for design, construction, and operational phases of a WeWork buildings.

Results

- Scanned 642 locations or 118 sites around the world
- HRIS business leaders evaluate a WeWork space without travel
- Previews AEC teams digital views and print clouds within 72 hours
- Streamlined workflow for any surveys, BIM, and clean deliveries



Case Study:

Engel & Völkers Enjoys Record Revenue During a Crisis Year

Global luxury real estate brand experiences a 30% increase in revenue with Matterport.

Results

- Increased buyer confidence with 24/7 access to immersive tours
- Accelerated decision-making
- Reduced physical site visits and related costs
- Provided remote, immersive and long time-consuming experiences to clients



Matterport International PropTech Innovation Label

Matterport Inc. was being audited according to the PropTech innovation evaluation process and it has been confirmed that the company meets the respective innovation criteria.

Talents Innovate

This company has been certified with International PropTech (Innovation) Label by PropTech Authority Association and has worldwide validity. Certificate No.: IPH / 000001 / Certificate Date: 04.02.2021 / Expiry Date: 04.01.2022 / Switzerland

THE REAL ESTATE AGENCY ON THE RISE

The Neho business model

Neho is the first real estate agency without commission in Switzerland, allowing property owners to save tens of thousands of francs. With fixed fee offers, Neho provides a unique combination of tech-based processes and human expertise to deliver an unparalleled breadth of service in the market.



Neho increases efficiency by automating all administrative tasks while eliminating many unnecessary costs such as paper-based processes or physical offices for example. This allows Neho to offer an extremely competitive package price, and to focus on what is most important: The service to the client.

By supporting the agent's work through digitalization, Neho can :

✓ Value properties at the right price

✓ Offer the **best value-for-money ratio** in the real estate brokerage market

✓ Sell faster, through automated processes

✓ Generate a big volume of buyer leads, through wide-spread publication

✓ Monitor buyers' interest, by analysing their online behavior

✓ improve selling rates by constantly measuring the traction of a property on the market and reacting accordingly

Neho keeps the **human relationship** at the core of its service, with local experts present all over Switzerland, providing a tailored 1-on-1 service to sellers from the appraisal of the property to the closing of the sale.

neho

The rise of the online real estate portals through which 98% of transactions are initiated, drastically changed the role and added value of real estate companies. In addition to this evolution, the cost for sellers constantly increased over the past 20 years, due to real estate price increases - while the service in the market has not evolved. Neho, established its business by adapting its offer to the new realities of the market and aims to offer a more fair, transparent and straightforward brokerage service with the help of digital technologies.

With its fixed-fee model, independent of the value of the property, Neho allows homeowners who considered broker services as not performant enough and too expensive, to benefit from a **professional expertise and dedicated support**, to sell effectively, at the best possible price and paying only a fraction of the cost of what a traditional agency would charge for the service.

Since launching, Neho helped hundreds of customers save more than 30 millions francs of commission.

Neho it is...

Fixed fees starting at
CHF 9'500

60+
employees

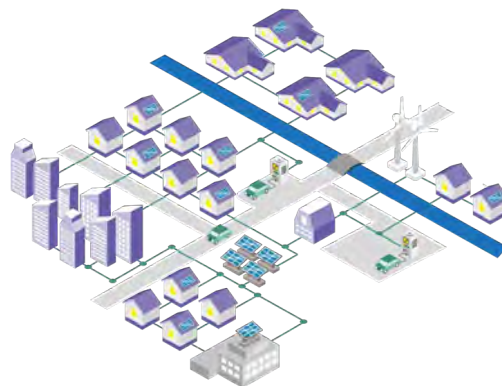
1'500+
customers

30M+
saved in commission

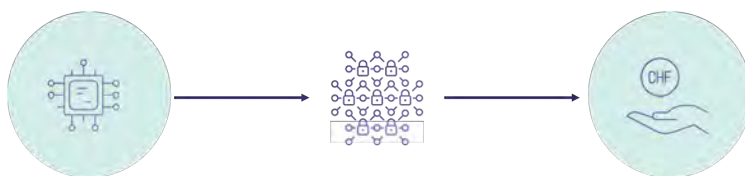


The challenge

The real estate sector is facing new challenges. In a changing world towards decentralized and clean energy the market requests sustainable smart buildings. With the expansion of IoT devices in Smart Buildings, the need for intelligent business solutions such as real time billing grows. Moreover, the EU now requires property owners to bill their energy on a monthly basis for all new constructions with the aim to enhance transparency for consumers. However, administrating this billing process is highly complex and processes are non-transparent for residents & property owners.



The radically digital solution



The Ormera Platform

Ormera takes care of the whole Smart Building Billing process - automatically, transparently and reliably. Utilities, energy service providers and property management firms use this meter-to-cash solution as a white label product. In an intuitive dashboard, tenants keep track of their consumption at any time and can, thus, optimize it. Moreover, they can choose their desired payment method and pay their bills conveniently. By billing any IoT-device, this platform can be used for entire smart cities integrating also heat or water billing, e- mobility or battery storage.

The complete digitization of the process from measuring up to billing is unique. Ormera connects any IoT device with the highly secure blockchain technology. By doing so, it cuts administrative costs drastically. The intuitive dashboard displays all production and consumption data and makes the property's energy resources transparent. By offering this simple meter-to-cash solution to a new challenge that self-producers face, Ormera makes an important contribution to the energy transition.

Our mission

is to create global simplicity for local renewable energy production.





Parquery's first solution provides real-time parking guidance to an available parking spot. Customers currently request additional solutions such as bus parking, truck parking, boat parking, train parking, plane parking, seat occupancy, people counting and warehouse management. After four years of technical work, Parquery's object detection pipeline is now robust, scalable and 80%-automatised: we can therefore afford to answer these requests without losing focus

Parquery sells a service to customers in a niche: large outdoor car park managers, e.g. Airports, Real Estate, Retail, Leisure Parks, Convention Centers, Universities, Hospitals, Employee Car Parks, Cities,...

Benefits

Parquery's end-customers are parking and facility managers, who mostly have the following needs

- They wish to **display available parking spots** to their customers (e.g. retail, airports, corporate parking lots, etc.)
- They would like to **identify if a vehicle stays longer than authorized** (longer than the maximum duration, longer than what they paid for, is an electric vehicle parked but not charging?, etc.).
- They wish to **understand the usage of their parking area** (e.g. do drivers indeed use all the parking area? when?, etc.)

Innovation

On the market today, the main techniques to monitor space occupancy are:

1. electromagnetic and or infra-red ground-embedded sensors, which can be expensive, inaccurate and require regular maintenance,
2. video monitoring via cameras with onboard computers and dedicated algorithms to analyse occupancy. These cameras are expensive to install and operate.

On the contrary, Parquery:

- a. Analyses any image from any already-installed camera: no additional infrastructure is required.
- b. Provides reliable results (99% accuracy) in all weather conditions. Furthermore, all results are verifiable by customers.
- c. Developed a built-in-house object detection technology which can be deployed locally or on cloud servers, as preferred by customers.
- d. Built a robust technology which can detect any object via very low resolution images: more than 300 spaces can be monitored on only one image for instance.
- e. Has developed a very flexible technology, which can be used to detect any object or silhouette, and create solutions such as people counting in halls or public transport, traffic management or warehouse stock optimization for instance.



Solving Problems

Parquery provides parking managers with **real-time results** to the following questions:

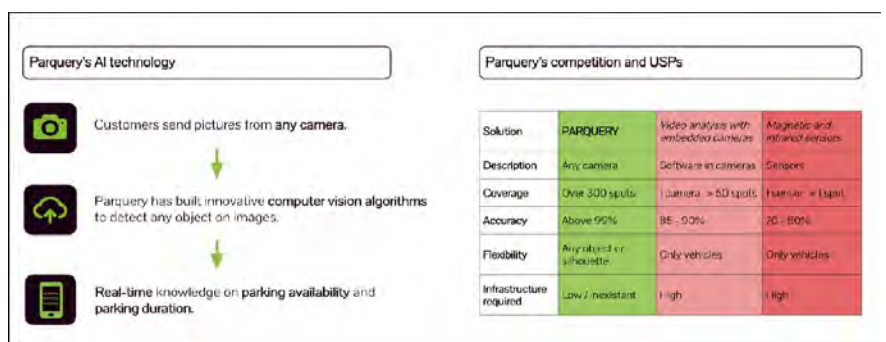
- **Where** are currently available parking spots? **Drivers can be guided to an available parking spot** on a Smartphone App or on dynamic guidance panels. Parquery's API can also be easily integrated into an existing Smartphone App.
- **How long is each vehicle currently parked for?** Are vehicles parked more than 30min? 2h? after the closing time?
- **Are reserved parking spots** (trucks, disabled, electric vehicles, taxis,...) currently used?
- **Are vehicles currently wrongly parked** (in front of emergency exits, on delivery areas, ...)?
- **Alerts can be sent to parking managers.**
- **Which vehicle type** is currently parked? truck, van, car, motorcycle?

Parquery also provides parking managers with **structured analytics and statistics** on:

- **What is the general parking occupancy** of each parking zone? How many parking spots are used? How often? When are peak hours?
- **How long** do customers and visitors stay parked? 5min? 20min? 2h? all day? **How long do customers park on average?**
- **Which car park zones are more often used?** close to the nearby shops? closer to the city centre?
- **Are there bottlenecks / traffic jams?** Where are they principally?

All analytics can be averaged on any time period (every hour, every day, every week, ...) and of any size (only parking spots reserved (handicapped, electric vehicles, ...), only delivery areas, only parking close to the entrance, all parking spots next to the neighbour shop,...)

Efficiency



POPETY.IO

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ACCELERATE YOUR REAL ESTATE PROSPECTING

Digital solutions for real estate professionals

B2B SaaS Solutions



Real estate
Agents



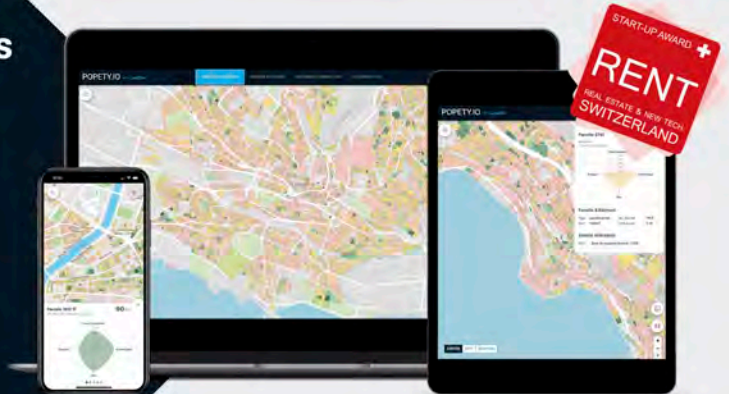
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Developers



Asset
Managers



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Identify high-potential plots of land.

ANALYSE

Access a plot's key information.

SHARE

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Stay informed of situational changes.

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KEY INFORMATIONS

+ 1 Million Plots **330 750** Transactions **190 162** Inquiries

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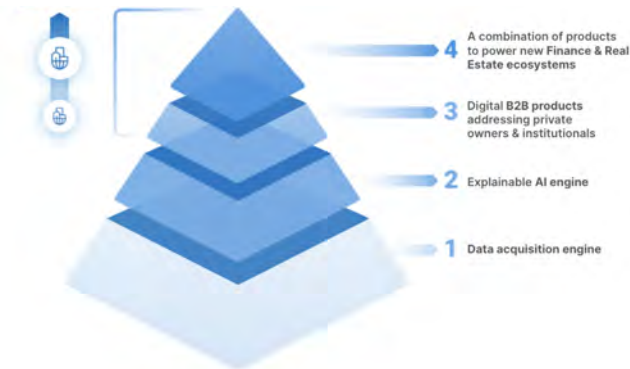
Arthur Debras, Sales Manager
adebras@popety.com
+41 78 220 10 05

We are a global AI analytics & digital Real Estate company

PriceHubble is a Swiss B2B proptech company that builds innovative digital solutions for the real estate industry based on property valuations and market insights.

Leveraging big data, cutting-edge analytics and great visualization, PriceHubble's products suite brings a new level of transparency in the market, enabling their customers to make real estate and investment decisions based on the most accurate data-driven insights (such as valuations, market analyses, value forecasts or building simulations) and enhance the dialogue with end consumers.

PriceHubble is already active in 7 countries (Switzerland, France, Germany, Austria, Japan, Netherlands and Belgium) and employs more than 100 people worldwide.



Our vision: A new level of Property & Market Insights to create and power new Finance & Real Estate ecosystems at scale around the world.

What value or benefits are created for your customers?

PriceHubble's digital solutions are designed to help all players across the entire real estate value chain (banks, asset managers, developers, property managers and real estate agents) and are accessible via yearly subscriptions.

The application is simple: Enter the address of the property to be analysed and all the characteristics of the residential property to be valued (sale or rent). A detailed, visually easy-to-understand report then appears with data such as market trends and developments (price trends, days on market, price per m2, offers for similar properties), environmental data to identify the influence of disruptive factors on the price or its specificity (projects under construction, noise, accessibility), points of interest: local infrastructure/amenities (schools, shops, bus stops, playgrounds, doctors, etc.).

Our B2B2C clients, such as real estate agents, mortgage brokers, wealth managers or banks use PriceHubble solutions to:

- advise their individual clients on the property they wants to buy or sell, by giving him all market transparency, and become the trustworthy partner on real estate topics
- help their prospect find their dream property, thus boosting their client acquisition KPIs
- provide property updates to their existing client base, to trigger new business opportunities and to nurture client relationships.

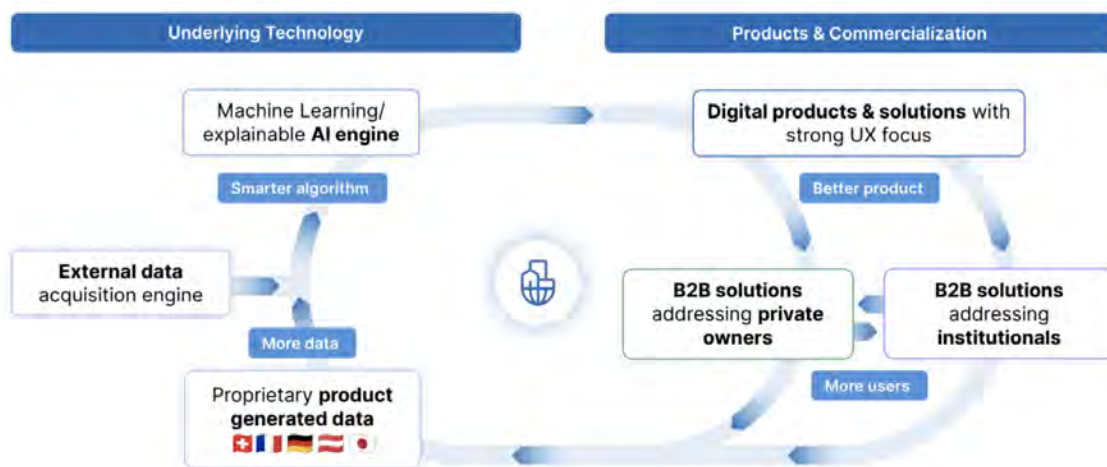
Why is your business model innovative?

PriceHubble provides machine learning-based real estate services with a focus on valuations and value forecasts, presented in an engaging visualisation. By providing customers with cutting-edge real estate valuations and user-friendly insights and analyses, PriceHubble defines a whole new level of market transparency and enables its clients to make smarter real estate decisions - for themselves and their customers.

PriceHubble's technology is unique: its data scientists have developed proprietary machine learning algorithms to

provide the highly valuation models on the market. PriceHubble invests extensively in data science resources to understand the marginal impact of every single parameter on property prices - that is what PriceHubble calls "explainable AI". Furthermore, AI is also used to identify and forecast the impact of upcoming urban developments (e.g. new transportation or gentrification dynamics).

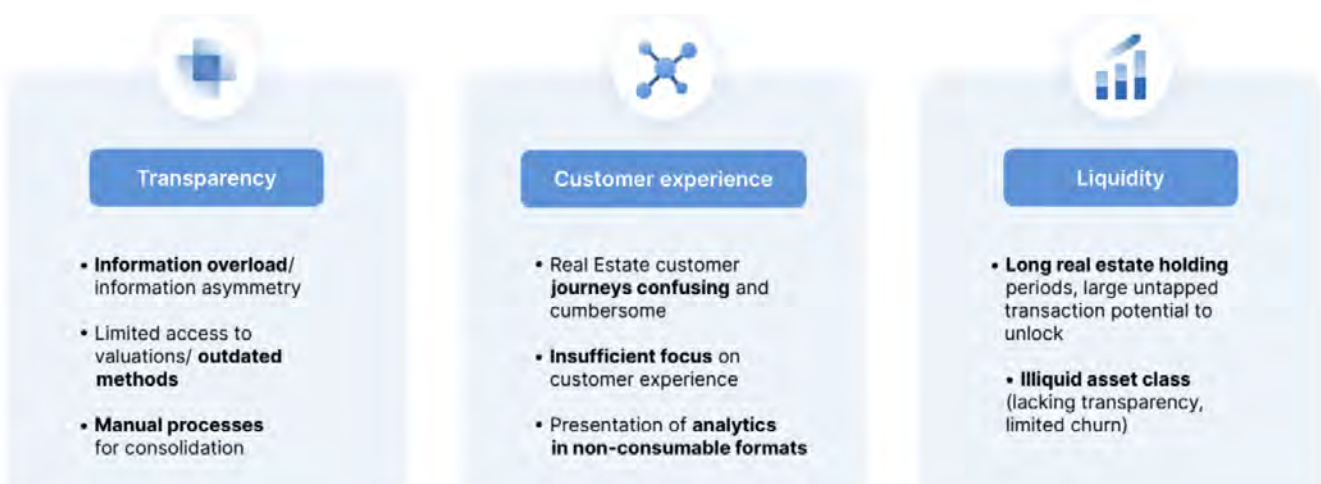
In the countries where PriceHubble operates, it has built one of the largest proprietary databases on real estate markets with an unmatched depth and is creating strong network effects based on real estate and finance data.



PriceHubble's technology stack is highly scalable and its digital solutions are already available in Europe and Asia. PriceHubble's data team is now one of the largest teams in Europe dedicated to residential real estate.

What problems have you been able to solve through your business model?

The pain points our products address: Radically improving the property experience across the Real Estate ecosystem.



Where does an increase in efficiency take place?

Our products not only take the customer experience to another level, they deliver real monetary value.

Our B2B2C solutions are used to e.g.:

- Enhance customer experience and client engagement beyond point of transaction
- Acquire more customers and at a lower cost
- Build trust with the end customer and increase conversion
- Retain customer longer by providing a 360 degrees overview, thus enabling follow-on business

Our B2B solutions are used to e.g.:

- Optimise the rental income & yield of portfolio, while reducing the vacancy rate, proactively
- Conduct faster due diligence and value full portfolios at a click of a button
- Optimise the apartment mix for new development



Patrick Rohner, Head of Business Development
Privera

«We can only recommend PriceHubble and advise interested parties to try out the solutions. One of the main reasons is that the analysis is not only based on transaction data, but that current and upcoming factors such as construction activities, neighbourhood developments etc. are also included in the price calculation.»



Grégory Marchand, CEO
Barnes

«PriceHubble is a reliable tool that we make available to our customers to make online estimates on our website.»



Alexander Boerger & Alexander Surminski, Managing Directors
Immocation

«Have you hubbled that yet?»

«This is the first question when it comes to valuing a property or a location. At Immocation, we want to give our community the tools they need to buy and sell real estate in the best of their knowledge and based on solid data. Real estate investing is not a closed book and PriceHubble has already become a key element for all Masterclass participants and Immocation coaches.»



Mathias Ramsbott, Responsable Département Vente
Lodges

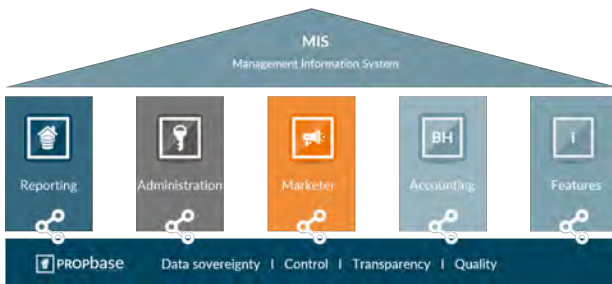
«PriceHubble's ultra-accurate valuation files are perfect for prospecting with our highly qualified potential customers.»



PROPbase AG is a PropTech company based in Neuhausen am Rheinfall in Switzerland.

We offer property owners, investors & asset managers direct digital access to all information relating to their own properties. Property managers receive complete workflows on one platform. Thus, discerning clients benefit from a unique service.

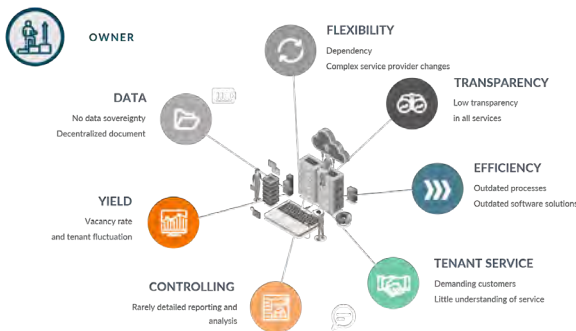
"We provide you with maximum transparency on your monitor".



Integral Solutions for real estate professionals

Mapping of all processes over the entire life cycle of a property. Interchangeability of software modules according to the „Best in Class“ principle

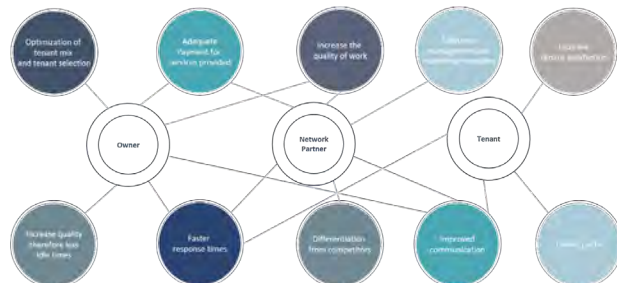
The real estate industry works «analog» with various silo solutions



What are the current challenges for real estate owners?



What do tenants and prospective tenants expect today?



Accessibility of services



Added value for all involved

PROPbase unterstützt Immobilien-Eigentümer mit einer Vielfalt von Digital-Services. Dadurch erleichtert und ermöglicht PROPbase die digitale Transformation.



More information available on: www.propbase.ch



Take your building technical management to the next generation

High energy consumption is one of **global and business challenges**. Also, buildings account for 40% (forty) of energy related CO2 emissions.

The only way to **reduce CO2 emissions** is to cut energy consumption. Actually, this is very easy – just turn everything off and you are able to save even 100% (hundred per centage) of energy. But ofcourse, all the people would escape from you, because it would lose all the indoor comfort and health as well. So, the main question is, how to **save energy and increase indoor comfort** at the same time. R8 Technologies (<https://r8tech.io>) has a solution for that.

R8 Technologies is a PropTech company active in 15 European countries with a HQ in Estonia. Over 700.000m² of premium class commercial buildings are connected to our software already.

We have developed a unique Artificial Intelligence based tool, **R8 Digital Operator** that takes premium class commercial buildings technical management to the next generation by ensuring highest indoor climate comfort and energy efficiency. How?

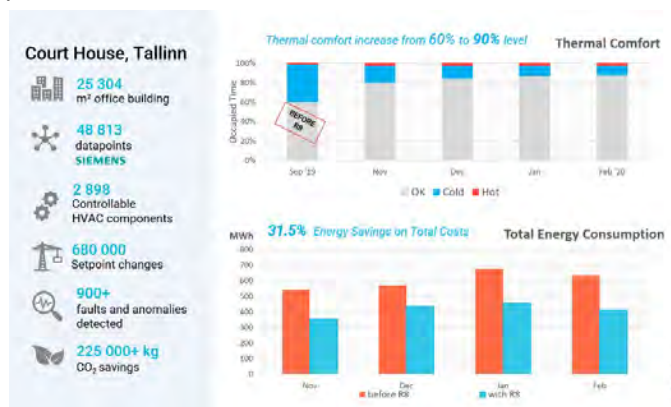
The easiest way to explain it – our **Artificial Intelligence** is just more efficient than humans. But probably you would expect a bit more detailed explanation.

For the **first step**, we integrate our software to the building automation system remotely according to the highest IT-security standards. It doesn't matter what brand of building automation system you have, we're able to connect it on a secure way.

Our solution, is a **cloud-based software**. We use the data of the building automation system to create valuable insights. And the most unique, we use data **to adjust settings** to optimize comfort levels and energy usage. The more complex the building is, the better results we can achieve.

The most important – all decisions of Digital Operator are made according to **3 main Key Performance Indicators**: Energy Efficiency, Indoor Comfort and Building's Technical Condition. With that, we're able to make sure your Heating, Ventilating and Cooling system is running as it should be - at the most efficient way. As a result, we always save you more money than we earn from you and it does not matter if it is a savings sharing model or a fixed fee **business model!**

Court House, Tallinn
25 304 m² office building
48 813 datapoints SIEMENS
2 898 Controllable HVAC components
680 000 Setpoint changes
900+ faults and anomalies detected
225 000+ kg CO₂ savings



More information available on; <https://r8tech.io/>



THE NEXT STEP OF THE EVOLUTION IN HOME AUTOMATION

After noticing that no home automation system reaches all the expectations of the building professionals, from the promoter to the electrician, we developed a disruptive solution by creating our own solution based on **4 targets** :

TARGET 1 : the fastest and easiest to install and deploy

HOW : NO PROGRAMMING, only configuration. The electrician can preset all the devices online in its office, then all the devices become « plug and play ».



TARGET 2 : the sustainability and maintainability

HOW : NO PROPRIETARY PROTOCOL, only based on industrial, free and open protocols and OS. Thousands of devices are interoperables.

TARGET 3 : the most affordable without compromise

HOW : NO OVERCOST, only the right price. By minimizing the need of various devices and by relying on mastered technologies.



TARGET 4 : the most versatile and complete

HOW : NO TECHNICAL BARRIER, only the most skilled, talented and motivated developers. Smart Home SA offers the widest range of fonctionnalités.

OUR PRODUCTS



The smarthome :
the brain of the house



The smartcloud :
the Swiss based
cloud computing server



The smartmeter :
the box to read the
energy consumption



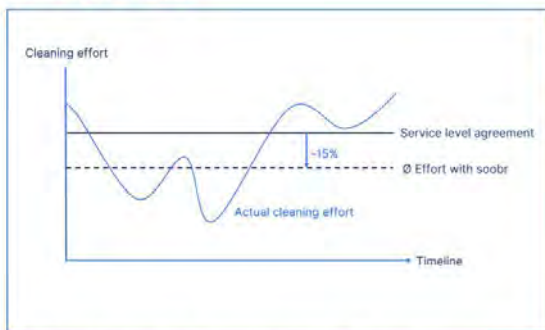
soobr - shaping the future of cleaning

Cleaning in the right place at the right time to reduce costs, improve quality and create transparency.

„Rigid cleaning schedules on paper are no longer up to date. Smart Cleaning means optimized and dynamic planning and execution of cleaning services. For more efficiency and transparency.“
Kaspar Adank, CEO, Soobr AG

Cost reduction through demand-oriented cleaning

Cleaning on demand



Execution

Customer	Industry	Before soobr	Savings
A (GER)	Services	131 hrs	-8%
B (CH)	Services	222 hrs	-9%
C (CH)	Manufacturing	961 hrs	-12%
D (CH)	Services	537 hrs	-16%
E (CH)	Finance	858 hrs	-23%
F (NED)	Manufacturing	226 hrs	-27%

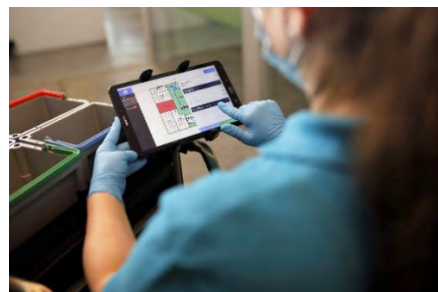
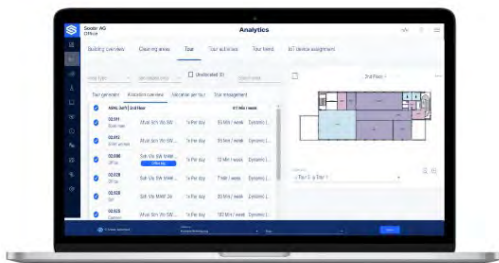
Annual Savings of 15% on average

- Considering the fluctuations of the actual cleaning effort based on dynamic cleaning frequencies
- Demand-oriented cleaning prevents over-fulfillment and enables cost savings with consistent quality thanks to dynamic cleaning frequencies

Optimizing cleaning with AI

Soobr offers optimized, demand-oriented planning and execution of cleaning tours based on data and artificial intelligence. Using existing service level agreement and building data as well as sensor data, the actual cleaning demand is determined.

The combined data results in dynamic route planning, which is visualized on the building plan and displayed to the cleaning staff on a tablet. Control your cleaning service provider with Soobr and create complete transparency about the service provision.



Unique transparency to realize quality improvements and cost savings for your company. Over 35 projects and more than 200 cleaning tours daily in buildings in Switzerland, Germany, the Netherlands and Japan.



info@soobr.ch
www.soobr.ch



Inspect thousands of buildings in seconds

Through image recognition on satellites, airplanes, drones, cars, and images made by inspectors and tenants.



Dirk Huibers
d.huibers@octo.nu
+31653312425



Make better asset management decisions with Spotr.ai, powered by artificial intelligence.

HeadsUp

Unlimited view for building managers





Why Tayo?

100% mobile, 100% secured, 100% made in Switzerland: Tayo is the best property management platform to **share** information, **communicate** effectively and **auto-mate** simple, low-value tasks.

Key benefits

We **cut costs** for property managers / owners and bring **speed, quality, transparency** and **agility** to their processes.

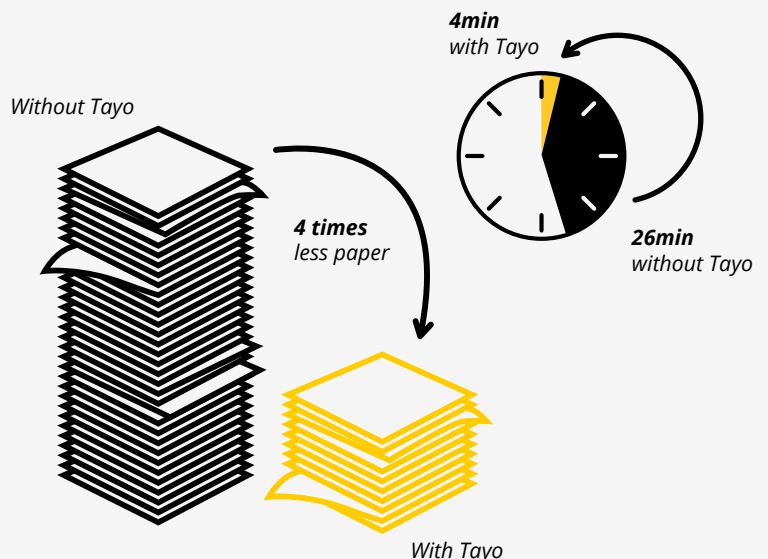
Tayo has a reliable, simple and configurable operations management process, from ticket to quote to invoice. We provide an optimized service for tenants and condo-owners, 24/7.

How we innovate

Data analysis, predictive maintenance, omni-channel, automation of simple tasks, knowledge of the legal and data protection framework, cybersecurity issues, new business models, transactions, interfaces with other platforms, integration of players from various backgrounds in order to simplify interactions in property management.

Tayo is above all a cutting-edge digital platform for its users, with a white label service and a no-obligation subscription.

What will it look like?



Our volume

In 2020, **90'796 operations** were created and handled via Tayo. This represents 33'292 hours (3,8 years) that our customers saved and allocated to core business tasks.

“

It's like we (i.e. property managers, tenants and service providers) are all in the same room. All parties save time, paper, postal and printing charges ... and therefore money. The risk of error is minimized, the loss of documents is eliminated, and if one of our employees is absent, the follow-up of the operation does not suffer. Processes are standardized, business continuity and traceability are ensured.

— BORY about Tayo

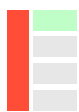
”

unlatch

Solutions for off-plan
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Accelerate and digitize your property sales.



A CRM to manage your activity

Our CRM allows you to broadcast ads for your developments projects in one click and easily view the progress of your sales.

Give your sales representatives a CRM that they will actually use.



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Your buyers have access to a personal space, in your colours, allowing them to follow the progress of their real estate project, from the reservation up to the delivery of the property. They can chat with you using the messaging service, access their files at any time, sign additional documents, book appointments, keep up with the progress of the construction site, and receive calls for funds.



Electronic signature and registered mail

Unlatch enables contracts to be signed electronically, as well as notify buyers by electronic registered mail. Save time, paper, and speed up the process of providing documents to different stakeholders.



Collaborative workspace for sales tracking

For sales tracking, all the stakeholders of a project, including you and your notary, share a centralised collaborative tracking platform allowing you to automate the tasks and processing of your reservations as much as possible.



Unlatch, powerful technology.

All our solutions are created by engineers hand in hand with real estate professionals so that whatever your annual volume of real estate sales is, Unlatch is suitable and powerful.

Discover more features on getunlatch.com/en

Woonig

The digital property manager

COMMUNICATION AND INTERACTION PLATFORM

New way of property management

Woonig is a “Software as a Service” communication and interaction platform for real estate property management (RE edition) to digitize and automate the processes between property managers, tenants/condominium owners and service providers.



We offer a modern way of communication and interaction for all parties, that saves time and increases the quality.

The processes are optimized in a way, that the personnel resources can be optimized to the essentials. The property manager can concentrate on the work that requires personal activity. Woonig AG is based in Switzerland and was founded by real estate and technology experts.

www.woonig.com

Woonig



No more language barriers!

Woonig automatically translates the communication between tenant/condominium owner, property manager and service provider, in over 100 languages.



Cross platform

Our software is easy to integrate and intuitive to use on all devices. In just a few steps it's configured and can be used productively. We also offer standard interfaces to common property systems.



Interface

Modern interface for the integration of the management software based on the open data API, as a simple import or full integration into the existing system infrastructure.



Multichannel communication

Report requests and claims at any time, across multiple channels.



Cloud-based SaaS

Various standard interfaces for data connection. Register and get started, no software installation is necessary. No infrastructure costs and 99 % availability.



Data storage/hosting

Woonig provides data storage at locations worldwide. North America, Europe, South America, Asia and Australia.



TECHNOLOGY AND
INNOVATION

Topics

The impacts of Technology and Innovation in the markets

The role of innovation becomes even more important for organizational survival due to the challenges of the 21st century. The rise of information technologies and the progressing globalization of markets transform economies and fuel digitization, automatization, and connectivity: the value creation shifts from capital-intensive to information-intensive industries. Firm innovativeness refers to an organization's overall capability to engage in new ideas and concepts that may result in the implementation of new processes or the introduction of new products or services. We develop an enhanced, more holistic, measure of firm innovativeness with broader applicability. We define firm innovativeness as an organization's overall capability to engage in new ideas and concepts that may result in new processes' implementation or in new products' introduction. The PropTech companies have come onto the market with digital, innovative and sustainable business models, which create ground-breaking momentum.

1. The adoption of technology in the construction sector

Construction technology as the collection of innovative tools, machinery, modifications, software, etc. used during the construction phase of a project that enables advancement in field construction methods, including semi-automated and automated construction equipment.

The construction company goes through three phases from solution to technology implementation, while vendors proceed from diffusion to after-sale services as the second side of the process. The vendor side could be replaced by a manufacturing representative, an innovator, a dealer, a supplier or sale people. Technology adoption occurs in an environment with two main players such as vendors and construction companies.

The adoption of proven technology can improve construction industry productivity by 30-45%, as well as improved material predictability and reliability. The new technologies have a large beneficial effect on overall productivity in construction.

Even though the construction industry has not kept pace with the automation advancements of other industries, automation has proven to improve the most key areas including cost, schedule, quality, safety and production.

Electronic simulation has proven to be a very successful application for the industry improving constructability, maintainability, operability, quality and safety while reducing cost and schedule.

Other technologies adopted by the industry, such as wireless and advanced building technology have all provided industry benefits in quality, productivity, reliability, less rework and improved inventory management.

1.1 Technology attributes

Maturity
Brand
Reliability
Versatility
Capacity
Power
Durability
Site performance

1.2 Operational barriers

Construction firms and crews tend to be old-fashioned or comfortable in how they do things and wary of fancy new technology offerings.

Many firms understand the benefits of technology but are reluctant to take crews off billable projects for internal training and implementation.

Failed implementation of the adoption of a past technology solution can make firm management averse to additional technology opportunities.

1.3 Social barriers

Construction companies prefer to "buy into" a technology only after it has already been successfully used by another company, especially a competitor.

Field workers often don't want to change how they do their jobs and may feel threatened by technology. Less than one in four construction employees are very comfortable with new technology.

Many companies are slow to adopt new construction technologies, and they continue to underinvest in technology. Construction firms are starting to come around on tech adoption. Companies that are researching and implementing construction technology are reaping the rewards with increased productivity, better collaboration, and completing projects on time and under budget resulting in higher profit margins.

The decision to deploy a technology is a function of a variety of influences. There is little known about the decision-making process and the influencing factors. Deriving a clear benefit is a critical objective in construction projects, and cost is often not the most important factor influencing the technology adoption decision.

1.4 Financial barriers

There are several reasons for slow adoption of new technology in the construction industry. Firstly, contractors frequently operate within relatively tight budget constraints and may not have the funds available to purchase and implement a project management or data analytics solution. Implementing such a solution may require the contractor to hire more staff for maintenance and operations, train employees on how to use the software effectively, and provide technological capital to staff to enable usage of the software. These additional costs are prohibitive in many cases.

1.5 Innovation barriers in construction sectors

1. The nature of construction procurement frequently restricts collaboration between client and supply chain, particularly at an early enough stage to fully explore options for innovation;
2. Companies are not confident that innovation will be commercially rewarding, with particular concerns levels of demand for innovative products and services;
3. Companies that do want to innovate find that the necessary finance is too expensive and/or difficult to access, that the approach to risk and insurance of works deters innovation and that some of the Government support available to the industry is not sufficient.
4. There is failure to capture learning from successful innovations and take this forward to future projects;
5. Collaboration between industry, academia and research organisations is patchy, which limits effective knowledge transfer; and
6. The segmentation of the construction process is a main barrier to innovation: the uniqueness of projects results in lack of repetition and limits the possibility of learning effects and economies of scale; furthermore, the separation among the process steps caused by the several parties involved leads to the optimization of single steps rather than to innovation of the entire process.

2. The adoption of technology in the real estate sector

Today, technology continues to be a catalyst for change in all sectors of business and industry, and real estate is no exception. From Artificial Intelligence (AI) platforms to digital open houses to blockchain integrations, new technologies are taking over the real estate sector by storm and streamlining the way we do business.

The most real estate companies have service-oriented businesses that pursue transaction or property holding activities. The real estate is an inherently heterogeneous and fragmented sector. There are many fields of activities, both parallel and sequential, along a building's life cycle (planning, building, management and demolition). Real estate firms are active in one or more than one field, as well as in one or more than one market. Additionally, real estate firms range from family-owned businesses to publicly listed companies. Consequently, there is a broad variety of business profiles regarding the firm size, market coverage, service offerings' scope, exit strategies, and foci on certain real estate types.

The real estate sector is a huge sector in almost every economy, but despite the huge scale, it has been slow to turn to technology when compared to other industries. These technologies may not be so novel anymore, but the late adoption rate by the real estate industry and the recent emergence of newer innovative ideas indicate a more commercial use of these technologies in the real estate industry. Even though the

technology adoption by the industry lags the technology development significantly, the appetite for more tech infusion in the industry is increasing as a result of the benefits experienced so far. Technological solutions to real estate problems are at the core of the smart-city revolution. City densification and the jobs they accumulate make real estate technology and built-environment solutions more critical to good city functioning. By improving market transparency, adapting to evolving customer desires, facilitating speedier transactions and enhancing asset utilization, as well as regulatory requirements, the industry can reduce friction in the market.

2.1 Operational Barriers

Software integration

New systems must integrate with existing legacy practices and software.

Standardized digital data

Technological efficiency relies on up-to-date, accurate digitalized data.

Critical mass

Due to network effects, novel systems can only be successful if they are widely used.

Transition costs

Considerable financial investments are needed to replace existing software and hardware and to up-skill the labour force.

Security

Data security Easily accessible data are vulnerable to data breaches; it is vital to ensure that new systems are resilient against cyber-attack.

2.2 Regulatory barriers

Legal framework

Novel systems must conform with existing legislation; some solutions, like Blockchain land registrations and rent contracts, might require legal adjustments.

Technology transparency

Solutions must be transparent as to their data sources and the reasoning behind any outputs.

2.3 Social barriers

Expected benefits

More efficient technologies should benefit their target users to bring incentives for adoption. The long-term financial benefits must be clearly understood.

Disintermediation

Some participants in current conveyancing systems might be replaced by digitally mediated transactions. Novel solutions must clearly sketch these effects and align incentives for potential adopters.

Trust in innovation

Unclear functionality, benefits, and associated risks of novel solutions can reduce trust and hold back investment and private sector data collaborations.

3. Why do we need the innovation in the sectors?

Innovation translates ideas or inventions into services or goods, creating value or meeting consumer demands in the process. In doing so, it yields financial benefits. Innovation aims to take advantage of potential solutions and associated case-based facilitation to add value for business and social benefits. The key innovation models in construction and real estate are incremental, radical, autonomous, and systemic. The process from innovation to adoption moves through six cyclic steps:

1. need,
2. creation,
3. invention,
4. innovation,
5. diffusion,
6. adoption.

3.1 The reasons that prevent innovation

3.1.1 Costs

1. The Cost is too high
2. Too big perceived risk
3. Insufficient internal resources
4. Insufficient external funds such as venture capital,
5. Public money

3.1.2 Know-how

1. Insufficient innovation potential (R&D, design, etc.)
2. Not enough qualified staff in the company and on the labor market
3. Insufficient knowledge of the technologies
4. Insufficient knowledge of the markets
5. Insufficient availability of external services
6. Marketing
7. Organizational barriers in the company
8. Attitude of the staff to changes
9. Attitude of management to changes
10. Management structure of the company
11. Insufficient staffing of Innovation activities

3.1.3 Markets

1. Uncertainties in demand
2. innovative products
3. Dominance of the "top dogs" in the potential markets

3.1.4 Institutional factors

1. Lack of infrastructure

2. Legislation, regulations, standards,
3. Taxation
4. Legal uncertainties
5. No need for innovation

Real estate is an information-intensive and information driven industry that involves various types of information intermediaries and principal-agent relationships. Property technology improvements are attributed to increase transparency and quality of services, as well as to reduce risks, costs, and time delays. PropTech enables new ways of accessing and processing information, such as sharing information and bypassing traditional intermediaries.

In order to introduce more radical change, the entire system has to change. This system-wide change could be triggered by the PropTech Academy that dictates an academically binding framework. International PropTech Standards and International PropTech Innovation Evaluation Methods are the first step to regulate business areas in the real estate, construction and finance sectors. PropTech Academy is able to broadly roll out new standards due to their market power, could impose frameworks for common, system-wide objectives. These non-governmental activities highly depend on players who join forces and drive these initiatives and alliances actively. In contrast, regulatory restrictions that reshape industry structures imply passively induced change. The market players need to be aware of the PropTech Academy's importance and the systemic effects, which they need to consider in their (innovation) strategy.

References:

Innovation in Service Industries, Susanne HÜgel, EBS Universität für Wirtschaft und Recht, EBS Business School, Wiesbaden, Germany, Springer Fachmedien Wiesbaden GmbH, part of Springer Nature 2019

The most used technologies in the Real Estate and Construction Sectors

1. 3D Modelling

The 3D mentioned plays a vital role in the functioning of any system. This would help the user to properly analyze the Virtual Dynamics of the system and make the design modifications before getting the system fabricated, which is nothing but the development of the system. The system proposed is found to be more and more efficient if all these processes are accessed remotely anywhere by anyone. If the virtual representation of the dynamics of a physical system is visualized and analyzed remotely, this would facilitate the Remote Engineering technology also by helping the user in some ways. *

3D is now being used by architects, engineering firms, and interior designers to validate design for manufacturing and assembly, the feasibility of the design, enhance the effectiveness of construction and eliminate uncertainties. "In addition to the BIM method, additional aspects of digitization come into play during the tender and production phases. It is thus possible to guarantee the safety of the site remotely by means of video surveillance and the use of drones. The delivery chains can be respected and controlled using RFID chips. Some also use innovative construction methods involving robots and 3D printing. Communication between the different actors.

The project using digital instruments is becoming increasingly important as it makes it possible to coordinate the agenda, organize meetings and transmit important information to the person responsible.

* Digital Economy: Complexity and Variety vs. Rationality, 2020, Editors, Elena G. Popkova, Bruno S. Sergi

2. 3D Printing

3D printing in construction refers to computer-aided construction methods for erecting structures using 3D printing technology. These processes have their origins in the prefabrication of components, for example, in prefabricated houses.

The 3D printing makes possible to display 3D information and to create 3D physical objects. The main principle of 3D printing is based on the gradual (layer-by-layer) creation of a solid model which is «grown» from a certain material. The 3D printers using is a serious alternative to traditional methods of prototyping and small-scale production. The advantages of 3D printing over the usual, hand-made methods of model creation are obvious. These are the high speed, the simple character and the low cost. 3D technology eliminates the hand working process and the need for making drawings and calculations on paper. The errors typical for the hand-working become impossible too. The special program allows seeing the model in all its aspects already on the screen. So, the errors can be already identified at the stage of development. *

3D printing. Although the initial idea behind 3D printing, which basically refers to layer-wise creation of any physical object, has existed since the invention of early rapid prototyping methods like stereolithography in the 1980s (Jacobs 1992), associated promises of the “freedom of creation” or “a new industrial revolution” emerged only during the last decade (Hopkinson et al. 2006; Pine and Korn 2011). **

* Digital Economy: Complexity and Variety vs. Rationality, Editors; Elena G. Popkova Plekhanov, Russia, Bruno S. Sergei, USA, Italy, Springer Nature Switzerland AG 2020

**Entrepreneurship in Innovation Communities Insights from 3D Printing Startups and the Dilemma of Open-Source Hardware, Jan-Peter Ferdinand Technische Universität Berlin, Germany, Springer International Publishing AG 2018

3. 5G and Wi-Fi 6

5G is the fifth-generation wireless technology for digital cellular networks, boasting faster speeds, better traffic handling and less congestion. To accompany this, Wi-Fi 6, the newest standard of Wi-Fi technology is also improving on its predecessors.

With the huge improvements of cellular solutions, mobile construction site broadband is proving a competitive alternative to the traditional fixed lines, and we are seeing more construction sites and developments moving towards this and reaping the benefits of quicker installation times and greater flexibility whilst still receiving the required level of service.

5G and Wi-Fi 6 will enable users to communicate effectively, share large scale drawings, run resource-heavy applications without compromising speed/performance. Not to mention, it will provide a reliable and secure communication network on which new and advanced technologies will utilize.

4. Application Program Interfaces

An Application Programme Interface, or API, is ‘a set of functions and procedures that allow the creation of applications which access the features or data of an operating system, application, or other service’. Simply likened to one half of a bridge, these links can be built into software platforms which enable others to be able to export the data they produce for use in their own technology. The Innovation Strategist felt that as opposed to looking towards new technology to create a trusted real estate information database, upgrades in old, currently difficult to integrate APIs would present the ability for a platform to emerge able to house all the necessary information needed to eliminate transaction delays.

5. Artificial Intelligence

Artificial Intelligence (AI) simulates human intelligence with machines, especially computer systems. This includes learning (gathering information and rules for using the information), inference (using the rules to draw approximate or definitive conclusions), and self-correcting. The special applications of AI are expert systems, speech recognition and machine vision.

AI can be categorized in a number of different ways. Here are two examples:

- The first type classifies AI systems as either weak or strong AI. Weak AI (weak or narrow AI) is an AI system that is developed and trained for a specific task. Virtual personal assistants, such as Apple's Siri.
- Strong AI, also known as general artificial intelligence, is an AI system with generalized human cognitive abilities so that when faced with an unknown task, it has enough intelligence to come up with a solution.

AI can be used for predictive analytics, analysis of locations, conditions, buildings, investment, risk, management, production and also for voice-command-based solutions in the real estate, construction and finance sectors.

6. Augmented Reality

Augmented reality is a stimulated experience of a real-world environment. It is a part of virtual reality and allows users to create interactive and memorable experiences. Augmented reality can come in handy when the building is still in the construction stage; however, if you already want to market it and find buyers/renters, augmented reality technology allows you to create a finished product (in the case of properties, it would be a finished building), which looks as close to the real one as possible. Marketing at an early stage of development allows agents to sell property quicker, therefore generating returns more efficiently. This also increases competitive potential, as by providing a more exciting and high-level service you can increase your market share and enhance brand loyalty.

7. Automated Valuation Model

Automated valuation models (AVMs) are mathematical models, which, together with appropriate computer software and databases of property information, are used to provide real estate valuations. AVMs are categorized into at least five types. These are hedonic models, econometric forecasts, 'intelligent' systems, house price index models and tax-assessed value models.

8. Big Data

Big data technologies describe a new generation of technologies and architectures, designed to economically extract value from a very large volume of a wide variety of data by enabling the high-velocity capture, discovery and/or analysis. Big data has been identified as having the potential to revolutionize the large amount of data available in present times.

Big Data Analytics is the main sector in property technology and has impacts on each PropTech sectors, from land, planning, construction, sales, leasing, letting, occupation, maintenance to the end of life. Within real estate, big data can be thought of as that which is being produced in near real time, and too voluminous for traditional regression and spreadsheet models, like an excel data, to interpret.

9. BIM

BIM is a technology that provides a platform where many parties can get involved in sharing information and analysis of the building or facility in terms of time, cost and quality. The information to be shared in the database not just includes the physical appearance, but also the details of each component of the building. Scottsdale (2009) comments that “BIM represents evolution from traditional 2D design to a dynamic 3D model build around a database of a project’s physical and functional characteristics”. It means that instead of relying on traditional paper-based 2D design, BIM provides a model constructed from a database containing all the relevant information of the project for discussion.

Moreover, in the Guide for ASHRAE members, Conocer et al. (2009) state that BIM can create a precise model and hence improve productivity, lower construction cost and enhance construction quality. It is because accurate material quantity, scheduling and process control can be derived from information contained in the building model automatically. So, there is increase in productivity and reduction in construction cost as a result of reduction in wastage of time and material. In addition, one of the key findings shown in the Smart Market report (McGraw Hill Construction 2008) is that 82% of BIM experts believe in the improvement of productivity by adopting BIM. On the other hand, with the help of the visualization feature of BIM, clashes and conflicts can be detected and observed from the model. Thus, immediate remedies or changes can be made to have a better construction quality. **

**Proceedings of the 21st International Symposium on Advancement of Construction Management and Real Estate, 2018, Authors, A. Nadeem, A.K.D. Wong, G. Akhanova, S. Azhar and S.N. Wong.

10. Blockchain

Blockchain is digital information stored in a transactional public database (block), that is peer-to-peer controlled or verified by a network of computers (chain). Compared to standard databases, blockchain does not need central authority just because all information exchange is happening between end users – peers or nodes, without mediation of a middleman.

Every node in the chain contains different types of information like evidence of a bank’s fiscal transaction, contract, ownership certificates and authenticity statement. Blockchain data safety is controlled by each node in the chain, responsible for guarding its piece of information by digital signature and allowing prompt and secure information exchange, without any third parties.

11. CAD

Computer Aided Design (CAD) is a software application for designing, constructing and presenting construction drawings and maps, for both 2D and 3D models. CAD solutions are used mostly in construction and real estate sectors. Modern CAD programs are based on object-oriented databases. Each component of the design consists of one or more programmatic objects. Changes and specifications are the parameters of the objects. Parameters can be based on relationships with other design aspects and expose versions

and variations of the same design. Object-oriented databases allow optimal reusability of design components, the best possible recording of the designer's intention and the possibility of quick adaptation.

12. Chatbot

Chatbot is a text-based dialogue system that allows chatting with a technical system. It has an area for text input and output, which can be used to communicate with the system in a natural language. Chatbots can, but do not have to, be used in conjunction with an avatar. With the increasing computer performance, however, chatbot systems can access ever more extensive databases faster and faster and therefore also offer intelligent dialogues for the user. Such systems are also known as virtual personal assistants.

The term “bot” is derived from the English word “robot”. It describes a computer program that can perform certain tasks independently and automatically. The software uses a database from which it draws its “knowledge”. Natural language processing (NLP) and machine learning are used so that chat bots can conduct human-like dialogues and learn from previous dialogues. NLP analyses the natural language in texts in order to identify the "intent" of the messages, i.e., the intention behind a request from the user. The chat bot uses data sets such as synonyms, predefined categorizations of text modules and complete dialogues. The following applies: the more data records, the more likely the user will receive a suitable answer to his question. Furthermore, machine learning is used to automatically add new data records based on the responses from users, which, based on their categorization, make the bot more and more intelligent over time. This is crucial so that the service communication for the user is getting better and better.

In the area of property management and property management, chatbots have great application potential in areas with standardized processes. This means that tenant communication processes are fully automated and tenant inquiries are processed in real time. With the help of these chatbots, the interaction between tenants and landlords is raised to a whole new level of service. The digitization of customer service is made possible through the use of new and modern web applications such as tenant apps, digital concierges and chatbot technologies. *

*Praxishandbuch Immobilienfondsmanagement und -investment, Hrsg. Verena Rock, Christoph Schumacher, Hubertus Bäumer, Tobias Pfeffer, Springer Fachmedien Wiesbaden GmbH, ein Teil of Springer Nature 2019

13. Cloud Computing

Cloud technology enables the possibility of access, use, modify, exchange, administer and manage data stored in remote servers by using appropriate software applications. With Internet connection and authorization, access to these remote resources is supported by mobile technologies that enable anyone to sign in for cloud services.

14. CRM

Real estate CRM systems are also at the forefront of this revolution and have made it easier to manage every aspect of the business. From generating leads to managing

contacts to streamlining workflows, real estate CRM systems have completely changed the way realtors used to conduct business. CRM solutions contain plenty of valuable and verified customer information but lack the big data architecture needed to support the collection of real-time clickstream data from the web, mobile, and other digital channels.

15. Crowdfunding

Real estate Crowdfunding is a way of raising money for real estate investment by reaching out to a pool of investors to contribute a small amount of money towards a project. It is a form of raising funds that allows small real estate investors to fund big projects. Crowdfunding is also referred to us as a real estate peer-to-peer lending or financing of real estate projects.

The process of raising money is conducted via an online crowdfunding platform (see the category, Investment on PropTech Switzerland Map). One party (the borrower) joins a platform with the aim of getting funds to start or improve a real estate project. Another party (the investor/lender) joins a platform to invest capital in exchange for high returns on the investment.

The basic model of property crowdfunding:

- The crowdfunding platform identifies a suitable property – whether it's a single house, a selection of flats in a block or an entire block.
- Investors say how much they want to put in until the purchase is 100% funded.
- The platform forms a dedicated company to buy the property.
- Investors are given shares in the company proportional to the amount they contributed.
- The platform finds a tenant, collects the rent, and manages everything that needs to be done.
- The rental income (minus the expenses) is paid out to investors, proportional to the amount they invested, in the form of a dividend.

16. Data Analytics

Analyzing big data can be very beneficial for fairly complicated real estate marketplace transactions and a useful resource in making decisions. In general, as it is understood, the real estate industry and digital transformation has a very large scope, so it needs to be revolutionized. Numerous players are adopting large information guidelines in order to benefit a competitive area. Complicated algorithms are being evolved to execute trades via all of the dependent and unstructured statistics won from the assets.

One way to stitch together the data through advanced analytics is to use machine learning algorithms, which make it significantly easier to aggregate and interpret these disparate sources of data. Technology solutions automate the data collection by accessing application programming interfaces (APIs) and connecting various databases before preparing the data for analysis. After all, it is not the raw data that creates value, but the ability to extract patterns and forecasts and use those predictions to design new market-entry strategies.

Especially big data analytics projects based on data sciences can redeem more returns

and benefits from development of data-based product as well as from providing guidance using data. Ultimately, data analytics should have its own strategic direction with long-term roles and goals beyond just a few pilot projects and use cases in the real estate industry.

17. Digital Twin

“Digital Twin is the virtual representation of a system’s elements and dynamics, where the virtual representation of the physical system and the motion of the same is very much required. A platform with a simulating tool, a designing tool and a data acquisition system functioning simultaneously would facilitate to analyze the 3D’s (Design, Data and Development) of any system in a single interface.

The “digital double” (Smart Digital Twin), a prototype or small series (“paperless production”, “everything’s digital”). Digital factory implies the presence of “smart” models of products or products (machines, structures, assemblies, devices, installations, etc.) on the basis of a new paradigm of digital design and modeling Smart Digital Twin [(Simulation & Optimization) Smart Big Data]-Driven Advanced (Design & Manufacturing).

*

A “digital twin”—or digital replica of a physical entity—can aid construction projects by accelerating and automating traditional design, production, and operational processes. As such, it can serve as the backbone for prefabrication and as a more significant means for achieving industrialized efficiency. The digital twin replicates every detail of the original object, whether it’s a high-rise or a jet engine. This means the digital twin can account for the behaviors and processes involved in construction all the way down to the individual materials and components. One clear advantage of the digital twin is its capacity to align sustainability with design goals. In other words, making a digital twin can disclose its carbon footprint and energy efficiency up front. In addition, the technology means that the various pieces of a structure can be produced in an off-site factory and then assembled on site, thus buildings can be not only easily assembled but also disassembled and reused to support a circular economy. **

*Digital Economy: Complexity and Variety vs. Rationality, 2020, Editors, Elena G. Popkova, Bruno S. Sergi

*Proceedings of the 21st International Symposium on Advancement of Construction Management and Real Estate, 2018, Author C.W. Keung

18. Drones

Drones are remote or software-controlled robots used to collect and monitor data from the air.” A significant part of product strategy going forward for real estate developers and property portals is the application of drones for property marketing. Drones can capture 360-degree images from various building heights, giving property purchasers spectacular views that they can expect from their future apartments. Also, through drones, construction companies can now improve safety and mitigate risk. Instead of sending a human up onto a roof to conduct a survey, you can send a drone, which is just as accurate. Drones might be applicable for property inspection.

In addition, the high-resolution images are used for technical due diligence analysis to identify potential risks or lead to a reduction in the purchase price. But even in site analysis, these data provide significant added value. High-quality analyzes of the micro-location can present the advantages and disadvantages of the property in an efficient and meaningful way and help with strategic forecasts on the interaction of the investment property with its sub-market.

19. Geolocation

Geolocation refers to the identification of the geographic location of a user or computing device via a variety of data collection mechanisms. Typically, most geolocation services use network routing addresses or internal GPS devices to determine this location. Geolocation is a device-specific API. This means that browsers or devices must support geolocation in order to use it through web applications. *

Geolocation tools allow real estate teams to identify where their target audiences live quickly and efficiently. Once they've done that, they can build custom territories and send marketing materials to neighborhoods with the highest density of their target audience, increasing their ROI. Today, geolocation is primarily used to understand how people are using the space in order to improve the services provided within it, taking short-term space management or long-term space planning.

Geolocation in the construction sense involves delivering data to help people in the field make decisions they need to make.

* <https://developers.google.com/maps/documentation/javascript/geolocation>

20. Geospatial

Any data that is indicated by or related to a geographic location. Geospatial technology collects and analyzes the geospatial data. Geospatial data can also come from Global Positioning System (GPS) data, geospatial satellite imagery, telematics devices, IoT and geotagging.

There are two main types of geospatial;

- **Vector Data:** Uses geometric shapes to show the location and shape of geographic features. Points, lines and polygons can represent things like cities, roads and waterways. Vector data is scalable, has small file sizes and ideal for depicting boundaries.
- **Raster Data:** Represents data through a digital image such as a scanned map or photograph. It also includes aerial and satellite imagery. Raster data uses a cell-based format called stairstepping to record data as pixels or grids with an image. Spatial analysis depends on heavily on raster datasets.

Geospatial Analytics analyzes data with geographical or spatial information. The analyzes are mostly carried out on the basis of a Geographic Information System (GIS). For the analyses, data must be recorded, managed, converted and examined. Results can be visualized in the form of maps, for example.

21. GPS

The Global Positioning System (GPS) is a navigation system using satellites, a receiver and algorithms to synchronize location, velocity and time data for air, sea and land travel. GPS is made up of three different components, called segments, that work together to provide location information.

The three segments of GPS are;

- Space (Satellites) — The satellites circling the Earth, transmitting signals to users on geographical position and time of day.
- Ground control — The Control Segment is made up of Earth-based monitor stations, master control stations and ground antenna. Control activities include tracking and operating the satellites in space and monitoring transmissions. There are monitoring stations on almost every continent in the world, including North and South America, Africa, Europe, Asia and Australia.
- User equipment — GPS receivers and transmitters including items like watches, smartphones and telematic devices.*

GPS construction technology can assist workers and managers in a variety of ways, from tracking vehicle fleets and equipment to helping workers perform better site surveying before shovels even hit the ground.

* <https://www.geotab.com/blog/what-is-gps/>

22. Internet of Things

Internet of Things is a novel technology model as a large-scale network of machinery and devices able of interconnect by everyone other to collect and exchange information/data. Because of its characteristics, IoT is renowned as one of the most important sectors for future technology, more importantly, it is gaining measureless attention from a wide verity of industries. There is no need to say that contemporary hype around the Internet of Things was massive. It looks like every day a new company comes with a new kind of IoT-enabled product or service. There are several companies in the real estate industry which offer IoT-based service and products.

The IoT is made up of smart devices and sensors that all share data with each other and can be controlled from a central platform. The implications of this are huge as it means that a new smarter, more efficient and safer way of working is now very possible.

Most definitions of the Internet of Things (IoT) take a technology perspective, referring to connected devices exchanging data with each other and with higher levels, establishing autonomously operating systems. Such a definition easily fits in with other technological developments that are driving the digitization of our world. Sensing, ubiquitous communication networks, information systems, data analytics, artificial intelligence, robotics, edge and cloud computing are all linked to the development of IoT, either as an enabler or leveraging IoT for new applications. From a business perspective, IoT can be regarded as a business transformation, driving commoditization or even threatening conventional businesses, providing opportunities for product and process improvements

and opening perspectives for services business or entirely new businesses based on data acquired by IoT. New economic powers and regions will emerge, others will lose relevance. There is no doubt that IoT will be a driver of socio-economic change like the industrial revolution was. *

* Internet of Things, Information Processing in an Increasingly Connected World, Editors, Leon Strous and Vinton G. Cerf, Springer Nature Switzerland AG, 2019

23. Location Analytics

Location is a key aspect of real estate; linking in GIS for fuller understanding of the spatial aspects of location is a critical issue for market players to understand. The location gives information about the quantity and quality of infrastructure and services, accessibility, environmental characteristics, social context and defines the geographic boundaries of the market area.

Location analytics is the practice of adding a layer of geographical data to a business's data assets in order to extract more valuable insights. Location analytics combines geographic data on assets, infrastructure, transportation, and the environment with data on an organization's operations and customers to discover powerful answers to any business challenge and share those insights with the rest of the organization. By adding location analytics to existing business intelligence, organizations can take advantage of this geographic data to create new insights and provide different points of comparison.

24. Machine Learning

Machine learning is a generic term for the "artificial" generation of knowledge from experience: An artificial system learns from examples and can generalize them after the learning phase has ended. For this purpose, algorithms in machine learning build a statistical model that is based on training data. This means that the examples are not simply learned by heart, but patterns and regularities in the learning data are recognized. Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it to learn for themselves.

25. Mapping

The mapping is the act or operation of making a map or maps. The Mapping, any prescribed way of assigning to each object in one set a particular object in another (or the same) set. Mapping applies to any set: a collection of objects, such as all whole numbers, all the points on a line, or all those inside a circle. For example, "multiply by two" defines a mapping of the set of all whole numbers onto the set of even numbers. A rotation is a map of a plane or of all of space into itself. In mathematics, the words mapping, map, and transformation tend to be used interchangeably. *

The real estate discipline itself, especially when referring to the assessment of real estate value by property valuers and surveyors, is largely premised on parameters associated

with the location of the property (Reed et al. 2014). At the same time, surprisingly, there has been relatively little attention given to the underlying fundamentals of locational intelligence which is made possible through the use of spatial information, analysis and mapping methods (Michael et al. 2013). Although the property and real estate industry has a strong reliance on maps, often they are produced at a very basic level where the user has relatively little knowledge about how to create, manipulate and produce maps, or how to utilise more advanced spatial analysis tools and techniques. **

Mapping technologies are used in the real estate, construction and finance sectors for the analysing of many interest groups, data, location, geography, demography, planning, trading etc. After 2010, the mapping had an important role for decision making for any interest. With GPS, 3D, virtual reality, augmented reality and big data analytics, the mapping technologies are growth.

*<https://www.britannica.com/science/mapping>

**Real Estate and GIS, The application of mapping technologies, Edited by Richard Reed and Chris Pettit, 2019

26. Modular Building

A modular building is a prefabricated building that consists of repeated sections called modules. Modularity involves constructing sections away from the building site, then delivering them to the intended site. Installation of the prefabricated sections is completed on site. Prefabricated sections are sometimes placed using a crane. The modules can be placed side-by-side, end-to-end, or stacked, allowing for a variety of configurations and styles. After placement, the modules are joined together using inter-module connections, also known as inter-connections. The inter-connections tie the individual modules together to form the overall building structure. *

Modular buildings are manufactured in sections away from building sites before being delivered to the desired location where they are installed into a final building design. 60-90% of the work is completed in a factory-controlled environment, either as a complete structure or as modular subassemblies for a larger project.

This offsite construction allows the use of lean manufacturing techniques to create the prefabricated modules. These modular units can be placed end-to-end or stacked up to create different configurations. The modular construction process is completed onsite using inter-module connections (or inter-connections) to tie the units together.

*https://en.wikipedia.org/wiki/Modular_building

27. Predictive Analytics

Predictive analytics analyze current and historical data to provide insights into what will happen and why it will happen in the future with an acceptable level of reliability. It attempts to accurately project the future conditions and states. It does not predict one possible future, but rather multiple futures based on the decision-maker's actions. It utilizes a variety of statistical, modeling, data mining, text, media mining, forecasting,

and predictive modeling to identify probabilities of potential outcomes and/or likely results of specific operations. Predictive analytics can only forecast what might happen in the future because all predictive analytics are probabilistic in nature. Predictive analytics can help businesses with a wide range of problems.

The emerging technology of prescriptive analytics goes beyond descriptive and predictive models and shows the likely outcome of each decision. It goes a step further in the future and attempts to answer what should be done and why. It employs data techniques such as decision modeling, graph analysis, simulation, neural networks, heuristics, and ML to suggest actions that the organization could take to achieve the desired outcome (Attaran and Deb 2018). Prescriptive analysis tries to evaluate the effect of future decisions in order to adjust the decisions before they are actually made. Future outcomes are taken into consideration in the prediction. Prescriptive analytics are commonly used in organizations to optimize scheduling, production, inventory and supply chain design, and other organizational activities to deliver what the customers want, and meet and exceed customers' expectations. Prescriptive analytics is the most valuable kind of analytics and usually results in rules and recommendations for next steps. However, it is largely not used (Attaran and Attaran 2018).

Reference; Applications of Blockchain Technology in Business, Mohsen Attaran, Angappa Gunasekaran, 2019

28. Prefabrication

Prefabrication is nothing new, but technology is making its benefits easier to access. Mobile technologies provide visibility into the manufacturing process for anyone involved. Stakeholders can view related details about the project from the beginning to end.

Innovators are also improving prefabrication processes and results. Modular construction is growing in popularity in both North America and Europe. The technique allows five laborers to install hundreds of hospital bathrooms in days.

29. Property Identity

The idea of a property identity is a simple one: to store all the information relating to an individual property in its own unique digital data file, to be maintained by the owner, tenant or real time technology and transferred along with the title. Providing an openly accessible, single pool of up to date, standardized property information could solve many of the causes for delay in the transaction process.

This would be a data standard for core information to be generated and maintained throughout the property lifecycle and for different users. This might include core asset, financial and building performance information, and could build on recent consultation on standards for smart systems and a flexible energy system. Our recommendation is for the property industry and government to work together to set up a property passport with common data standards for more information.

30. Robotics

The construction industry is one of the least automated industries that features manual-intensive labour as a primary source of productivity, and it is surprising that robots have yet to play a significant role. Robotics involves AI-equipped robots conducting complicated tasks with precision.

A key obstacle to this is the construction worksite itself because robots require a controlled environment and tasks that are repetitive and non-variable.

However, as we are now seeing construction sites becoming smarter, with the rise of construction technology, so is the way in which robots can be programmed and used. Here are a few examples of how robots and drone technology is already being used on construction sites today.

Automation and robotics have been regarded as a leading area of innovation in construction. Research has been spread out for decades, and new automation and robotics technologies continue to be developed for the construction industry.

Construction automation and robotics generally refers to a wide spectrum of machinery applications for automating construction processes across the whole project lifecycle, from the initial design, on-site and off-site construction, maintenance and operation control, to the eventual disassembly/demolition.

31. Sensors

Micro-sensor technology provides the toolkit with which emerging PropTech companies have begun to record data and offer operational efficiency gains. With the development of ever smaller, cheaper and smarter sensors, potentially located within other devices (even lightbulbs: see, for example, the Gooee system), the real value for the real estate sector comes in the connectivity between the individual sensors and platforms able to record their output. This connectivity between devices and sensors of any sort has already been referred to as IoT. Modern IoT sensors are able to report on a wide range of environmental indicators including Temperature Sensors, Pressure Sensors, Humidity Sensors, Flow Sensors, Accelerometers, Magnetometers, Gyroscopes, Inertial Sensors, Image Sensors, Touch Sensors, Proximity Sensors, Acoustic Sensors, Motion Sensors, Occupancy Sensors, Image Processing, Occupancy Sensors (IPOS), Intelligent Occupancy Sensors (IOS), CO2 Sensors, Light Sensors and Radar Sensors (Market Research Engine, 2018).

32. Smart Building

A building can be as smart as any other device, it is perhaps a matter of sensitivity, connectivity and interactivity. The building shall be able to sense any alteration, predict any favourable response and interact with the user for enhancing the response efficacy.

Therefore, it shall be equipped with sensor nodes (i.e., smart building elements), and a control algorithm able to dictate its behaviour. Making a smart building, or making a building smart, begins by linking core systems such as lighting, power meters, water

meters, pumps, heating, fire alarms and chiller plants with sensors and control systems. At a more advanced stage, even elevators, access systems and shading can become part of the system.

For doing so, it's important to know: (1) which type of data is need for providing a comfortable, healthy and safe environment for the building user; (2) how the needed sensor nodes, or network, shall be installed to gather useful data for the devised control algorithm; (3) how these data should be integrated to work in a holistic and unique control logic; and (4) which type of actions it will be able to carry out, or how would it interact with the building user. The degree of smartness of the new window unit would be established based on the amount of data gathered, the knowledge produced with data collected, and the extent of the action produced by the installed smart system (i.e., extent of the interactivity and/or connectivity with the rest of the building). *

Sensor integration allows real-time building performance monitoring, enabling immediate intervention when any disturbance occurs. Nevertheless, different data interpretation can be performed by the facility manager or the designer who configures the control algorithm. This will affect the building adaption to climate and the occupant interaction, but the control algorithm could try to benefit from this feedback and adjust the initial control settings.

The integration of sensors within building elements eases the proper data acquisition, data interpretation and, if wanted, reduces the need for an external online platform for managing and storing data because all the system controller could be integrated within the building element.

Smart buildings deliver useful building services that make occupants productive (e.g., illumination, thermal comfort, air quality, physical security, sanitation, and many more) at the lowest cost and environmental impact over the building lifecycle. Reaching this vision requires adding intelligence from the beginning of the design phase through to the end of the building's useful life. Smart buildings use information technology during operation to connect a variety of subsystems, which typically operate independently, so that these systems can share information to optimize total building performance.

* Digital Transformation of the Design, Construction and Management Processes of the Built Environment, Editors, Bruno Daniotti • Marco Gianinetto • Stefano Della Torre, Springer Verlag 2020

33. Smart City

Smart city development is based on two pillars: the first one is represented by citizens' values and beliefs, their vision for the future while the second one reunites what they are able to do in order to transform their vision into reality. Thus, it can be stated that the smart cities model has both a visionary pillar (which incorporates spiritual knowledge) and a practical one (in which knowledge is converted into action). *

The idea behind smart city development is to improve the quality of urban life via monitoring and management enhanced by IoT, communication and information

technology. There's great potential for innovation here – the Internet of Things and Artificial Intelligence are just a couple of those. A smart city is built on a smart combination of economy, living conditions, environment, mobility, governance, and people.

The smart cities model; *

Dimension	Components
Smart economy	<ul style="list-style-type: none"> • Innovative spirit • Entrepreneurship • Economic image and trademarks • Productivity • Flexibility of labour market • International embeddedness
Smart living	<ul style="list-style-type: none"> • Cultural facilities • Health conditions • Individual security • Housing quality • Educational facilities • Touristic attractiveness • Economic welfare
Smart environment	<ul style="list-style-type: none"> • Environmental conditions • Air quality (no pollution) • Ecological awareness • Sustainable resource management
Smart mobility	<ul style="list-style-type: none"> • Local accessibility • (Inter)national accessibility • Availability of IT infrastructure • Sustainability of the transport system
Smart governance	<ul style="list-style-type: none"> • Participation public life • Public and social services • Transparent governance
Smart people	<ul style="list-style-type: none"> • Level of qualification • Lifelong learning • Ethnic plurality • Open-mindedness

Cities that are in the process of becoming smart tend to develop knowledge sources and use technology in order to drive urban growth. All the elements included in the smart cities model focus on knowledge resources, and their development is fostered through knowledge acquisition, dissemination and use. Cities tend to design smartness as a vision to rediscover the city as a community by using technology for investing in knowledge sources that enable managerial, policy and organizational innovation and rely on values, beliefs and ideas of people that live the city driving urban growth and development.

*Exploring Digital Ecosystems, Organizational and Human Challenges. Editors, Alessandra Lazazzara • Francesca Ricciardi • Stefano Za, Springer Nature Switzerland AG 2020

34. Smart Contracts

Blockchain technology, as the unique trustworthy administrator for all parties involved in the contract realization, has potential to establish an error-free process for contracts generation, administration and monitoring. A smart contract is a kind of the digital protocol deployed in the Blockchain network for the purpose of contracted conditions implementation.

In this scenario, every node in a network contains all details about contractual obligations and is familiar with conditions needed to be fulfilled during their realization. Smart contracts implementation through blockchain technology improves efficiency (after a successful inspection – a job done becomes a job paid) and excludes the intermediary parties and their services.

“Smart contracts are the central part of our system. They control the entire process of creating, storing and executing the system’s business logic, and are also used to transfer funds from clients to service providers. Smart contracts contain all the necessary non-personal data for a project to be managed automatically.

This mechanism provides a way to save data on the Ethereum blockchain network and, thus, make it immutable. Everyone can also look up the data whenever they want and be sure about data integrity. Before the start of each project, the client transfers cryptocurrency tokens (fiat-backed stablecoins) to a smart contract.

This amount is used as a payment to the service providers for a successful project, while some small percentage of the budget is transferred to the platform itself, as a fee for the service. Besides the platform fee, a predefined small percentage of funds is locked for the case of a voting process, whereby the success of the project is decided by trustworthy users, which engage in the voting process due to the incentive of an award paid out from the locked project budget. After the score voting is finished, the smart contracts transfer the project budget according to the predefined rules.” *

*Blockchain and Applications, International Congress, Advances in Intelligent Systems and Computing Volume 1010, Editors, Javier Prieto • Ashok Kumar Das • Stefano Ferretti • António Pinto • Juan Manuel Corchado, Springer Nature Switzerland AG 2020.

35. Virtual Reality

Virtual Reality experiences in real estate are still young and evolving. However, the simplification of the property viewing experience can only make it easier for potential investors. It is simulated experience that can resemble the real world or be completely different. The use of VR in real estate can be a game changer as it allows you to showcase your property and have viewings without applicants even having to be there.

The applications of this tech are quite wide. Using VR, a potential buyer can view a property from the other side of the world. Or, they could be shown a development that is yet to even be finished.

To create virtual viewings or 360-degree videos, you would have set up a panoramic camera to capture everything in your property. Such viewings allow interactivity as users can click on hotspots that determine where they will move next within the virtual tour. Interactive visits take more time and money to create, however interactivity will provide your users with a better experience.

In theory, offering 360-degree viewings can significantly boost agency's conversion rates. It would not only save time for potential tenants but also to agents themselves, as they will only attend viewings that have more potential (as applicants would already have an overview of the property via a virtual tour).

36. Voice Activated Property Search

One of the newest advancements to PropTech is the idea that those search engines such as Amazon Alexa, Apple Siri, Google Assistant, and Microsoft Cortana, triggered by voice-activated instructions could help you find your next home. New products like Amazon Echo Show Alexa, which is a screen-based device that works off voice activation and user data preferences, could show properties of your choice by voice command.

“1. It will make us faster

People speak 150 words a minute compared to typing about 40. This means that you can give approximately three to four times the number of instructions to a voice system, then you can type them. Voice technology, therefore, is likely to revolutionize how much we can get done. Real estate agents have a gift for the gab - this unleashes that skill as a tech platform.

2. It will be less exhausting

When you can conduct business and get things done simply by asking questions and giving instructions, the need to peer constantly into a backlit screen 24/7 starts to dissolve, and with it, the headaches, the eyestrain and the cramping thumbs.

3. It will make life easier

The new process might look more like this. Meet someone, ask if they mind if you turn on your assistant, you and your contact talk while the assistant records and picks up key words – name, current address, email, why they want to sell, their fears and concerns, name of their dog. By the end of the conversation, their details are in your CRM and upon

your prompts, your assistant has emailed your new contact a property valuation of their current property, a list of curated properties they might like to buy based on the preferences you discussed together, has connected them into a contact schedule and posted a reminder in your calendar to follow up with a call and a bone for the dog. You win the listing.

4. It will help us deliver higher levels of service

Why don't agents deliver amazing service constantly? In most instances, it is not because they don't want to but because consistency is really hard work – especially with the busy and overwhelmingly manual processes of buying, selling and renting property. With the ability to request things by speaking, we'll be able to take action as soon as we remember or think things through. The need to write instructions or spend time researching dissolves. We can take action in an instant.

5. It will help us be more human

Voice activation will give us confidence that the details are being taken care of, encouraging us to inquire more, connect more and focus on the people - not the device - in front of us. In short, voice-activated technology will make us more human.”

(1) <https://www.corelogic.com.au/resources/speaking-out-how-voice-activation-will-change-real-estate>

The Impacts of Research and Development in the Real Estate and Construction Sectors

Research and development are the important key features of property technology. It is an activity those companies undertake in order to develop new products, processes or services, or improve those that already exist. It is often the first stage in the development process. The R&D cycle often begins with ideation and theorizing, followed by research and exploration and then into design and development. In this process the company works to obtain new knowledge that it might use to create new technology, products, services, or systems that it will either use or sell. The goal is most often to add to the company's bottom line.

The term R&D is widely linked to innovation both in the corporate and government world or the public and private sectors. R&D allows a company to stay ahead of its competition. Without an R&D program, a company may not survive on its own and may have to rely on other ways to innovate such as engaging in mergers and acquisitions (M&A) or partnerships. R&D may lead to patents, copyrights, and trademarks as discoveries are made and products created.

R&D efforts can lead to improved productivity that helps increase margins, further creating an edge in outpacing competitors. From a broader perspective, R&D can allow a company to stay ahead of the curve, anticipating customer demands or trends.

R&D is separate from the most operational activities performed by a corporation. The research and/or development is typically not performed with the expectation of immediate profit. Instead, it is expected to contribute to the long-term profitability of a company.

Why is research and development (R&D) important?

Given the rapid rate of technological advancement, R&D is important for companies to stay competitive. Specifically, R&D allows companies to create products that are difficult for their competitors to replicate.

Types of research and development

All R&D tends to start with ideas and theories – this can relate to identifying issues or new opportunities. The R&D process then focuses on exploring and researching those ideas, seeing what's feasible. There are two main types of research within R&D – basic research and applied research.

Basic research is all about acquiring knowledge and using it to build understanding and intelligence that business can use to its advantage. This knowledge can be the foundation for further R&D projects and feed into strategic business decisions.

Applied research is a lot more defined and often looks to achieve a specific objective. This could be using a new technology, reaching a new market, improving safety or cutting costs. Applied research is often what leads to the development phase.

The design and development phase are all about taking an idea and making it into a product or process. Effectively, it's about translating the research into a commercial product or service. It often involves designs, prototyping, trials, testing and refinement.

Prototyping is key to the development phase as it allows you to identify and overcome issues, and improve the design. Eventually, for those in manufacturing development, you move into manufacturing trials where you look to produce the product on a larger scale.

R&D can be set-up to look at different outcomes as follows:

New product research and development

R&D and product development often go hand in hand. Rapid changes in consumer demands and emerging technologies means there's always a need to adapt. Before developing new products, you need deep understanding of the market and the user needs. This lays the groundwork for the development of the new product.

Various concepts are generated and tested at the outset. These can then be prototyped for further research and testing.

Improving existing products and processes

The continual evaluation of existing products, services and processes is also a key part of R&D. If a product, service or process is no longer profitable or adding value in a market, then it risks stagnating.

It could also be that technology has been developed that could facilitate improvements that may cut costs, make efficiency gains or improve safety. This can include improvements to the manufacturing and production processes of the product.

The level of research and development

- Research and information collecting
- Planning
- Preliminary field testing
- Develop a preliminary form of product
- Main product revision
- Main field testing
- Operational field testing
- Operational product revision
- Final product revision
- Dissemination and implementation

Research and information collecting. At these early-stage researchers should collect all information related to the research including conducting needs analysis, literature, beginning small-scale research and reporting standards to be used.

Develop a preliminary form of the product. The next stage is to create a product design research that will be developed, determining the facilities and infrastructure for research and development process, determine the implementation of trials in the field of product design and determine the job description of each of the parties involved in the research process.

Preliminary field testing. The next phase is a trial of product design research on a limited basis. In this step the researcher needs to do early trials of the research in the field of temporary product design. Products in field trials early stage are conducted repeatedly in order to obtain a design according to the substance and methodology.

Main product revision. This stage is an improvement of the product model or the initial design that has been tested by field trials in a temporary and limited manner. Repairment and improvement of the initial product should be done more by using a qualitative approach. Evaluations performed at this stage are the evaluation of the implementation process of design creation, resulting in improvements and enhancements that will be done internal.

Main field testing. At this stage, researchers can test the product research more broadly. This step is performed to test the effectiveness of the design of the product. Tests on product design effectiveness by the field test will be obtained more complete product design so that it can be in accordance with the wishes of potential users of products.

Operational product revision. This stage is the second stage of repairment after testing a wider field. Refinement and improvement of the research products of the field test at this stage will be more focused towards development, it is because at this stage of the previous field trials carried out by their control in the form of questions. Questions used were pretest and posttest. Refinement and improvement of products will be based on the evaluation of the results obtained so that the approach used is a quantitative approach.

Operational field testing. In this step, the researchers should conduct testing on a large scale to test the effectiveness and adaptability of the design of the products produced. The test of effectiveness and adaptability of product design research involves prospective users of the product in the form of software engineering. The results of field testing of this phase will obtain design models for readily applied software engineering products.

Final product revision. At the final stage, researchers as well as developers and software makers will further refine the results of research products in the form of software engineering that is being developed. Completion of the end product of software engineering is considered necessary to ensure the accuracy and validity of the products developed, so at this stage, it will already have be obtained a product of software engineering that level of effectiveness and accuracy is reliable and accountable.

Dissemination and implementation. The researcher is demanded to convey and discuss the results of research in the form of software engineering through scientific forums or

publish research results through mass media, both print and electronic media and engineering products are required to distribute the software after going through the process of quality control.

Understanding your customers

To know what customers want, it's important to collect all the relevant information and insights you can. Carry out your research by phone, email, online meeting or face-to-face meetings.

Understanding the market

You need to understand how business is done in your industry, the ways products are sold and delivered, and which services and products are offered by other suppliers. Market research has a central importance, especially when developing completely new products or services.

Understanding your competitors

- To learn as much as you can about your competitors:
- Study presentations, whitepapers, studies, use cases, websites and newspapers
- Look at media as soon as they're published, and note any changes
- Try out competitors services as a mystery shopper
- Have a talk with your competitors' customers
- Chat with your competitors – although they're your rivals, they're also your industry colleagues
- Research your main competitors at Companies House.

What are the impacts of research and development in the PropTech market?

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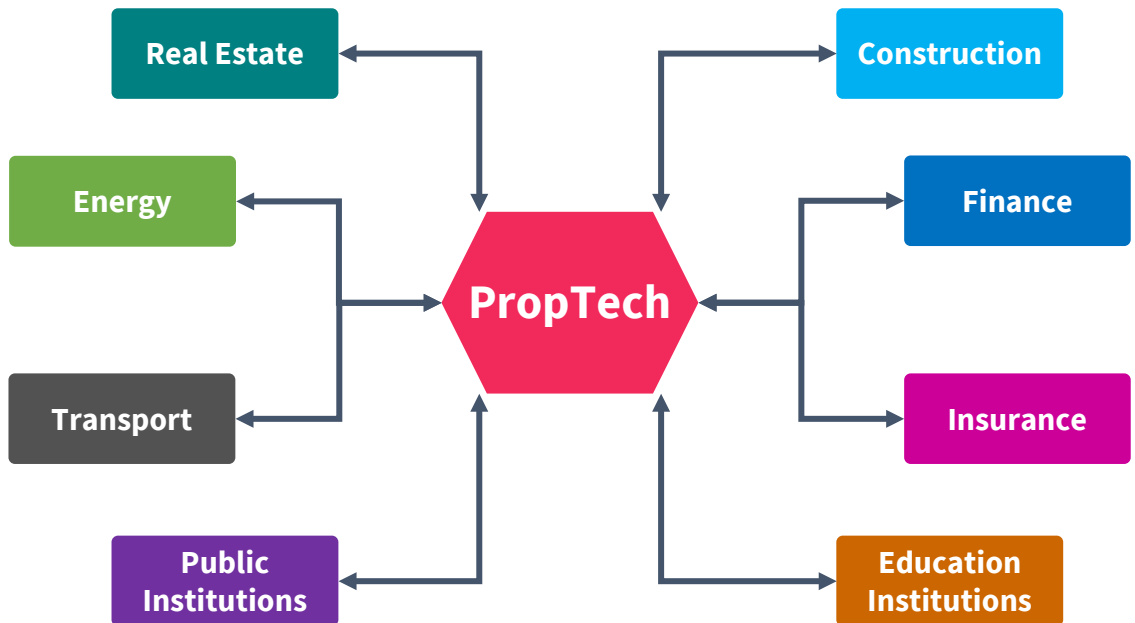
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The impacts of cooperation and partnership in PropTech market



The reasons of cooperation and partnership;

- Technical
- Distribution
- Sharing data
- Sharing experience
- Same client group
- Cost saving
- Building an ecosystem

The advantages of cooperation and partnership;

- Marketing
- Networking
- Know-How sharing
- Reputation
- Minimize risk
- Fast growing

The types of cooperation and partnership in the PropTech market;

- From PropTech to PropTech
- From PropTech to real estate companies
- From PropTech to construction companies
- From PropTech to finance companies
- From PropTech to insurance companies
- From PropTech to public institutions
- From PropTech to education institutions

1. From PropTech to PropTech

This type of cooperation or partnership describes collaboration between two or more PropTech companies.

The possible reasons for collaboration are;

- Building an ecosystem
- Bundling products and services
- Get access to client groups
- Marketing and reputation
- Sharing know-how and data

The types of collaboration are;

- Technical
- Sales
- Strategic

2. PropTech to real estate companies

This type of cooperation or partnership describes collaboration between PropTech companies and established real estate companies. Some established real estate companies cooperate with PropTechs or enter joint ventures in order to develop specific applications through joint know-how. As a result, individual digitization strategies can be supplemented, added value generated, industry standards advanced and the visibility of young technology companies increased. Some companies in the real estate industry are trying to use the innovative power of selected PropTechs for themselves. To do this, they use various forms, such as takeover, participation or temporary partnerships.

Another way of gaining access to the digital scene (PropTech ecosystem) would be to participate in accelerators that target start-ups in the real estate industry. These programs invest in selected PropTechs, provide know-how and work with the companies for a limited period of time with the aim of further developing the start-up at all levels.

Participation in an accelerator program does require a financial investment, but in the long term this has several advantages for established companies. On the one hand, there is the opportunity to participate directly in the success of the PropTechs, and on the other hand, to enter a direct exchange with them, which can lead to a positive output on both sides.

The possible reasons for collaboration are;

Funding and project development

Development of the new products or testing of the existing products

Access to data or know-how

Acceptance at the market

The types of collaborations are;

- Strategic
- Equity Stakes
- Development
- Technical
- Sales

By selecting the right partner, with the right expertise and a technology portfolio to match, companies not only obtain a solution that ideally fits their needs but gain the added benefit of advice in matters relating to property technology and transformation and or integration.

3. From PropTech to construction companies

This type of cooperation or partnership describes collaboration between PropTech companies and established construction companies. The construction sector is too old and moves slowly. The most of the construction market players do not believe the impacts and benefits of PropTech. Last 3-5 years, they started to use some tools and applications to optimize business and work process. They also use automation and robotics solutions nowadays. Unfortunately, they do not trust the PropTech companies yet. Mostly they try to get digital solutions from other suppliers. Digitization or digital transformation do not mean only buy and use. The established construction companies must be open to innovation. Innovation is PropTech companies here.

The possible reasons for collaboration are;

- Funding and project development
- Development of the new products or testing of the existing products
- Access to data or know-how
- Acceptance in the market

The types of collaborations are;

- Strategic
- Equity Stakes
- Development
- Technical
- Sales

By selecting the right partner, with the right expertise and a technology portfolio to match, companies not only obtain a solution that ideally fits their needs but gain the added benefit of advice in matters relating to property technology and transformation and or integration.

4. From PropTech to finance companies

This type of cooperation or partnership describes collaboration between PropTech companies and finance companies. Especially we must talk about Real Estate here.

FinTech sector. Real Estate Fintech describes technology-based platforms which facilitate the trading of real estate asset ownership. The assets can be buildings, shares or funds, debt or equity, lending, freehold or leasehold with a (negative or positive) capital value. The platforms may simply provide information for prospective buyers and sellers, or they may more directly facilitate or effect transactions. This sector supports the real estate capital markets.

PropTech & FinTech common paths

Debt and mortgage tech platforms focus on technical facilitation of the process and intelligent offering. Whereas Better Mortgage, Guaranteed Rate, Lending Home both facilitate the mortgage application process and service the loan.

Commercial property leasing and portfolio management. Leasing and portfolio management are the most pressing issues driving cash flow and return. The companies involved in optimizing the processes use machine and deep learning to automate the leasing management. Some new technologies in commercial real estate, like blockchain, are expected to play a key role in transforming this market segment.

Disposal and secondary market exchanges. Sharoo and Mobility models are being applied here to create what is intended to be a secondary market platform for homes. We are yet to see how viable their business model can be.

Blockchain companies have less of a technology problem and more of a go-to-market problem when it comes to their business models. The companies we found interesting have a strong go-to-market strategy of bringing blockchain to real estate, which we believe to have clear benefits:

- ✓ The low volume of real estate transactions makes them better suited for blockchain technology over other higher-volume transactions (e.g., currency)
- ✓ The high analog costs, like title insurance, associated with real estate transaction and ownership could be undercut with the use of an incorruptible public digital ledger
- ✓ The challenge for startups working in this space will be finding a way to build consumer trust and industry information, without which products aren't viable.

“Activity in the Real Estate FinTech category has largely been driven by growth in the supporting FinTech market, which has led the way in reducing transactional friction, the need for market transparency being most obviously satisfied within both residential and commercial real estate sectors through emerging real estate digital data providers. (2)

Real Estate FinTech companies can provide platforms that can expand and diversify the lender base and enable more individuals and institutions to get exposure to real estate.

Real Estate FinTech services

- leasing,
- Mortgage,
- Loans,
- acquisition,
- Disposition decisions,
- managing the underwriting process,
- accessing detailed financial models for property financing
- Tokenisation

The possible reasons for collaboration are;

- Funding and project development
- Development of the new products or testing of the existing products
- Access to data or know-how
- Access to credit / Access to client group
- Acceptance in the market

The types of collaborations are;

- Strategic
- Equity Stakes
- Development
- Technical
- Sales

5. PropTech to insurance companies

This type of cooperation or partnership describes collaboration between PropTech companies and insurance companies.

The possible reasons for collaboration are;

- Funding and project development
- Development of the new products or testing of the existing products
- Access to data or know-how
- Acceptance in the market

The types of collaborations are;

- Strategic
- Equity Stakes
- Development
- Technical
- Sales

By selecting the right partner, with the right expertise and a technology portfolio to match, companies not only obtain a solution that ideally fits their needs but gain the added benefit of advice in matters relating to property technology and transformation and or integration.

6. From PropTech to public institutions

This type of cooperation or partnership describes collaboration between PropTech companies and public institutions or governmental bodies. The governments and public institutions have their own buildings or they also in real estate. PropTech companies and their products are the best and fast solution to optimize planning, building, investing and managing.

The possible reasons for collaboration are;

- Development of the new products or testing of the existing products
- Acceptance in the market

The types of collaboration are;

- Technical
- Development
- Sales

7. From PropTech to education institutions

This type of cooperation or partnership describes collaboration between PropTech companies and universities or technical schools or private schools.

The possible reasons for collaboration are;

- Know-how transfer
- Support studies and researches

The types of collaboration are;

- Guest lecture
- Invitation

There is no academic-based collaboration between PropTech companies and universities in the world. Universities and academicians do not have enough experience in what PropTech is and which impacts PropTech on the real estate, construction and finance sectors. A lot of them use the PropTech companies as an example or as a use case to explain technologies in the sectors. What they miss, PropTech is not based on an example. It is a new sector which contains technology, innovation and sustainability part of the real estate, construction and finance sectors. PropTech is a generic term and the main market which connects and brings together all three sectors. The potential of PropTech has not been recognized yet. That's why the PropTech Academy builds a bridge between PropTech companies and education institutions and develops educational programmes.

8. From PropTech to PropTech Institutions

This type of cooperation or partnership describes collaboration between PropTech companies and PropTech institutions. The organisation form can be ltd., LLC, association, foundation etc.

The possible reasons for collaboration are;

- Project development
- Networking
- Marketing
- Know-How transfer
- Funding
- Acquisition

The types of collaboration are;

- Membership
- Partnership

There are maybe more than 50 representative PropTech organizations in Europe, north and south America, Asia and Australia. The PropTech communities have a number of interesting features. It is organized exclusively by business and for business. The community generates B2B services without any government involvement. They represent the PropTech companies in real estate, construction and finance sectors. Their main activities are; participation in the events, networked by events, organizing webinars, video streaming, logo presentation, online company directory, publishing company brochure and magazine, offering co-working spaces etc.

However there are a few organisations, such as the PropTech Academy, which regulates, educates and research property technology and builds an intellectual platform for all market players. The PropTech Academy's central platform – encompassing the construction, real estate and finance sectors – provides a combination of innovation, technology and sustainability. As a unique innovative space, the Academy's primary objective is to create an intellectual community of multi-disciplinary professionals to conduct specialist work on innovation that can positively influence the development of these sectors. At the same time, the PropTech Academy is a regulatory institution that aims to create international standardization and evaluation processes for PropTech companies in the real estate, construction and finance sectors that require quality management systems.

The PropTech communities and their leaders

PropTech organizations have different forms, such as a limited company, individual, association, foundation etc.. PropTech organizations do not own standards and criteria for their ecosystem and members. Often the individuals found a community to organize events and earn money. They are not academic-based organizations and the owner/founder of organizations categorize their members according to their individual experience. According to the company's services and products they tried to find the names for the categories or they copied categories

from other PropTech organizations without definitions. There are maybe more than 50 organizations in Europe, North and South America, Asia and Australia. Their main tasks are; participation in the events, networking by events, organizing webinars, offering co-working spaces etc. The most of the startup ecosystem representatives are only event organizers or event participants. Event organization or participation are just some of the activities of PropTech community leaders, but not the main task or strategic task.

The tasks of PropTech institutions are;

- Academic based research in construction, real estate and finance sectors
- Regular market analysis and studies
- Investigation of new business models and integration of international business models
- Invention of new methods
- To help smaller companies to bring service and products to the market,
- Bring startups, companies and education institutions together in a network to overcome problems and share each other's experiences,
- Build a network between tech companies and investors,
- Develop the projects of tech companies for market entrance.

The codex of PropTech institutions is;

- Neutrality,
- Independence,
- Experience,
- Productivity,
- Innovation.

The basic requirements of the leadership are;

Min. 7 years' experience in different positions in construction or real estate sectors, They have to have experience in the lifecycle of building (development, construction, investment, management, valuation etc.)

Min. 3 startups experience (as a developer, a founder or a supporter),

They have to have startups experience as a developer in construction, marketplace, investment, property management, immersive reality, mobility, data analytics, valuation, real estate financing, smart buildings and IoT sectors.

Finding min. 3 inventions or innovative solutions & methods,

Invention and Innovation are keywords for the leaders. If they have not found anything or have not found new innovative solutions and methods, they cannot / should not represent any PropTech community/ ecosystem.

Academic Research and Investigation

They have to have min. A few books and min. 10 research and investigation about property technology, construction, real estate and finance sectors.

- Know-How is the first and important requirement for the PropTech organization founders. If they cannot meet these requirements, how can they represent, teach and support PropTech startups and companies?
- Ability to define and explain PropTech standards

The most important skill for PropTech community leaders is know-how about property technology (PropTech). They should know and can explain the standards of PropTech. What is PropTech? How many categories does the PropTech have? What are the basic criteria of PropTech? What are the criteria of each PropTech category? Who is PropTech or not? If not, why?

- Ability to define and explain technologies
- The founders should know and have to know about the adopted technologies and disruptive technologies. They should explain the basic definitions.
- Market Knowledge

As PropTech community representative or founders, they should know local construction and real estate sectors. The important players, trends, use cases, user behaviors, current needs, gaps etc.

PropTech organisations and platforms in Switzerland

Regulation, Education and Research platform;
PropTech Academy Association



www.proptechacademy.ch

Swiss PropTech Startups Ecosystem;
PropTech Switzerland Association



www.proptechswitzerland.com

The Innovation Strength of Switzerland



www.proptech.swiss

Entrepreneurship Blog Platform



www.techswitzerland.ch

The 2030 Agenda for Sustainable Development by United Nations and the tasks of real estate and construction sectors

SUSTAINABLE DEVELOPMENT GOALS



While digitalization rapidly changes our world, politicians and diplomats of all countries have agreed on a common political understanding of the common goals in a future sustainable world. In September 2015, the UN announced the 17 Sustainable Development Goals (SDGs) as a basis for the 2030 Agenda for Sustainable Development (UN 2015).

Here are some goals, which for real estate and construction sectors relevant are;



Goal 6. Ensure availability and sustainable management of water and sanitation for all*
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

6.b Support and strengthen the participation of local communities in improving water and sanitation management.



Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all*

7.1 By 2030, ensure universal access to affordable, reliable and modern energy services.

7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.

7.3 By 2030, double the global rate of improvement in energy efficiency.

7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.



Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*

8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labor-intensive sectors.

8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services.

8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead.

8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.

8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training.



Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation*

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.



Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable*

11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries

11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning



Goal 12. Ensure sustainable consumption and production patterns*

12.2 By 2030, achieve the sustainable management and efficient use of natural resources

12.4 By 2020, achieve the environmentally sound management of chemicals and all

wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities

12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature



Goal 13. Take urgent action to combat climate change and its impacts*

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Sustainable Digitalization



One of the biggest questions to answer is whether we can shape a sustainable digitalization. It is not too late to answer this question. Whether the digitalization will contribute toward a sustainable development in the long run is dependent on how we shape it. Digitalization offers new possibilities and pathways of how to shape the future of living and work together. Ultimately, digitalization will fundamentally change the structures of our societies and the markets.

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Technologies of Industry 4.0 do stimulate the realization of global goals in the sphere of sustainable development, allowing developing hi-tech and agricultural production, which is peculiar for high efficiency regardless of the natural and climate conditions. Secondly, Industry 4.0 offers new “green” technologies, which allow reducing the volume of consumption of natural resources and minimizing production waste, thus protecting the environment.

PropTech Academy has a research project which develops sustainable transformation of the real estate funds and assets. The sustainable development evaluation method (the detailed method and certification will be developed by PropTech Academy soon), is the first detailed transformation of the real estate and constructions sectors.

Kind of sustainability	Value of the indicator
Absolute sustainable development	90 – 100
High sustainable development	80 – 90
Normal sustainable development	70 – 80
Medium sustainable development	60 – 70
Weak sustainable development	50 – 60
Unsustainable development	30 – 50
Critical condition	0 – 30

We will briefly highlight key challenges alongside the pillars of sustainability to pinpoint vital and promising fields of policy activity. We are just at the beginning of the digitalization of the real estate and construction sectors. PropTech (property technology) has an important role as a regulator to standardize the sectors and set the norms for market players. Without standards and norms, we cannot build a sustainable real estate market or construction market. That’s why the PropTech Academy team have been working to develop the new standards and norms for the markets since 2017. The academy is a regulatory institution aimed to create international standardization and evaluation process of tech companies in real estate, construction and finance sectors and the markets too.

The standards are written for the evaluation and regulation of PropTech companies. They set out the requirements that a particular kind of product, service or process must fulfil, in order to establish that it is ‘fit for purpose’. However, the standards relate to methods of testing, terminology and definitions, information requirements, or the compatibility of connections.

A standard is a basic document that sets out requirements for a specific item, material, component, system or service, or describes in detail a particular method or procedure. Standards are established by consensus and approved by recognized standardization bodies. Standards provide individuals, businesses and all kinds of organizations with a common basis for mutual understanding. They are especially useful for communication, measurement, commerce and manufacturing. They make trade easier by ensuring compatibility and interoperability of components, products and services. They bring benefits to businesses and consumers in terms of reducing costs, enhancing performance and improving safety.

The primary objective of standardization is the definition of voluntary technology, innovation, sustainability or quality specifications with which current or future products, production processes or services may comply. Standardization can cover various issues, such as standardization of different grades of service and products or technological specifications in product or services markets where compatibility and interoperability with other products or services are essential.

Standards and norms provide clear guidelines and instructions that, when correctly applied, should ensure that a service or product will satisfy a series of specific quality, innovation, technology and sustainability criteria, corresponding with customers' requirements. By implementing the relevant standards, you can achieve better levels of performance and reliability. This will help you to attract and retain customers for your products and services, thereby making your business more competitive and successful.

Easier introduction of innovative products provided by interoperability between new and existing products, services, and processes - for example, in the field of the lifecycle of building, workflow management, energy efficiency, co2 reducing, smart cities, smart buildings.

Standardization can make an important contribution to the development of sustainable industrial policy, unlock the potential of innovative markets, and strengthen the position of PropTech in real estate, construction and finance sectors. It brings a solid foundation to build and disseminate innovative technologies and enhance business practices.

Technology and innovation have the potential to improve productivity and competitiveness, increase energy and resource efficiency and effectiveness and, hence, to protect the environment and provide opportunities for developed and developing countries to achieve economic growth and sustainable development in line with the 2030 Agenda for Sustainable Development.

The sustainable measures in the real estate and construction sectors

1. The data centers should reduce energy consumption with green computing concept, cooling systems and green energy productions. The power usage of these centers alone amounts up to 2% of the global energy demand. The market players should prefer green

computing solutions and work with environmental providers. The operator has to subject the data centre to a continuous improvement process aimed at optimizing the efficiency of energy usage.

2. IT devices often contain dozens of different elements whose extraction damages soils, groundwater, and wildlife. Better design and production standards can result in less dependency on raw materials.

3. The cloud services must be hosted by modern, efficient data centers with failover protection. After all, cloud-served company infrastructure and business processes only add value if the technology is guaranteed to run smoothly.

4. The companies might have to implement transparent and sustainable supply chains.

5. The global market economy and governmental bodies in turn have to reward companies that live up to their entrepreneurial responsibility.

6. The public organizations, companies and the other institutions, who work in or with the real estate and construction sector, need to better steer their influence in general procurement toward sustainable standards, for instance, by demanding sustainability certificates for an award of contract.

7. A key principle of sustainability thinking is the open Internet and open data access policy. This groundwork allows for a transformative education dynamic, redirecting societies toward sustainable development.

8. The governments, public and private institutions, companies and all market players must support or create free e-learning platforms. These aspects of the social dimension of sustainability are immensely important as they strengthen education and learning on all levels, enabling future generations to meet their own needs.

9. The governments, public and private institutions, companies and all market players must support research and development projects in digital transformation of the markets and players.

10. Think global and work global. Isolation and ignorance of the other companies and institutions are preventing the innovation and sustainability.

11. The construction companies need to get hold of their supply chain. Increase transparency, traceability, and steering capacity. Mobile enables the real-time tracking and steering of goods from any location. The Cloud can host platforms to share data. The Internet of Things supports automation of supply chain communication across companies and with equipment used by consumers.

12. Lean manufacturing processes in controlled environments is another way to reduce environmental impact. Manufacturing may be completed in a controlled setting like an

indoor factory, where waste can be substantially reduced, and materials can be recycled instead of thrown out. The components of the building are then taken to the site and assembled, which takes less toll on the surroundings of the building.

13. When buildings are designed to be reused rather than demolished, we can reduce the amount of waste going to landfills and reduce the overall consumption of raw materials.

14. When constructing new buildings or renovating old ones, it is important to consider the use of materials that can be source sustainable and can be recycled after use.

15. Cutting materials precisely in order to reduce waste.

16. Controlling waste management, such as separating and recycling waste

17. Managing construction sites to improve the environment

18. Selecting sustainable and recycled materials

19. Building of national and international sustainability open data platform to share experiences and know-how, and cooperation between the parties. Sustainable data are generally held to be the 'oxygen' of sustainable policy. The regional, national and global sustainable data provide a key basis on which companies can take action. The PropTech Academy are going to build a common platform for all market players.

The tasks and measures are not closed with that list. There are also a lot of other things to do. PropTech Academy is still working to develop the international sustainable real estate and construction guidelines and is creating a new evaluation method for the sustainable development.

The fundamental values are challenged and are changing, with consequences for regulations, norms, guidelines and principles. We are only at the beginning of learning about, let alone understanding, the consequences of digitalization in real estate, construction and finance sectors. Combined with ongoing globalization and immense economic challenges, we need to find solutions that enable us to sustain not only in the business areas we work in but also in the societies we live in.

The sustainability in an entrepreneurial economy needs creative approaches. Doing more with less and doing things better with less ecological, financial and societal impact with a balanced societal effect needs ongoing innovative processes in the influence sphere of the users and the producers. We must use digital solutions in meaningful ways to reach these goals. We believe that long-term cooperation, knowledge exchanges, and joint competence building are also key success factors in achieving sustainable digital ecosystems in the real estate, construction and finance sectors.

Sustainability in the real estate and construction sectors can be achieved by assessing the energy and environmental efficiency of buildings, performing sustainability-related activities.

risk assessments, and using locale-specific tools for effective implementation. Critical to achieving sustainability in the sectors are plans to track environmental, social and governance key performance indicators (KPIs) as part of performance measurement and decision support, obtaining environmental certifications and compliance, and conducting external assurance. The sustainability facets are price, reliability, technology, effectiveness and environmental effects.

The sustainability is not only green, it has more than one colour!

References

*More information about the environmental sustainable goals available on; <https://sdgs.un.org/2030agenda>

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Distributed Ledger Technology – based Real Estates

A token represents a value that can be assigned and transferred to different addresses on Ethereum. While coins (ethers) are used directly for payment, tokens represent a digital part of an asset. An asset can also be an intangible or tangible asset.

Tokenization has a significant and positive impact on the real estate industry. This process will ultimately enable anyone to invest CHF 1,000 in a property, for example, and at some point to trade this investment for a tiny fee via an app on the smartphone device (just like trading a share of a blue chip share). We believe this is the direction in which real estate investments will go.

This is the new world of real estate investment, where efficiency, liquidity and customizability through smart contracts based on the blockchain take property investment possibilities to the mass market, such that virtually anyone can own a piece of any property that is offered. This also brings about a massive potential investment pool for property owners to source for liquidity as well. The following is what tokenization stands to bring to the real estate industry, in plain English, so you can be prepared for the coming wave of property ladder opportunities.

1. Splitting up

Splitting is the division of equity into smaller pieces for the purpose of selling. For example, if a building owner holds their property in full (no mortgage, no debt) and wishes to purchase another building to increase their property portfolio and generate more rental income, they may choose to tokenize their existing asset through the use of a security token offering (STO) in order to sell a percentage of their equity to purchase the second apartment building. They remain the majority owner; however, the investors who have jointly purchased the equity stake are now owners with a defined set of rights, such as dividends, voting privileges, equity appreciation and tradability.

The commercial real estate asset class has long had a high barrier of entry because there is usually a large upfront capital expenditure required. With a fractionalized property, the asset becomes democratized, and access is open to smaller investors.

Please note:

a STO is not the same thing as an initial coin offering (ICO).

ICOs offer investors a token, but this token doesn't necessarily represent ownership in the underlying asset or company. In many cases, the tokens sold are called "utility tokens" because they only have value on the company's platform. Buyers are therefore "investing" to support the project and with the hope that, as the platform grows, the value of the tokens will increase.

STOs are distinct from ICOs because the tokens sold (security tokens) represent ownership in a real asset. STO investors know the real value of the underlying asset they're buying and benefit from any future price appreciation in the asset.

2. Liquidity

As it relates to investing, liquidity is defined by how quickly an asset can be converted into cash. Assets such as stocks or bonds can be exchanged for cash quite quickly as compared to assets such as real estate.

When real estates are tokenized, the asset is unlocked to a global pool of potential investors and secondary markets for trading the fractionalized asset tokens facilitating additional liquidity. Liquid assets tend to command a premium in the marketplace, thus increasing the underlying asset value.

3. Cost Efficiency

This is among the greatest benefits that tokenization brings to any real estate deal. There are many intermediary costs and processes involved in any purchase, sale or lease transaction.

When utilizing a blockchain-based smart contract as the source of the transaction, these external, third-party costs are disintermediated, bringing about unprecedented efficiency to the process because the smart contract has already been loaded with all the information that these third-party players would contribute to the transaction. The smart contract now acts as the arbiter, broker and lawyer, and it performs exactly what is spelled out in the contract as it happens in real time, reducing deal friction and now: unnecessary costs.

Smart contracts also allow for automation. Many real estate transaction-related processes that facilitate a deal, such as document verification, and

Smart Contracts also allow for automation. A lot of real estate transactions that facilitate a deal, such as document verification, underwriting, compliance, escrow, legal, etc., all require a great deal of time and effort from other people. A blockchain-based smart-contract such as that used to tokenize properties makes these human interactions unnecessary because each process has been built into the code of the contract, and each action or performance obligation in the contract is instantly carried out, saving a great deal of time and money.

4. Transparency

One of the most easily recognizable features of a DTL (Distributed Ledger Technology) – based deal is the record keeping. Visible to all parties to the contract, immutable and secure, the underlying data, such as date and time stamps, payment and all other contractual obligations, is recorded on the blockchain at each step of the deal process, ensuring that every facet of the investment is clearly linked to its underlying value driver.

The tokenization of real estate assets is flipping the equity and liquidity paradigm that has long limited real estate investment to the elite class of investors. As we move forward

into this revolutionary new world of tokenized real estate assets, we will experience a sea change in the ways developers raise capital, investors diversify their portfolios and owners liberate their equity.

5. Limitations

However, the blockchain is neither perfect nor free of limitations. Even if the openness of the blockchain and absence of any form of central control are the fundamentals of its functioning, it can cause limitations of its adoption. The most important technical limitations of the blockchain are still in general:

- Limited scalability
- The security models
- High costs

The issue of high costs is related to the problem of limited scalability. Solving the hash puzzle or providing the proof of work is computationally expensive on purpose. The magnitude of the costs depends on the difficulty of the hash puzzles.

The most important non-technical limitations of the blockchain are:

- Legal acceptance
- User acceptance.

Technical limitations of the DTL can be overcome by improving the existing technology or by introducing conceptual changes. Regarding non-technical limitations of the DTL, they can be overcome by educational and legislative initiatives.

In September 2020, the Swiss Parliament approved the new regulations for Blockchain and Distributed Ledger Technology (DLT Framework). Thereby, Switzerland has taken a further step to remain a key jurisdiction for FinTech, Blockchain and DLT Technologies and respective projects.

On February 1st the new legal framework started into force: The issuance of the newly introduced DLT-securities shall be possible. In August 2021, the remaining parts of the new regulations entered force.

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Education and investor protection are important elements of the ecosystem. Therefore, the team from Calanni Estate Consulting AG is working intensively with PropTech Academy to provide more solutions to increase transparency in the digital real estate industry.

PropTech & Insurance Sector

The Opportunity

In the last three years, the technology has evolved at a much faster pace than the evolution of many of the traditional businesses such as insurance and Real Estate. The adaptation of technology by consumers has forced businesses to change, rethink & redesign their operating models. This change has been further spurred by the covid19 pandemic, and the real estate sector was worst hit when the entire world went into lockdown, and commercial properties were shut down and didn't witness any footfall in 2020 and most part of H2 2021.

The loss of rent, new project development cost, etc. forced companies to optimise the building space and reduce the building insurance as well as liability insurance premiums. Several PropTech Startups have been working to support businesses to inform decision makers on the maximum staff can be accommodated in a building by leveraging sensors and IOT devices, so that safety and security of the staff can be maintained. The growth in PropTech is expected to continue with the same momentum as it's been in the last two years, and further proliferation of IOT sensors would be creating more opportunities for the real estate sector.

The Challenges

The real estate sector has been a manual and labour-intensive sector where technology has been the least invasive. However, this sector is also seeing new challenges posed due to technology and starting to adopt it slowly. At the same time, the insurance sector has embraced itself for the new challenges but is still lacking in designing new business models to accurately price the risks for buildings which are using new PropTech designs & resources.

Security:

The use of IOT sensors creates new ways of doing business, but it also brings cyber security risks when unattended, which can pose massive threats to business existence.

Skills:

The majority of workforces in the real estate sector are unskilled and training them for the usage of future technology and its implementation is still in a very nascent stage.

Learning:

The opportunity to learn new skills by the real estate sector workforce is very minimal. The universities and curriculum prescribed are mostly outdated. The new-age learning mechanism and tools aren't catering to the needs of the workforce of this sector.

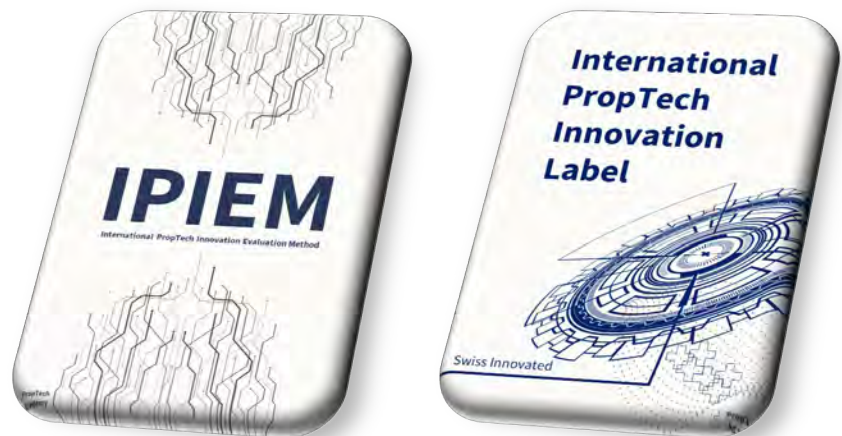
The Way Forward

The real estate sector will be seeing a different operating model as it's seen in the past decade and centuries, as consumers would be moving away from traditional ways of doing things.

buying and selling things. The way forward would be a marriage between incumbents and new entrants in the form of PropTechs and InsurTechs, and to be successful –

- Real Estate & Insurance industries will see new operating models led by digital changes and thus invite new entrants who are tech savvy in the form of PropTechs and InsurTechs. The collaboration between current market leaders and new technology-led startups would drive the growth agenda for the future.
- The shift in consumer behaviours & needs would force the businesses to create new products and services to meet those needs. For example, the Real Estate sector would be focusing on creating more warehouses, whereas the Insurance sector would be creating new standalone cyber insurance products.
- The new growth in the sectors would lead to the creation of new courses, learning materials, etc. which would be embraced by the real estate universities and learning platforms, and insurers will be creating new actuarial models to read building data automatically and price the insurance risk accordingly.

INTERNATIONAL PROPTech INNOVATION LABEL



Setting new PropTech Standards

The PropTech Innovation Ranking is not a conventional company evaluation process. Neither is it a traditional measure of innovation. And it does not aim to solely analyze and evaluate start-ups. Instead, it has been created with the goal of evaluating any and every company in the real estate, construction or finance sectors. Crucially, it is also based on the world's first-ever PropTech innovation evaluation process.

The “PropTech Innovation Ranking’ evaluation process forms part of the International PropTech Standards, which were developed and launched by the PropTech Academy Association in 2020.

The Association is a regulatory institution that aims to promote an international standardization and evaluation process for PropTech companies in the real estate, construction and finance sectors.

The International PropTech Standards are designed to serve as quality management system for PropTech companies. They set out the requirements that a specific type of product, component, system, service or process must fulfil in order for it to qualify as ‘fit for purpose’. The standards encompass methods of testing, terminology and definitions, as well as information requirements and the compatibility of various connections.

The standards are established by consensus and approved by recognized standardization bodies. They provide individuals, businesses and all types of organizations with a common basis for mutual understanding. They are especially useful for communications, measurement, commerce and manufacturing. In particular, they facilitate trade by ensuring the compatibility and interoperability of components, products and services – delivering benefits for businesses and consumers as a result of lower costs, enhanced performance and increased safety.

The primary objective of standardization is the definition of voluntary technology, innovation, sustainability or quality specifications that current or future products, manufacturing processes or services can comply with. Standardization can encompass various areas – from the standardization of different grades of service and products to the creation of consistent technological specifications for product or services in markets where compatibility and interoperability with other products or services are essential.

The International PropTech Standards were established in cooperation with leading universities and institutions. The Standards Committee is an independent and politically neutral body based in Switzerland.

PropTech Innovation evaluation process



In connection with the International PropTech Standards, the PropTech Academy Association has developed a new methodology to evaluate companies based on their level of innovation. It encompasses 12 categories and more than 100 criteria for the real estate, construction and finance sectors.

There are three criteria that must be met for an innovation to be successful:

Innovation is work. It requires knowledge, ingenuity, creativity, etc. Besides, innovators rarely work in more than one area – be it finance, real estate, construction or another sector. Their work requires diligence, perseverance and commitment.

Innovation has an effect in economy and society. It involves a change in the behavior of clients, teachers, farmers, doctors – in other words, the community as a whole. Innovation may also involve a change in a process, in the way people work or how they manufacture products. Innovation must always be close to the market, focused on the market and market-driven.

Innovation is, by its very nature, a high-risk undertaking, as is all economic activity. Innovators define risks and seek to minimize them. Innovations are successful when they

systematically identify sources of opportunity and then exploit them – whether they entail a small and quantifiable risk or a larger but still quantifiable risk. Successful innovators take a conservative view of risk while focusing on realizing opportunities.

The ‘PropTech Innovation’ evaluation process does not solely encompass classic definitions of innovation and general market requirements. Instead, it involves a new methodology developed using specific definitions of PropTech sectors and factoring in aspects such as uniqueness, disruption, technology and human capital in the real estate, construction and finance sectors.

The evaluation method uses subjective criteria when assigning the score. It evaluates a range of data based on official and public company information – including presentations, whitepapers, the CVs of founders and the management team balance sheet, usage cases, websites and other information.

The evaluation processes covers 12 main categories;

1. Uniqueness

- The business models, services and products must be unique and not easy to replicate.
- New product and not easy to copy,
- New service and not easy to copy,
- A new business model and not easy to copy,
- Recognition value.

2. Disruption

The new business model, service or product must create a new market or replace an existing one.

- Creating a new market,
- Potential to replace existing product or service,
- Potential to change life and work styles,
- Potential to change business models,
- New solutions fill all market gaps and serve all participants,
- Through quality raising, offering new payable solutions.

3. Technology

New technological solutions must be developed and delivered in response to current needs and knowledge.

- Producing own devices and tools,
- New products based on scientific breakthroughs,
- Enhancing the digital transformation in industry,
- Changing Work-Flow Management,
- Changing Time Management ,
- New technology must integrate with existing solutions,
- New technology must be resilient against cyber-attacks,
- Services and products must be transparent,
- Creation of transparency through users,
- Network readiness.

4. Human capital

Human capital is an essential driver of innovation and invention. Employees must be educated, experienced and creative.

- 5 years of sector experience,
- Education in sectors,
- Market knowledge,
- Research Skills,
- Ability to develop service and product,
- Ability to define technologies,
- Ability to define sustainability in sectors,
- PropTech knowledge,
- Fielding an experienced executive team,
- Learn entrepreneurship skills.

5. Process optimization

The business models, services and products must enhance lifestyles and working methods.

- Improvement in the use case,
- Reducing time and cost.

6. Sustainability

The business models, services and products must have environmental, social and/or economic benefits.

- Ecological benefits,
- Social benefits,
- reducing bureaucracy,
- Smart using of resources.

7. Functionality

The products must be modular, appropriate and capable of interacting with designated systems.

- Appropriateness: suitability of functions for specific tasks,
- Interoperability: Ability to interact with given systems,
- Conformity: Ability of the product to comply with standards, conventions or legal provisions and similar regulations with regard to functionality,
- Compliance: Features of software that ensure that the software/product fulfils application-specific standards,
- Life cycle assessment

8. Compatibility

The business models, services and products must be compatible with current technologies and needs.

- The service and product must be compatible with current technologies,
- Service and products must be suitable with current knowledge,
- Products should be designed modularly. It should be possible to take them apart for reparation or replacement of a part,

- ✓ Different products and components are mutually compatible and will function properly when connected together.

9. Feasibility

The solutions must be feasible, understandable and unambiguous.

- ✓ The services must be understandable and unambiguous,
- ✓ The qualifications, experience and competence to implement,
- ✓ Economically,
- ✓ Feasibility - is the technological approach feasible in principle?
- ✓ Technical risks - are the project challenges manageable?
- ✓ Clear guidelines for using.

10. Reliability

The solutions must be stable and effective over the long term and lead to an increase in employee and client satisfaction.

- ✓ Acceleration of business,
- ✓ Increase in employee satisfaction,
- ✓ increase in customer satisfaction,
- ✓ Long life using possibility,
- ✓ Are sufficient resources provided? Or a stop-and-go policy?

11. Market needs

The services and products must meet market needs and close gaps, offering a wide range of applications.

- ✓ A wide range of applications,
- ✓ Payable prices,
- ✓ adaptability to changes in the market,
- ✓ Serve a critical market need.

12. Solving problems

The business models, services and products must address or resolve a specific problem. Using these categories and basic criteria, the companies are evaluated according to their business model, service and product. Each category has its own characteristic criteria.

- ✓ Solving the right problem,
- ✓ Knowledge of the problems,
- ✓ Address a specific problem.

The PropTech Innovation story

The PropTech Innovation evaluation method was developed in Switzerland and is the first process of its kind in the world. It was used in the creation of the International PropTech Standards. The methodology symbolizes innovation and invention.

The PropTech Innovation Label can provide significant advantages for companies. It serves as an international hallmark or quality seal – making it easier for them to operate beyond their domestic market – thus geographically expanding their activities and

opening up new sources of sales and revenues. Businesses using a PropTech Innovation Label benefit from an enhanced image and can demonstrate to existing and prospective clients around the world that they operate in compliance with specific standards. For many clients and consumers, this is a sign that the companies in question offer excellent products and services in terms of quality, consistency and safety.

The PropTech Innovation Label provides clear guidelines and instructions which, when correctly applied, should ensure that a service or product will satisfy a series of specific quality, innovation, technology and sustainability criteria. This, in turn, can help to drive enhanced performance and reliability – allowing you to attract and retain clients and making your business more competitive and successful.

The PropTech Innovation Ranking is a useful tool for ensuring that different products and components are mutually compatible and will function properly when connected – whether you are considering your own range of products and services or those offered by other companies and organizations.

Higher levels of client confidence and satisfaction

Gaining the confidence of your clients and keeping them satisfied is crucial for the long-term success of your business. The PropTech Innovation Label can help you realize these goals by enabling you to maintain high levels of quality throughout the product development and manufacturing process, or when delivering a service. If your clients are confident about your ability to supply high-quality products or services in an efficient and consistent way, they are more likely to continue buying your products, using your services and supporting your business.

Improved market access as a result of increased competitiveness and efficiency, reduced trading costs, simplified contractual agreements and increased quality.

Easier launch of innovative products due to interoperability between new and existing products, services and processes. Examples include buildings lifecycle management, workflow management, energy efficiency, reduction of CO2 emissions, smart cities and smart buildings.

The PropTech Innovation Label can make an important contribution to the development of sustainable industrial policy, unlock the potential of innovative markets and strengthen the position of PropTech in the real estate, construction and finance sectors. It provides a solid platform that can be used to build and disseminate innovative technologies and enhance business practices.

Build better business with the PropTech Innovation Label

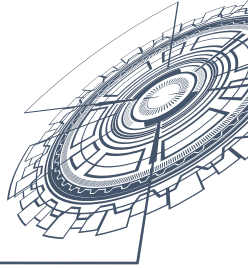
The PropTech Academy's central platform – encompassing the construction, real estate and finance sectors – provides a combination of innovation, technology and sustainability. As a unique innovative space, the Academy's primary objective is to create an intellectual community of multi-disciplinary professionals to conduct specialist work on innovation that can positively influence the development of these sectors.

At the same time, the PropTech Academy is a regulatory institution that aims to create international standardization and evaluation processes for PropTech companies in the real estate, construction and finance sectors that require quality management systems. These companies set out the requirements that a particular product, service or process must fulfill to qualify as 'fit for purpose.'

More information about the label and process is available on; www.proptechacademy.ch

International PropTech Innovation Map

3rd. Edition, June 2021



INTERNATIONAL PROPTECH STANDARDS

Standards?

Norms?

Guidelines?

Regulation of real estate and construction sectors?

PropTech Academy and PropTech Switzerland teams have developed (invented) the first international PropTech standards to regulate the real estate and construction sectors in the world.

The PropTech sector is 10 years old now. Naturally, it all began with digitization and the internet early in 2000.

There are more than 8.000 tech companies in real estate and construction sectors now, and more companies are coming year and year. Currently, standards and norms do not cover the new sector “PropTech” and also the new companies according to the business models, services and products.

The currently regulation institutions do not have compatible regulation process and standards for that new business area. There are a few international institutions who offer classical certification process for the companies in all sectors. But they do not have special criteria and evaluation method for the real estate and construction companies. In real estate sector there are some other organizations which certificate only individuals with general real estate market criteria.

The new market “PropTech” needs new rules, new standards and new norms for the markets and market players. PropTech (property technology) contains the lifecycle of building and consists of technology, innovation and sustainability. It is not part of the existing real estate, construction and finance sectors. It is a major sector which connects three sectors. PropTech will change the identity of the existing and also established companies in these markets. After 10 years there will be more than 30.000 tech companies in these sectors worldwide.

The important question is; “How we can control the new market and regulate the new companies and new business areas? For thousands of years the human needed the regulation or rules to live together and work together. After the industrial revolution

the governments and official institutions started to regulate the markets and set the standards on how we work and trade. The standards and norms had had important positions in the die industries in the early 60's. The crisis, inflations, devaluations and the other impacts brought strong regulations to the markets.

Because of these reasons, the future market "PropTech" should be regulated. We realized the needs and gaps at the beginning of 2018 and started to write the first standards for the PropTech Market. At first, the PropTech itself and its categories are defined. In July 2019 the first edition of "International PropTech Standards" is released. In 2020 the standards have been revised and the first certification process for the companies developed. (See Figure 1 on the next page).

The standards are written for the evaluation and regulation of PropTech companies. They set out the requirements that a particular kind of product, service or process must fulfil, in order to establish that it is 'fit for purpose'. However, the standards relate to methods of testing, terminology and definitions, information requirements, or the compatibility of connections.

A standard is a basic document that sets out requirements for a specific item, material, component, system or service, or describes in detail a particular method or procedure. Standards are established by consensus and approved by recognized standardization bodies. Standards provide individuals, businesses and all kinds of organizations with a common basis for mutual understanding. They are especially useful for communication, measurement, commerce and manufacturing. They make trade easier by ensuring compatibility and interoperability of components, products and services. They bring benefits to businesses and consumers in terms of reducing costs, enhancing performance and improving safety.

The primary objective of standardization is the definition of voluntary technology, innovation, sustainability or quality specifications with which current or future products, production processes or services may comply. Standardization can cover various issues, such as standardization of different grades of service and products or technological specifications in product or services markets where compatibility and interoperability with other products or services are essential.

The benefits of Standards

International Standards mean that consumers can have confidence that the products and services are reliable and of good quality. The PropTech certificate can be great for companies because an international recognition offers the possibility of operating beyond national borders, which means that companies can increase their sales and revenue. Companies with an PropTech label use this to improve their image and show the rest of the world that they work in conformity with international standards. For many buyers and customers, this is a sign that the companies offer excellent products and services. The PropTech standards attempt to ensure quality, consistency, and safety and show us how to check for quality. There are many benefits for businesses which embrace these standards.

The history of the Standards



December 2020
The standards have been revised



October 2020
The highest certification process has been for the evaluation of the companies developed.



Juli 2020
The first edition of International PropTech Standards is released
it was the important moment and step to try standardization of the companies and sectors.



March 2020
Research and Study of PropTech Sector
PropTech and its categories have been defined. It was the first academical investigation of PropTech.



September 2019
The first PropTech book: "PropTech 2020"
Everything began with the „PropTech 2020“ book. When we started to write the book, we noticed that there were no right definitions, no right categorizations and no standards for this new world.
„Why don't we write the standards for the PropTech sector?“ Everything began with that question. We didn't know that we were writing the history.

Figure 1

Standards and norms provide clear guidelines and instructions that, when correctly applied, should ensure that a service or product will satisfy a series of specific quality, innovation, technology and sustainability criteria, corresponding with customers' requirements. By implementing the relevant standards, you can achieve better levels of performance and reliability. This will help you to attract and retain customers for your products and services, thereby making your business more competitive and successful.

Standards are a useful tool for ensuring that different products and components are mutually compatible and will function properly when connected together. By paying close attention to standards, you can make sure that all the products and services you provide are compatible with each other, and that they will also work with products and services offered by other companies and organizations.

Standards provide precise and widely-accepted descriptions of components, products and services. They make it possible for every link in the supply chain to share common understanding of the exact requirements that need to be fulfilled. By including references to specific standards in product catalogues, calls for tender, supply contracts and purchase agreements, you can insist that suppliers respect these requirements, and you can also make sure that the products and/or services you provide will correspond to your customers' expectations.

Gaining the confidence of your customers and keeping them satisfied is crucial for the success of your business. Standards can help you to achieve these goals because they enable you to maintain high levels of quality throughout the production process and development, or when you deliver a service. When your customers are confident in your ability to provide high-quality products or services in an efficient and consistent way, they will be more likely to continue buying your products, using your services, and supporting your business.

Improved market access as a result of increased competitiveness and efficiency, reduced trading costs, simplified contractual agreements, and increased quality.

Easier introduction of innovative products provided by interoperability between new and existing products, services, and processes - for example in the field of the lifecycle of building, workflow management, energy efficiency, co2 reducing, smart cities, smart buildings.

Help to bridge the gap between research and marketable products or services.

Standardization can make an important contribution to the development of sustainable industrial policy, unlock the potential of innovative markets, and strengthen the position of PropTech in real estate, construction and finance sectors. It brings a solid foundation to build and disseminate innovative technologies and enhance business practices.

By using International Standards, your business can take full advantage of the Single Market and reach out to potential consumers all around the world.

Standards and norms provide clear guidelines and instructions that, when correctly applied, should ensure that a service or product will satisfy a series of specific quality, innovation, technology and sustainability criteria, corresponding with customers' requirements. By implementing the relevant standards, you can achieve better levels of performance and reliability. This will help you to attract and retain customers for your products and services, thereby making your business more competitive and successful. Alongside the direct benefits of using standards, there can also be indirect benefits that are just as important for the long-term success of your business. Standards are a way of showing to the world that you are committed to excellence – not just in the quality of your products and/or services – but also in terms of technology, innovation, sustainability etc. Companies and organizations that make correct use of standards experience real benefits in how they are perceived by their customers, their stakeholders, and the wider community (public authorities, media, civil society, business sectors etc.)

The PropTech Standards benefit organizations that want to commercialize emerging technologies. These standards help businesses to establish the core characteristics of quality products or services. By implementing PropTech standards, you demonstrate your credentials to your customers, your employees, your investors and other stakeholders.



Entrepreneurship
and
Venture Capital

Funding

Venture Capital

The concept of venture capital is based on the core premise that the investor provides equity, or securities with a very similar risk, but also a similar return prospect as the entrepreneur himself invests. There is no collateral like in the banking sector. And this is the only way entrepreneurs who do not already own several houses to pledge or, to put it bluntly, have inherited as substantial, receive capital. In a nutshell, you only get money from the bank if you already have it, which in economic terms creates only very limited value.

The venture capital/ equity investor thus participates in the company and receives shares in this company accordingly. Thus, the interests of the entrepreneur and the investor are basically the same because both sides benefit directly from the success. At least that was the theory. The practice is - as is often the case - "slightly" more complex: Achieving the most harmonious cooperation possible between entrepreneur and investor is both, art and science, and is made even more complicated by the fact that, as a rule, after financing is before financing, an entrepreneur has to coordinate a large number of investors, some with very different investment motives and horizons. Also the relationship between the entrepreneurs themselves – because statistically about 73% of the start-ups in Switzerland are not solo start-ups, but teamwork – experience shows that it is not always peace, joy, pancakes because a few life situations are more stressful and therefore more prone to conflict than the first few years of starting a business.

Taillight

In an economic age that is undoubtedly dominated by increasing technology and digitization, the word innovation is inevitably associated with the USA, especially with Silicon Valley. Four of the five most valuable companies globally in terms of their market capitalization are currently American digital corporations: Apple, Alphabet (the Google umbrella company), Microsoft, and Facebook. Since then, the idea of innovation has also been a fundamental component of Swiss economic strength.

At the beginning of the digital age in Switzerland, no globally groundbreaking group like Google or Facebook has emerged. This is undoubtedly due at least in part to the comparatively weak venture capital market in this country and thus to the lack of equity culture. In the USA, based on the gross domestic product per capita, eight to three times more risk capital is invested (depending on the study) than in Switzerland.

Real estate is the largest asset class globally, and therefore, the market potential is enormous. Transactions of several hundred million euros are taking place here. If a startup can improve such transactions, the added value is much greater than, for example, in e-commerce, where your shopping cart may only be 100 euros. But in the end, diversification is a must.

Today there is still a big gap between Europe and the USA in the area of venture capital. The reasons are in the business culture as well as in legal regulations. While in the USA, for example, the "Prudent Man Rule" was relaxed in 1978, which enabled pension funds to invest in the venture capital asset class. In Switzerland, only 0.02 percent of funds are invested in venture capital. In the US, pension funds invest up to 5% of their investments in venture capital funds – they do so with a long-term perspective and above-average returns.

France set the course for "pro" venture capital years ago. In 1997, our neighboring country implemented an attractive tax incentive system with the establishment of the FCPI / FIP funds. This means that almost every high-income French person inevitably receives at least a few thousand euros per year in a venture capital fund from their tax advisor to invest in getting up to 50% of this investment reimbursed through income and wealth tax. This has not only led to the fact that in France, in addition to the traditional VC funds that still exist, up to EUR 1 billion is invested in tax-subsidized funds by private investors. Furthermore, venture capital in France has been moved out of the elite niche as an investment product for only the wealthiest families. It is now a democratic mass product for everyone, which, especially in times of low and negative interest rates, also contributes to one's wealth creation and economic security towards retirement and retirement can afford.

Despite good signals, the Swiss venture capital market remains a comparatively underdeveloped emerging market. But it doesn't have to be a disadvantage. In Switzerland, we work all the more cost-effectively.

Fintech vs. PropTech

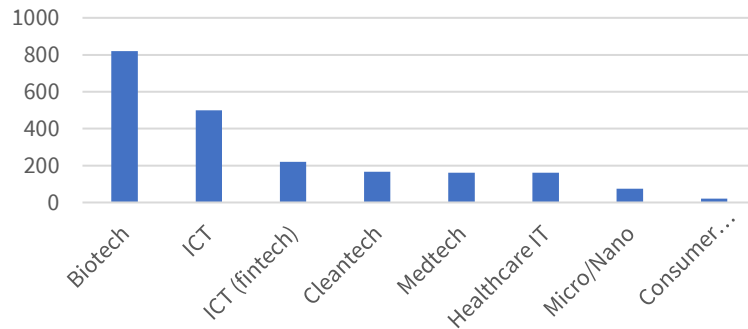
Compared to FinTech, the investment universe is still relatively young. PropTech Academy has already looked at over 1500 of approx. 8000 companies. Many other interesting startups will be developed in this area. There are the so-called experts who have said that the transition of the immense real estate industry into the digital age will last at least 20 years. We think it will happen twice as fast.

In Switzerland, financing in startups is still very opaque, and more precise details are only known about a few financings. In many studies, only the ICT and Fintech area is covered, although it is known that there could also be some PropTech companies among them.

According to VC Reports 21, startupticker.ch in 2020 the life sciences sector set new records, significantly less investment was made in ICT and fintech start-ups than in 2019 due to the lack of mega-rounds. In contrast, the number of financing rounds continued to rise.

The money invested in 2020 in Fintech grew to well over CHF 220 million, with a share of 10.4% of all investments.

Invested capital by sector Share of FinTech 10.4%



Source: VC Report 2021, startupticker.ch

Funding 2013

According to public informations 1 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

DomoSafety SA	
Category	Smart Buildings & IoT
Phase	early stage
Amount (CHF m)	0.9 m
Investor	Networks of Business Angels Suisse Romande, investiere, A3 Angels club, GoBeyond and other private investors

Funding 2014

According to public information 3 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

dizmo AG	
Category	Smart Buildings & IoT
Phase	Early stage
Amount (CHF m)	1.8 m
Investor	Private Investors

Movu AG	
Category	Property Management
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Private Investors

Real Estate Digital AG	
Category	Big Data Analytics
Phase	seed
Amount (CHF m)	n.a.
Investor	Private Investors

Funding 2015

According to public information 3 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

Movu AG	
Category	Property Management
Phase	early stage
Amount (CHF m)	n.a.
Investor	Go Beyond, Ringier Digital Ventures, BTOV, Private Investors

Archilogic AG	
Category	Virtual Reality
Phase	n.a.
Amount (CHF m)	1.4 m
Investor	n.a.

Locatee AG	
Category	Property Management
Phase	early stage
Amount (CHF m)	n.a.
Investor	Private Investors

Funding 2016

According to public informations 6 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

Alltings Technologies AG	
Category	Property Management
Phase	Later stage
Amount (CHF m)	2 m
Investor	Private Investors

DomoSafety SA	
Category	Smart Buildings & IoT
Phase	later stage
Amount (CHF m)	2 m
Investor	Private Investors, Investiere, Polytech Ventures, Go Beyond

eSmart Technologies SA	
Category	Smart Buildings & IoT
Phase	Early stage
Amount (CHF m)	1.5 m
Investor	GVB, Sojus Holding, BAS, Private Investors

Flatfox AG	
Category	Property Management
Phase	seed
Amount (CHF m)	n.a.
Investor	BAS

Movu AG	
Category	Property Management
Phase	Later stage
Amount (CHF m)	n.a.
Investor	Ringier Digital Ventures, BTOV, Go Beyond, Private Investors

Tilbago	
Category	Real Estate FinTech
Phase	Early stage
Amount (CHF m)	n.a.
Investor	PostFinance

Funding 2017

According to public informations 7 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

Allthings Technologies AG	
Category	Property Management
Phase	Later stage
Amount (CHF m)	2.5 m
Investor	Creathor Venture, Private Investors

Cashare AG	
Category	Real Estate FinTech
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Private Investor

GuestReady AG	
Category	Marketplace
Phase	Early stage
Amount (CHF m)	3 m
Investor	Impulse VC, Boost Heroes, Senn & Partner, Swiss Founders Fund

Perspective Robotics AG	
Category	Air Vehicles, Drones
Phase	
Amount (CHF m)	n.a.
Investor	SICTIC Investors

Perspective Robotics AG	
Category	Air Vehicles - Drones
Phase	Early stage
Amount (CHF m)	n.a.
Investor	SICTIC, Go Beyond community

PriceHubble AG	
Category	Valuation
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Helvetia, Swiss Life, Swisscom, btov Network

Funding 2017

Senozon AG	
Category	Big Data Analytics
Phase	Later Stage
Amount (CHF m)	n.a.
Investor	Private Investors

Funding 2018

According to public informations 4 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

Creal SA	
Category	Virtual Reality
Phase	
Amount (CHF m)	0.9 m
Investor	SICTIC Investors

Hegias AG	
Category	Virtual Reality
Phase	
Amount (CHF m)	0.5 m
Investor	SICTIC Investors

Workspace2go AG	
Category	Property Management
Phase	
Amount (CHF m)	0.5 m
Investor	SICTIC Investors

The eLocations AG	
Category	Marketplace
Phase	
Amount (CHF m)	1m
Investor	Private Investor

Funding 2019

According to public informations 18 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

Allthings Technologies AG	
Category	Property Management
Phase	Later stage
Amount (CHF m)	13.7m
Investor	Earlybird, Idinvest, Kingstone Capital, Creathor

Archilyse AG	
Category	Construction
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Ringier Digital Ventures, PropTech1 Ventures, ZKB, btov, private investor

CREAL3D SA	
Category	Virtual Reality & 3D
Phase	n.a.
Amount (CHF m)	4.3 m
Investor	SICTIC, Atmosclear Investments, Business Angels Switzerland, private investors

eLocations AG	
Category	Marketplace
Phase	seed
Amount (CHF m)	1m
Investor	Private investor

Flatfox AG	
Category	Marketplace
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Helvetia Venture Fund, Ringier Digital Ventures, Investis, btov

ready data AG, Immoledo	
Category	Property Management
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Helvetia Venture Fund

Funding 2019

Vermando AG	
Category	Marketplace
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Private investor

Workspace2go AG	
Category	Marketplace
Phase	seed
Amount (CHF m)	0,5m
Investor	SICTIC

AgentSelly AG	
Category	Marketplace
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Valiant Bank

PropTech Partners SA, Neho	
Category	Marketplace
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Ringier Digital Ventures, PropTech1 Ventures, ZKB, btov, private investor

YetiVisit SA	
Category	Virtual Reality & 3D
Phase	Early Stage
Amount (CHF m)	n.a.
Investor	Investis

Involi SA	
Category	Drones
Phase	Seed
Amount (CHF m)	0.5 m
Investor	Institutional Investors

Funding 2019

Perstpective Robotics AG	
Category	Drones
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Go Beyond community, Sony Innovation Fund

Vermando AG	
Category	Marketplace
Phase	Early Stage
Amount (CHF m)	n.a.
Investor	Private Investor

Cleveron AG	
Category	Smart Buildings & IoT
Phase	Seed
Amount (CHF m)	0.7 m
Investor	Private Investor

Creal SA	
Category	Virtual Reality
Phase	Early stage
Amount (CHF m)	4.3 m
Investor	investiere, DAA Capital, SICTIC

eMonitor	
Category	Virtual Reality & 3D
Phase	Early stage
Amount (CHF m)	n.a.
Investor	Investis

Hegias AG	
Category	Virtual Reality
Phase	n.a.
Amount (CHF m)	1.74 m
Investor	SICTIC Investors

Funding 2020

According to public informations 15 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

Locatee AG	
Category	Property Management
Phase	Series A
Amount (CHF m)	4 m
Investor	FYRFLY Venture Partners, Tomahawk VC

Archilyse AG	
Category	Construction
Phase	Series A
Amount (CHF m)	4 m
Investor	PropTech1 Ventures, Swiss Immo Lab

Tayo SA	
Category	Property Management
Phase	
Amount (CHF m)	Acquired 10% of the share capital
Investor	Romandie Energie

Mobbot SA	
Category	Construction
Phase	Seed
Amount (CHF m)	2.9 m
Investor	Mutschler Ventures, investiere, SwissimmoLab, Capital Risque Fribourg, NEST Pension Fund and business angels

eMonitor AG	
Category	Property Management
Phase	
Amount (CHF m)	1.06 m
Investor	Alpana Ventures, Platanus Holding AG, Stiftung Startfeld

Fairwalter AG	
Category	Property Management
Phase	
Amount (CHF m)	n.a.
Investor	Trea Venture

Founding 2020

GuestReady AG	
Category	Marketplace
Phase	Later Stage
Amount (CHF m)	6 m
Investor	Impulse VC, Cornelius Boersch, Swiss Founders Fund, Senn & Partner, Fortyone, Fortimo, Swiss and German business angels

Hegias AG	
Category	Virtual Reality
Phase	Early Stage
Amount (CHF m)	1,7 m
Investor	n.a.

Perspective Robotics AG	
Category	Drones
Phase	Later Stage
Amount (CHF m)	n.a.
Investor	Credit Suisse Entrepreneur Capital

Voliro AG	
Category	Drones
Phase	Seed
Amount (CHF m)	2.0 m
Investor	Alpana Ventures, Backbone Ventures and Zürcher Kantonalbank

Vermando AG	
Category	Construction
Phase	n.a.
Amount (CHF m)	n.a.
Investor	WIR Bank

Houzy AG	
Category	Property Management
Phase	n.a.
Amount (CHF m)	n.a.
Investor	UBS, Baloise Versicherung

Founding 2020

Habitects AG	
Category	Construction
Phase	n.a.
Amount (CHF m)	n.a.
Investor	Bringhen Gruppe

PriceHubble AG	
Category	Valuation Model
Phase	n.a.
Amount (CHF m)	n.a.
Investor	Helvetia Venture Fund, Swiss Life, SORAVIA, Frank Strauss

Soobr AG	
Category	Property Management
Phase	Seed
Amount (CHF m)	0.9m
Investor	Angel Investors

Funding 2021

According to public informations 5 PropTech companies have been financed by venture capitals or investors. A link to further information for each financing find you at the end of the text.

Smino	
Category	Construction
Phase	n.a.
Amount (CHF m)	n.a.
Investor	Axept Business Software AG

Parquary	
Category	Smart Buildings & IoT
Phase	n.a.
Amount (CHF m)	n.a.
Investor	VolkerWessels Group

Droople SA	
Category	Smart Buildings & IoT
Phase	n.a.
Amount (CHF m)	1.5m
Investor	n.a.

FenX	
Category	Smart Buildings & IoT
Phase	Seed
Amount (CHF m)	2.7m
Investor	TRfinanz Holding AG, ZKB, CADFEM International AG, Swiss Prime Site AG, the ETH Zurich Foundation, ValueBridge GmbH and CIMA Corporate Investment Management, Affentranger Holding SA.

Locatee AG	
Category	Property Management
Phase	n.a.
Amount (CHF m)	3.0m
Investor	Technology Fund

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Sources - Companies

Sources of the companies: The informations, photos and logos copied from the companies homepages 1to1 and they are original. All text and photos are belong the each PropTech companies and you can find more information in their sites. The companies introduced with their founding-story and some part of sites. The informations of the statistics researched and collected on the Sites of each companies.

Marketplace

Lightmove SA

Flatfox AG

AgentSelly AG

NEHO

Casasoft AG

Brixel AG

Kiiz

DealEstate

Investment

Crowdlitoken

Yeldo SA

Imvesters

Mybrick SA

SwissLending SA

Crowdhouse AG

Token Factory Switzerland

Foxstone SA

ClubEstate

Property Management

Huperty AG

Propbase AG

Soobr AG

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W&W Immo Informatik

readydata AG

eMonitor AG

Houzy AG

streamnow AG

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Homepad Solutions SA

Oxygen at Work AG

Allthings Technologies AG

ICFM AG

wy.by

eeproperty

Tayo Software

Crossing-Tech SA

Locatee

Novihome

Baroon

Fairwalter

FlatMan

Eglobe Solutions - godoo

Reamis

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BuildingPoint Schweiz AG

Realview AG

PlaniBIM SA

Smino

Inspacion AG

3-Plan Haustechnik AG

Fenx AG

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Kennwerte

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Parallel Digital SA

Abvent SA

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e-bau GmbH

planXD GmbH

Terradata AG

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E-NNO Switzerland SA

Smart Home SA

Droople SA

Ormera AG

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dizmo AG

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Geoimpact AG

eSMART Technologies SA

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Raumgleiter AG

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Nomoko AG

Immersive Business Advantage

Coding Mind AG

Perspective Robotics AG

Big Data Analytics

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Smart Visions GmbH

Archilyse AG

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Real Estate Digital AG

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Senozon

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FPRE

Wüest Partner AG

PriceHubble AG

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Real Estate FinTech

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Valuu

Swisspeers AG

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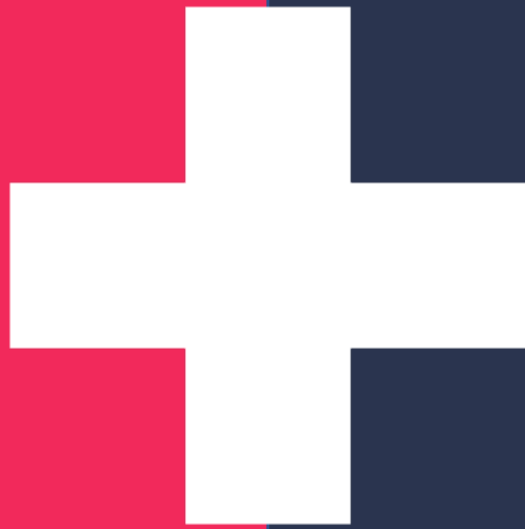
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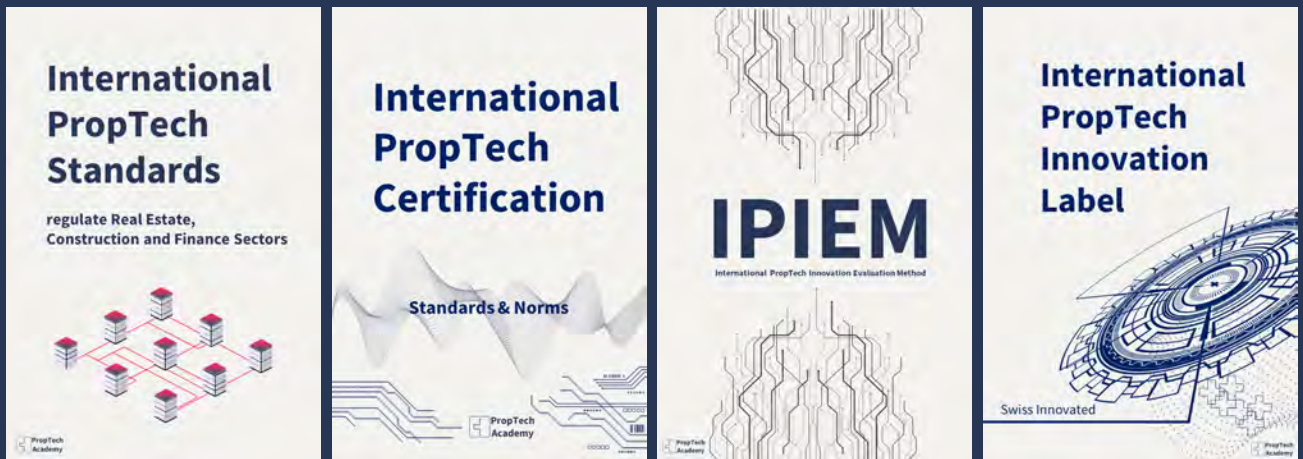
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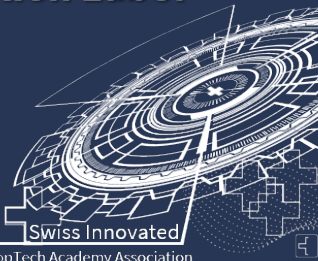
PropTech Academy

Competence Center of Property Technology



International PropTech Innovation Label

----- was being audited according to the PropTech innovation evaluation process and it has been confirmed that the company meets the respective innovation criteria.



This company has been certified with International PropTech Innovation Label by PropTech Academy Association and it has worldwide validity. Certificate No.: IPIL / 0000001 – Certificate Date: 10.03.2021 – Expiry Date: 10.03.2022 – Switzerland

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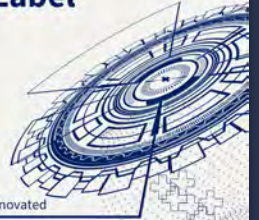
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