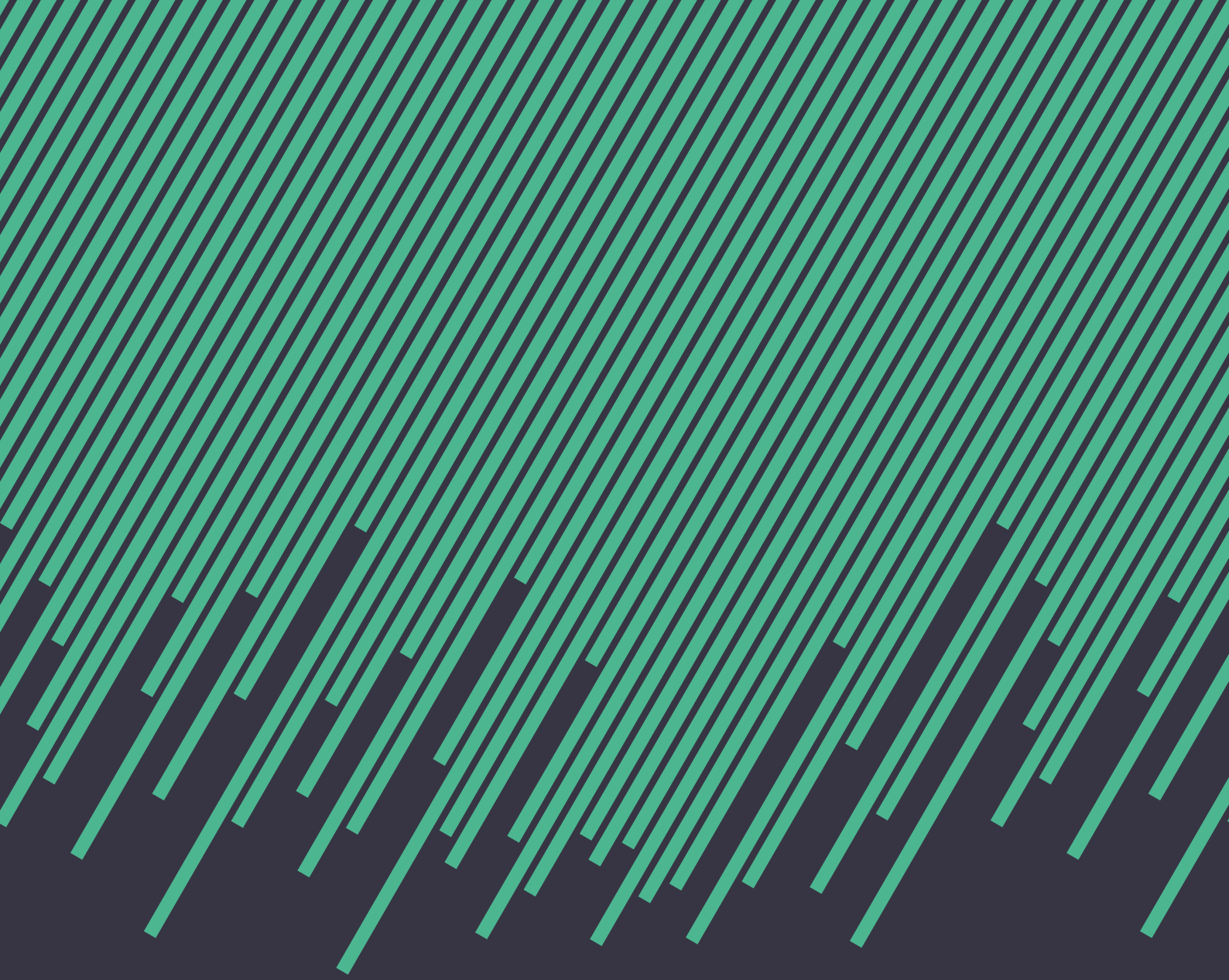

FIBREE Industry Report Blockchain Real Estate 2021

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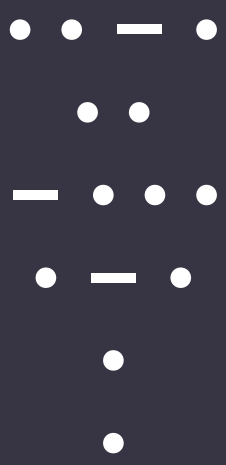

Editorial

Achim Jedelsky
Berlin, June 24, 2021

Dear reader,

our global network of regional chairs expanded further, with their regional networks we now reach for the first time more than 10.000 people worldwide. The 2021 FIBREE Industry Report is featuring a variety of topics that serve very well as a summary of last year's activities around blockchain and real estate. Next to the rather 'traditional' topics like land registry and tokenization the report also offers insights in the use of NFTs (Non-Fungible-Token), in DeFi (Decentralized Finance) and digital assets or sustainability and credit management.

The wide range of the featured articles is supported by the (again) rising number of products / startups in the space of blockchain and real estate. After we have seen a drop in the total number of validated products in 2020 (we counted less than 300), we found this year again close to 400 products worldwide.

But it is not the number alone that matters. These developed solutions are also much closer to market needs than in recent years. To run a blockchain startup alone doesn't automatically bring any customers or investors - rather the opposite. But the benefits that can be realised by distributed ledger technology are more and more of interest to the real estate market. Of course - to put this into perspective - we are still talking about early adoption, but the industry is better aware now of the potential of blockchain products than ever before. If suppliers are delivering a proven value proposition the adoption will follow, so FIBREE expects in the near future to see different examples that will enter the stage.

FIBREE is actively supporting this development by running an increasing number of pilot projects across the world. For the Unique Object Identity (UOI) alone we currently have 14 pilot projects in eight different countries. All of these projects help us refine the UOI concept and to create an open-source object identity that can be applied in any country of the world.

With the newly introduced concept of the FIBREE Challenge we created a framework to cooperate with industry players on specific topics and lower the entry barrier for companies or individuals in applying innovative solutions. The first endeavour on this new concept is the FIBREE Tokenization Challenge that will help to increase the number of tokenized real estate. Other FIBREE Challenges will follow in future in order to move the theoretical discussion to practical application of blockchain solutions.

And last but not least we are developing the FIBREE consultancy service that will match the competencies of the international FIBREE network with the many inquiries we receive from the real estate industry. Again FIBREE will work hard to facilitate solutions in order to further transform our industry and meet today's challenges.

Enjoy reading our report!

Achim Jedelsky
President of FIBREE

Imprint

The FIBREE Industry Report is the most important yearly contribution of FIBREE to the market. We provide you with in depth articles and a worldwide overview of the latest developments in the field of Blockchain and Real Estate.

For the creation of this 2021 edition a working group has been formed within FIBREE, consisting of the following people:

- *Florian Huber (Austria)*
- *Jo Bronckers (The Netherlands)*
- *Denis Petrovcic (Slovenia)*
- *Fabian Süß (Germany)*
- *Alessandro Dell'Orto (Italy)*
- *Federico Garaventa (Italy)*
- *Yael Tamar (Israel)*
- *Achim Jedelsky (Germany)*
- *Walter Strametz (Switzerland)*

Also special thanks for their contribution and effort to the editorial team and authors of all experts articles: Roland H. Farhat (Germany), Anetta Proskurovska (Luxembourg), Irina Karagyaur (UK), Alexander Appelmans (Belgium), Jose Reis Santos (Portugal), Walter Strametz (Switzerland), Christoph Urbanek (Austria), Armin Redl (Austria), Jan Veuger (The Netherlands), Evangelos S. Lianos (Greece), Stefanie Behrendt (Greece)

Design and layout

Maximilian Huber / www.eracht.at

Get in touch with FIBREE

FIBREE aims to continue the research and knowledge exchange about blockchain and real estate developments. FIBREE invites product-suppliers, real estate organisations, legal firms, startups, research organizations, press or other interested organizations that want to get in touch with FIBREE to reach out to us by sending your request to: ask@fibree.org

If you'd like to become a participant and eventually take an active role within FIBREE, or if you want to put your startup in the spotlight, please check the connect-part at our website fibree.org and subscribe to the engagement of your preference. Nothing of this publication may be reproduced without the prior written consent of FIBREE or without clear acknowledgement of the source.

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Winning the Transparency Game in Real Estate - and how a Distributed Ledger Technology can Help.

Author: Roland H. Farhat, FIBREE Chair - Frankfurt am Main (Germany)

Forward

After more than a year of the Covid-19 pandemic that ravaged the world through a deadly virus and confronted world economies with severe repercussions, the real estate business is awakening to new realities. Challenges erupted as a consequence of the Covid-19 virus in almost all property segments. More surprisingly, the public debate about sustainability gathered steam and more regulations were released or entered into force. Looking forward, real estate investors need to develop a holistic view towards strategy, continuously adapt their assumptions and goals, and incorporate technology to track not only the physical attributes of their assets but also the social and climate impacts. Using technologies wisely and consequently, these measures will allow real estate investment to become more transparent. With its underlying distributed ledger technology (DLT), blockchain can play a crucial role in encompassing and authenticating historical property data streams, and enhancing transparency. If real estate is to win in the new era of sustainable investment, real estate investors should build and cultivate a few relevant metrics rather than producing loose and incomprehensible amounts of data. In doing so, they will enable the establishment of a structured and uninterrupted audit trail

Introduction

Technology is increasingly integral to the world we live in, and real estate businesses need to deploy new technologies at scale to remain relevant. They must also master uncertain business conditions and tighten regulatory frameworks. Success

requires a holistic transformation spanning multiple layers of an organization's embrace of technology. Many companies, however, are struggling to experiment with select use cases of scaling blockchain across their organization. Reasons include the lack of a clear strategy for DLT and other new technologies, an inflexible technology core, fragmented data assets, and outmoded operating models. What is more, trends in sustainable investing have accelerated during the pandemic, and regulators are setting higher transparency and reporting standards. To compete successfully and thrive, incumbent real estate businesses must become "green-proof" institutions, adopting technologies like DLT as the foundation for new value propositions and distinctive customer experiences.

This article (1) highlights the general state of digitization in real estate organizations, the accelerated requirements of regulators in terms of sustainable investments, and recent answers by the real estate industry to reporting measures. It then (2) proposes a DLT-based solution to meet new transparency challenges and drafts the use case of sustainable investments.

Disconnection Between Data and Corporate Actions

In many FIBREE regional meetings, real estate professionals often reveal their frustration with the historical disconnect between the availability of data and the difficulty of harnessing it for quick, actionable insights. Real estate investors spent the last 10 to 15 years trying to improve the digital twinning of their portfolios, spending money on digitizing information and collecting data. Failures happened at different stages in the process, mainly: (1) Critical know-how was lost through the outsourcing of tasks at property level, and (2) building technical skills in silos within the organization. As if this was not enough, already available data in companies oftentimes didn't meet the kind of information and key metrics requirements from regulators. This is generally the case when it comes to proving the sustainability of investment portfolios.

Hardening Reports Frameworks

Since the financial crisis in 2007, authorities around the world have been steadily and consequently increasing requirements on reporting at regulated institutions. The European Commission (EC) recently proposed on April 21, 2021, the Corporate Sustainability Reporting Directive[1] (CSRD) to strengthen sustainability reporting. This directive requires companies to share more targeted, reliable, and easily accessible information as the basis for sustainable decision-making. The CSRD proposes enlarging the scope of information to cover more companies that significantly impact the environment and society, e.g. in the real estate sector. The EC proposed digitalizing sustainability information which will improve the access and efficiency of corporate reporting, but stopped short of setting common European sustainability reporting standards. Most importantly, the EC will now require third-party independent assurance over sustainability reporting, echoing investors' needs for third-party independent assurance to make sustainability reports more credible.

Reflections on Published Reports

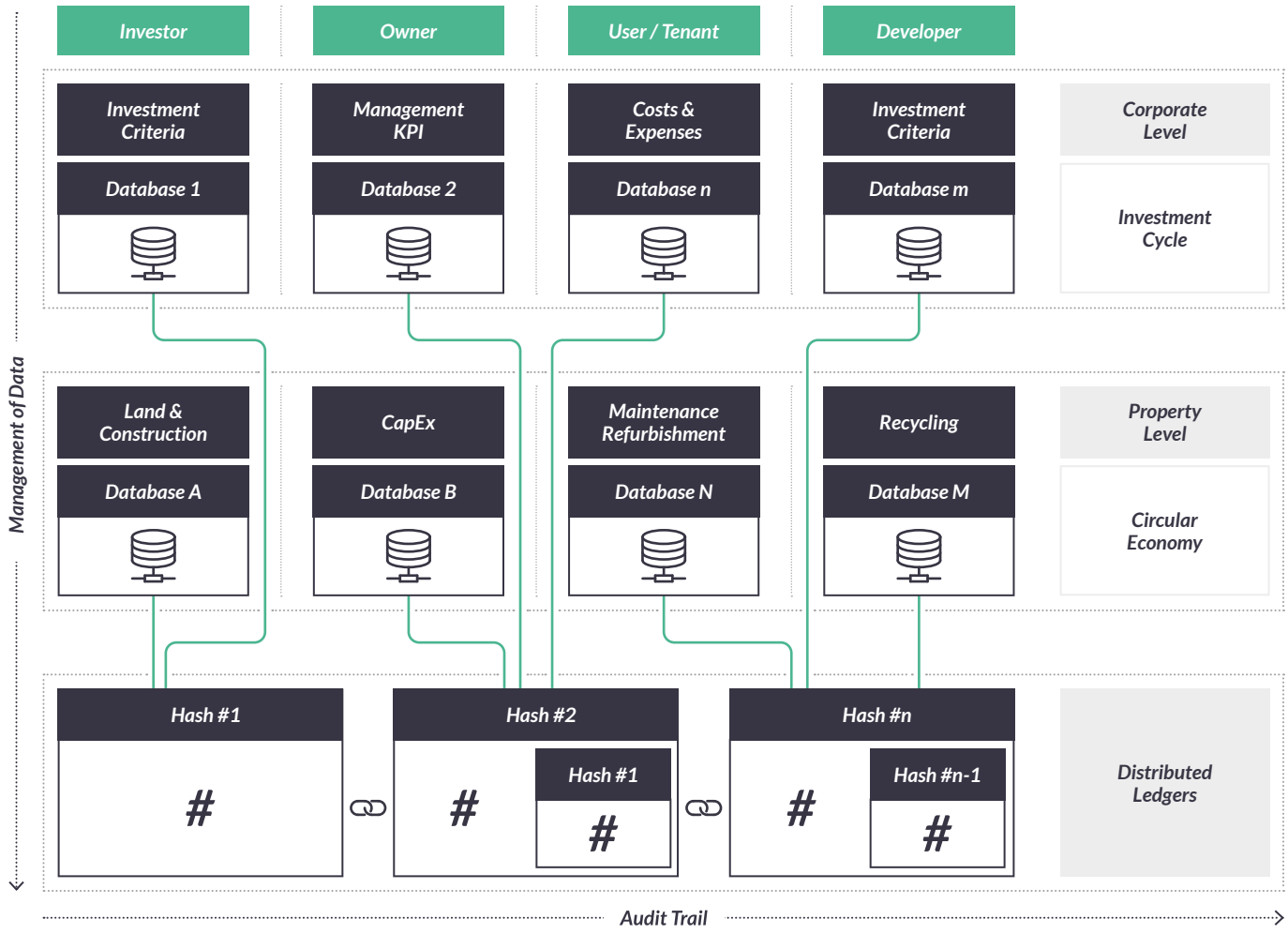
In 2016, the Global Reporting Initiative (GRI) first published standards that can be used by an organization of any size, type, sector, or geographic location when using the GRI standards to report about its economic, environmental, and/or social impacts.

The number of companies filing corporate social responsibility (CSR) reports that use the GRI standards has increased a hundredfold in the past two decades. Over the past 10 to 15 years some forward-thinking real estate executives have genuinely promoted a theory outlining how their businesses could prosper while pursuing a greener and more socially responsible agenda. It turns out that measurement is often nonstandard, incomplete, imprecise, and misleading. And headlines touting new milestones in disclosure and socially responsible investment are often just fanciful "greenwishing." In addition, CSR reporting itself suffers in general from some real problems:[2]

- ***Lack of mandates and auditing:*** *Most companies have complete discretion over what standard-setting body to follow and what information to include in their sustainability reports. In addition, although 90% of the world's largest companies now produce CSR reports, a minority of them are validated by third parties. As a result, a lot of the input data is misleading and incomplete.*
- ***Complexity:*** *Advances in technology (artificial intelligence, satellites, sensors, blockchain, etc.) have given companies new tools for measuring and monitoring their environmental impact. Yet reporting on vital sustainability metrics still has gaping holes.*
- ***Confusing information:*** *Unlike with temperature or calories, consumers have no intuitive reference point that helps them understand many measures of environmental impact. Even metrics that seem easy to grasp may cause confusion.*

1 *European Commission (2021). "Corporate Sustainability Reporting Directive proposal". [Online] EC. Available at: https://ec.europa.eu/commission/presscorner/detail/en/QANDA_21_1806. [Accessed May 18, 2021].*

2 *Kenneth P. Pucker (2021). "Overselling Sustainability Reporting". Harvard Business Review. May-June 2021 issue. Page 134-143.*



A Framework for Transparent Real Estate

A way out

Today there are smarter ways companies can act and report on their investments. To achieve transparency in their real estate portfolio in terms of building a comprehensive reporting framework, real estate businesses must first strategically align processes and data, and be able to set-up relevant key metrics for reporting. Further, they have to be willing to cultivate data and key performance indicators on an historical level, thereby creating a sustainability audit trail that satisfies investor needs for true information. One way to achieve this is for a company to adopt a distributed ledger technology via blockchain that covers the organization and its portfolio.

On the organizational level, real estate companies can adopt a data-driven approach to strategy and build their data streams alongside their investment process. Depending on the scope of the business, data can start with the analysis of macroeconomics for investment decisions. Data then evolves through the whole cycle of managing real estate and investing in the existing portfolio. It is lastly needed to decide on divestments and their execution. Technology solutions automate the data collection by accessing application programming interfaces (APIs) and connecting various databases before preparing the data for measurements, analysis and reporting. One way to stitch together the data is to use machine learning algorithms which make it significantly easier to aggregate and interpret these heterogeneous sources of data. After all, it is not the raw data that creates value but the ability to extract patterns and forecasts and use those predictions[3] to design and update strategies, prepare for uncertainties, and comply with rules. Putting required data on proven distributed ledgers would satisfy regulators' expectations and investors' needs for information. Using DLT can enhance transparency and reduce the costs of reporting.

3 *Asaftei, Gabriel M.; Doshi, Sudeep; Means John; Sanghvi Aditya (2018). "Getting ahead of the market: How big data is transforming real estate". [Online] McKinsey & Company. Available at: https://www.mckinsey.com/industries/real-estate/our-insights/getting-ahead-of-the-market-how-big-data-is-transforming-real-estate. [Accessed May 5, 2021].*

On the portfolio level, creating a "property ID" for each property makes the portfolio digitally accessible. FIBREE has been working on promising projects in this regard. Data can then be gathered and irrevocably stored and made available through a trusted ledger. This ecosystem can benefit an investment organization in ways that might include a trusted mechanism in its sustainability attributes[4].

The Sustainability Case

Sustainability is gaining momentum as a competitive advantage and thus entering corporate strategies. When it comes to real estate, investment markets are increasingly requiring true, understandable and comparable proofs for setting-up sustainable criteria, and meeting sustainability goals. The main idea is to authentically report on how the investment strategy of the company impacts the property life cycle or parts of it during the holding period. It is about identifying which investment decisions lead to which key metrics on the property level. On the organizational level, there are many ways to set an "ESG strategy" involving different combinations of financial and non-financial inputs for each of the Environment, Social, and Governance pillars of sustainable investing. Simply put, data can help most when it shows where the greatest exposure to carbon risk is. One way to efficiently define relevant data would be to create calculable key metrics – if these were based on industry standards, the better. These can, for instance, relate to the carbon footprint of a company, its readiness for climate change, and its corresponding financial risk.

On the property level, looking at the whole life cycle is key. This is where the "Circular Economy"[5] steps in as a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials – and properties – for as long as possible. In this way, the life cycle of products is extended. In terms of real estate, handling properties from "Cradle-to-Cradle"[6] becomes crucial. Ultimately, the whole ecological impact of a property starts gaining as much attention as the implications of periodical management decisions on the property itself.

In understanding real estate this way, properties become a private good of public impact. The bigger the portfolio, the more intense the public interest. A distributed ledger helps record a public history of transactions. The underlying blockchain retains a secure source of proof for all metrics.

Conclusion

Building a distributed ledger technology for a real estate portfolio is no straightforward task. Collecting enough data and choosing the right metrics on the corporate level requires finding a balance between one company's own privacy rules and business sensitivities, and the market's expectations on transparent reporting. On the property level, challenges loom when managing all data assembled during the property's "lifetime." Building a blockchain that can respond to changing database constraints and different frameworks of trust is a stimulating piece of work.

We are at the beginning of a new era in real estate where in the future properties will be judged not only by their brick-and-mortar physical impact but also by their impact on climate and society. Real estate companies that have a proven transparency strategy will master the challenges lying ahead and emerge as winners. ●

4 *Farhat, Roland H. (2020). "Getting Truly Sustainable in Real Estate -- and How Blockchain Can Help. An Approach". [Online] FIBREE. Available at: www.fibree.org. [Accessed May 6, 2021].*

5 *European Parliament (2021). "Circular economy: definition, importance and benefits". Created: 02-12-2015, updated 03-03-2021, Ref.: 20151201STO05603. [Online] EU. Available at: https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits; [Accessed May 2, 2021].*

6 *In their 2002 book "Cradle to Cradle: Remaking the Way We Make Things", architect William McDonough and chemist Michael Braungart presented an integration of design and science that provides enduring benefits for society from safe materials, water and energy in circular economies and eliminates the concept of waste.*

The Centralization of Data in Real Estate and the Role of Authority in Blockchain

Author: Alessandro Dell'Orto, FIBREE Co-Chair - Milano (Italy)

The management of a real estate project generates a huge amount of data. Buildings, neighborhoods and cities are sequential generators of data that must be organized and managed by different operators, both public and private.

Administering and managing spatial and real estate data has always been handled by those who have had the possibility to do so or who could economically exploit these assets. Throughout history, each operator managed their own data according to their own needs and rules. For example, the production accounting of a field, the management of water in the irrigation network, or the payment of taxes on real estate. There were no standards for the creation of such records.

It follows that the creation, maintenance and management of an administrative infrastructure of real estate data depended on its owner or manager, who essentially became the authority for the data, whether public or private.

But what is authority, and who should have it?

The term authority derives from the Latin „auctoritas" and had multiple meanings and nuances among the Romans. Authority meant the power to determine, adjudicate, or otherwise settle issues and disputes or to make and enforce laws. It also indicated the authority on the part of a subject to exert influence and power over another subject.

In the political language of the Republican era of the Roman Empire, the term "auctoritas" was often referred to as the power of the Senate, a power supported by laws. As the centuries have passed, this term has come to mean, rather than the authority and legitimacy of its power, its limitlessness and incontestability as a supreme power.

This conception of authority became a specific and exclusive property of sovereignty, of the absolute authority of the State. And it became increasingly associated with the concept of power itself.

Authority and Power

The concept of authority, based on the relationship with power, embodies two different meanings. The first meaning is linked to the exercise of a power already constituted and, to some extent, "institutionalized." Institutions exercise actual command over other subjects who are bound - by law, tradition, or custom - to obedience. In this sense, we speak of authority exercised by, for example, the manager of a public administration over its employees, or by the state over its citizens.

In the second case, authority is no longer represented by institutionalized and regulated power but rather prestige and authority are accorded them by the parties subjected to them, thanks to their knowledge, qualities and credits.

From Centralized Authority to KOS (Knowledge Organization System)

Focusing on the second case, it emerges that the complex cultural and social concept of authority is central to the assignment of intellectual authority of an entity that is distinct and independent. What constitutes authoritative competence includes skills, decision making, and knowledge.

Public authorities, which we recognize as state or governmental entities, have therefore created the rules, the administrative infrastructures, and the records that we use today to manage and control data about our properties and territories, for a wide variety of needs: from assigning property rights to calculating taxes. Hence, their accepted expertise as authority.

The management and creation of real estate data by public authorities is thus an exercise of their power over a well-defined territory of objects to be administered. The result of this power is that users accept this information without questioning its integrity. Centralized data management may itself be a method of dictating the glacial pace of innovation towards decentralized, more secure and non-manipulable systems.

KOS: The New Nodes in the Network of Public Real Estate Institutions

The innovation that blockchain technology has established within the last 10 years shows us that the model of data creation and its management, in order to create value and trust in its users, must be shared with certain immutable rules that can be verified by the participants in the network. This approach would represent a change in the model of management and government of the public bodies regarding its infrastructures and protocols.

How can blockchain technology change the way the public body is seen as an authority in the real estate world?

Proposing a new model of rules and protocols to create and manage the real estate data would mean that the public authority faces a reduction of its power.

Let's look at the case of real estate registries where the state agency manages this type of information for its direct needs, thereby controlling the access to the data. These registries are managed through a centralized platform where the creator of the data and the creator of the management protocols operate without mediation or control by the user or other entities in the sector.

The public entity as an authority would seem to have no need to move to decentralized systems, both for efficiency and for maintaining the power that has become institutional.

In order to facilitate a transition from a centralized system to a decentralized system with blockchain infrastructure, the different centralized entities must transition to a knowledge system where the territorial authorities recognize themselves as knowledge centers, and not authority centers.

Continuing with the analysis, we realize that the management of land and real estate data are linked to the place and territory where the public entity exercises its authority. This is a limitation that digital systems can overcome by communicating data and transporting value across local and national boundaries with blockchain technology.

Being able to create the necessary rules and protocols that are recognized by all entities exercising their authority and competence at a local or national level could conceivably create a global codification of information. However, one cannot expect to develop this process using technology implementation alone. Almost all actors, many being public authorities, should apply this principle of global codification to the legal and economic aspects on which they normally work.

Conclusion

The awareness on the part of public authorities of the need for unambiguous data collection assumes that they lose or reduce their power of command by becoming centers of knowledge rather than authority.

This new knowledge-based authority presupposes new models with the objective to encourage professionalism and the search for ever better management systems.

In this sense, the FIBREE network can contribute to the exchange and study of the different needs regarding application systems by acting as a node of knowledge authority. FIBREE's aim would be to facilitate and guide the creation of common rules to local and national real estate data registries. This may jumpstart the establishment of a blockchain that meets the needs of international development within the real estate sector. ●

Postponed Blockchain Transformation of Land and Property Markets. The Case of Sweden.

Author: Anetta Proskurovska - PhD Researcher, LISER - (Luxembourg)

Real Estate and Blockchain: the Slow Revolution.

There are few remaining doubts that blockchain has the capability of reorganising the way cities are built, real estate assets are formed, owned, traded, and financed. These expectations are based on the promise that blockchain can make knowledge exchange faster, cheaper, and more transparent. As a growing number of public and private organizations attempt to capitalize on these opportunities, adoption at scale is still far from being realized. Both enthusiasts and critics of using blockchain in real estate transactions often point to the same obstacles that make the technology adoption difficult. These commonly include technical, legal and governance issues. What is less often discussed, is resistance to change. Indeed, while everyone is aware that it is the very nature of blockchain to transform organisational structures, and disrupt value chains built on inefficiencies and information asymmetries, this challenge remains the elephant in the room. It is naïve to believe that attempts to alter legacy routines and infrastructures underlying centuries old land and property markets would be passively accepted by all sides. Resistance, however, does not necessarily imply an open rebellion. A mere support of more conventional solutions to problems that blockchain would have otherwise eliminated, might be enough to reduce the need for radical innovations. The case of Sweden provides a vivid illustration of such a scenario.

The Swedish Case.

In 2016, Sweden was the world's first country where a public-private consortium began to investigate the use of blockchain and its smart contracts for residential real estate transactions, including mortgaging. Unlike many other countries, Sweden already had a reliable centralised real estate ownership registry. Its digitised record is accessible to the public, and the content is guaranteed by the state. On top of this, there is no legal requirement to engage third trusted parties such as brokers or notaries in the housing transaction. At the same time, sales contracts are still in paper form and must be hand-signed. Moreover, while the Swedish land registration authority needs only a few days to register the new owner, it usually only receives the request and the sales contract about four months after the parties have signed a legally binding agreement. In addition, the sales of homes owned indirectly, such as cooperative apartments, are not registered with the land registry at all. The consortium efforts went so far as to actually develop a working application addressing these inefficiencies and associated risks.

In a nutshell, the application eliminated the use of paper, offering a unique digital space where transacting participants could exchange information, sign legally binding agreements, and broadcast their results to other authorised parties (Kairos Future, 2017). Their direct interactions were governed by a standardised and pre-programmed workflow where the execution of some transactional steps triggered automatic execution of others. Thus, for example, as soon as the buyer

and the seller digitally signed the sales agreement, a [pending] registration of the ownership title would be issued. As a result, knowledge about the ongoing transaction would become public immediately, and not four months later. On top of this, the reduction in the number of steps would completely change the way transactions are structured and governed.

These seemingly minor changes would disrupt a number of value chains that hinge on existing transactional routines. For example, currently brokers are almost always solicited to mediate the sales of homes. One reason for this is that the majority of homeowners in Sweden take out mortgages, which means that housing transactions are long and complex. Brokers provide guidance to both the seller and the buyer, taking over drafting contracts, and communicating with the banks, as well as some other tasks. Their presence in the majority of the Swedish housing sales turns them into a key element within the supply chain of transactional data contained in the paper sales contracts such as purchase prices. Indeed, as soon as a broker marks in her dedicated management system that the legally binding agreement was signed, the associated contractual data become available to the Broker's Statistics. Broker's Statistics is the organisation that collects this data daily, to both produce statistics reports, and to supply it to other organisations. The latter, re-use it creating a range of sophisticated products vital for the assessment of properties' market value and for understanding the Swedish housing market's dynamics. Mortgage finance and the whole Swedish real estate sector are heavily dependent on the frequent update of this knowledge (Bjellerup and Majtorp, 2019). Should the blockchain application eliminate the use of paper contracts and handle all contractual agreements in the blockchain application digital space, many value chains would inevitably be affected.

Luckily for brokers and other organisations whose market share could be potentially reduced, in 2018, only a few months before the blockchain application was tested live, a private consortium of incumbents had launched a new platform called Tambur. Tambur was designed to facilitate and standardise the interaction between brokers and banks during home sales and has become an immediate success. Without using any radical technologies, it managed to make the workflow more efficient, while preserving the status quo. Since only brokers can interact with banks in this exclusive digital space, the platform firmly solidified their role in property transfers, along with other value chains based on brokers' involvement into contracting.

In the meantime, the blockchain application remains a prototype. The critical piece of legislation needed to make digitally signed real estate sales contracts comparable to those hand-signed, is still missing.

Conclusion

Blockchain applications can connect parties transcending conventional boundaries of sectors and domains. What is more, they can reduce the costs of creation, maintenance and exchange of exclusive rights to land and the built environment. However, the adoption of technology for real estate transactions also creates controversies. On the one hand, standardizing and simplifying transfers of ownership, mortgaging, registration, etc., would make the real estate market more transparent and efficient. On the other hand, many inefficient practices would be eliminated, along with associated value chains. Crucially, land and property ownership also form the asset base for individuals, cities and, increasingly, entire jurisdictions. What are the chances that risk-averse policy makers or incumbents that risk losing market share will easily accept the transformation of centuries old systems and customs serving as the base for existing markets?

Social systems are inert and there is nothing new in resistance to radical innovations. Many hope that as soon as the critical mass of market supporting institutions and policy makers will realise that the benefits are greater than the losses, nothing will stop the widespread adoption of blockchain. While this might be true, the moment may only come once incumbents are fully adapted and ready to lead the change, not to follow it. If blockchain enthusiasts hope to manage this risk effectively, and speed up the adoption of blockchain for such a conservative sector as real estate, they need to go beyond conventional business ecosystem analysis acquiring a more profound understanding of geographically embedded socio-economic systems, their complex arrangements and power-balances across the networks of incumbents hidden in plain sight. ●

Note: The Swedish case was investigated in the framework of ABTLAS project founded by the FNR. https://www.fnr.lu/projects/applications-of-blockchain-technology-in-land-administration-systems/

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Tax Benefits in Real Estate, Credit Management With Blockchain Ledger

Author: Federico Garaventa, FIBREE Co-Chair - Genova (Italy)

Money can exist in various forms. Modern coinage dates to 500 BCE, with paper money making an appearance in 806 CE but legionaries of Roman empire were paid in salt, from which the term "salary" originated.

Since its inception, Bitcoin, that digital currency in which a record of transactions and new units are generated by the computational solution of mathematical problems, has brought new life to the debate about the very definition of money.

Ultimately, valid answers are the ones provided by the market, rather than those from doctrine. If we assume that "the market" exists as a result of the total sum of its individual players, the good news is, if you are reading this article, you are one of those individuals. So, about yourself, if you received a cryptocurrency payment that could be used to pay taxes, would you accept it? The answer would probably be yes, depending on the amount of taxes you'll have to pay in the near future and what limits might be placed on the payment. Even with no limits, the expectation that you'd be able to pay other private debts with it, might sway you. The answer to this question may be revealed sooner than expected.

The Italian government, in recent years, has implemented a specific model of public spending. To compensate for a chronic lack of cash, incentives are now, in most cases, provided by tax credit subsidization. This is a smart financial "trick" where individuals are essentially given their own money back, and the government looks great in the meanwhile. This trick, however, is becoming a systemic component of the national economy.

For those unfamiliar with the tax credit system, here is how it works: A tax credit is an amount of money that taxpayers can subtract directly from taxes owed to their government. Unlike deductions which reduce the amount of taxable income, tax credits reduce the actual amount of tax owed. Tax credits are more favorable than tax deductions because they actually reduce the tax due, not just the amount of taxable income. There are three basic types of tax credits: nonrefundable, refundable, and partially refundable. A nonrefundable tax credit can reduce the tax you owe to zero, but it can't provide you with a cash tax refund, this being the case here.

The trick is working quite well for many industries. One of the sectors benefiting most from the increase in funding is the sector for climate transition and, specifically, the industry of energy efficiency in construction and real estate. Unfortunately, the Italian national market is defined by extremely fractional ownership (more than 70% of Italian families live in their own homes, mainly in condominiums) and the existing real estate stock is old, if not flat out "historical." Moreover, the renewal ratio is negligible.

All this leads to a subsidizing action forcibly addressing families and their old properties, rather than industry players and new buildings. Drawbacks are quite clear: when individuals renovate while living in their house, there are stricter limits to the extent of works to be performed without affecting their lives. Typically, there is less funding available for families than the amount of funding available to professional players. In addition, the perimeter is often limited to a single apartment in a condominium, which has no real impact on building envelope and main installations. To overcome these challenges, the Italian government has put forth a large amount of money to "break the ice" and actually start a movement towards energy efficiency. Individual incentives to renovate for energy efficiency for the years 2020/2022 rose as much as 110% (10% VAT included) of the amount invested, as well as money to invest in anti-seismic structural securing (SuperECObonus, SuperSISMAbonus). Not surprisingly, a 110% subsidy created a splash, as expected, despite a very complex compliance procedure. However, many operational restraints still lie along the path. First, the tax capacity of the single family may not be roomy enough, compared to the renovation costs. Moreover, the taxpayer must have the financial means to carry the full renovation amount until fully refunded, which will take five years with installments. Both points proved problematic and, to some effect, limited the spread of these incentives. Relying on the loan market could offer a way out, but families aren't always in a position (or willing) to borrow. Moreover, access to the loan market, for families, goes through banks, adding a layer of complexity.

An important innovation, which the government has just introduced to help the spread of these incentives, is to allow

the circulation of tax credit among taxpayers. This has certainly made this tool more liquid, a mere inch from being cash, but the fact remains that whoever originates it and becomes the first holder of the credit to carry out the renovation , must still fund the full amount. By law, the tax credit generated by the invoices of the renovations carried out by the contractor do not become available, negotiable and transferable until February of the following fiscal year of invoice date. So funding can't be overlooked.

But what if some crypto industry player could design and launch a blockchain-based solution to overcome this last and most important hurdle? The good news is that an available solution already exists. It is based on a specific and updated implementation of the well-known Colored Coin technology. Contractors can load SuperECObonus-worthy invoices on the platform and, once deemed compliant, the same amount of grey tokens is generated. On the flip side of the platform, prospective tax credit buyers can immediately purchase and pay the grey tokens, hence funding works. Following the procedural compliance with the law, grey coins become colored, all while securing final value along the way, since the whole process happens through a dedicated platform.

My guess is that the same solution could be based on different technology also, an Ethereum token for example. It's worth noting that most (if not all) of the platform customers don't even know a thing about blockchain or cryptocurrency. But the beauty of it all is that they won't ever need to (which should be food for thought). When viewing this project from a FIBREE point of view, I consider this solution to be most relevant, as it's the first business tool available in Italy that is:

- *business-ready, operative and available to any taxpayer or contractor*
- *does not require any blockchain knowledge or technological involvement by users, nor expertise to acquire (it's as simple as using a smartphone without knowing a thing about radio wave theory)*
- *performs a task which would have been impossible without blockchain technologies*

Both the homeowner and contractor can receive funding without applying to a bank for debt or any kind of loan, all for the best operational, balance, and rating benefits. Another aspect worth noting is that this is an example of "good" blockchain, where the new technology does not lend itself to disruptive goals, as often indicated and feared by the establishment. In fact, it is quite the opposite as here, the blockchain helps the government reach its goals, in a way otherwise unfeasible.

The blockchain world is often split into two halves: the first are permissionless and fully decentralized ones, seen as the epitome of freedom by some. But perceived as the Dark Side of the Force by authorities and Governments. The other half are permissioned blockchains. This more regulated use of blockchain is more palatable to governments but is deemed useless by many. The interesting thing is that the blockchain solution in Italy is based on the Bitcoin Blockchain (the even darker side?) and yet, as a result, quite the opposite from being disruptive, it actually helps the Government to reach its goals. Maybe the market has found a way around the prejudice of decentralized finance? Or are we taking the first steps towards the unknown?

Let's go back to the beginning of the article and ask why we were talking about the definition of money, in the first place. In order to propel the use of these tax credit incentives, most recent laws have allowed for wide circulation of such SuperECObonus tax credits. They permit this without any limit on the number of transactions and type of economic subjects. We are talking about national taxpayers here. Basically, a currency parallel to BCE Euros is, de facto, configured. But transit through the recipient's online "Fiscal Drawer" makes for complicated transfers, so it is not much useful as a means of payment.

What if now these credits, fully tokenized, are able to circulate outside the native platform? In considering the type of token--a Satoshi or an ETH token--these tokens can be transferred in a blink of an eye between parties who are able to use a crypto wallet or an exchange server. Fractionalization won't be a problem since these tokens represent simply euros and cents that can be used to pay taxes with. It would not just configure some sort of alternative currency, but an actual stablecoin with an effective "1 to 1 euro" value for any perspective taxpayer. The tokens could circulate peer-to-peer in the most effective way and outside bank circuits. From a monetary point of view, an intriguing question is whether or not these tokens would contribute to increasing the money supply (M1) in Italy. It also raises the question as to what will happen considering the effect within the whole Eurozone. Given that Italy has no national currency, despite this tool being intended for the Italian taxpayers, could it create a ripple effect on the Euro monetary base, on money supply?

So, at the end of the day, will we be paying pizzas for family dinner with our future tokenized taxes, anytime soon? ●

The Power of Ownership.

Unique Network NFT Parachain on Polkadot Case Study.
Author: Irina Karagyaur, FIBREE Co-Chair - London (UK)

Since the dawn of humanity, different approaches have been created to manage and regulate ownership of items and assets and the transfer of them. For the always pragmatic Romans, the dominium was a key feature while the formal transfer of property, mancipatio, demanded a solemn verbal contract by means of a ritual where the ownership of certain types of goods was transferred in the presence of the parties to the sale, five witnesses (adult male Roman citizens, as trusted mediators), a pair of scales, a man to hold them, and an ingot of copper or bronze.[1]

The seller grasped the object being transferred (the thing) and declared: "I assert that this thing is mine by Quiritarian [Roman] law; and let it have been bought by me with this piece of copper and these copper scales." He then struck the scales with the ingot, which he handed to the buyer "by way of price." [2]

Although the key elements of a contract remain today (the thing, the parties, the payment and mutual consensus on the acceptance of an offer that leads to a legally binding offer), with Justinan, the Byzantine emperor from 527 to 565, the Roman code and regulations changed and made the mancipatio invalid.

Ownership as an essential feature of our socioeconomic relationships has always been identified as a top priority by our legal systems and philosophers. Philosopher Adam Smith, who is known as the father of liberalism, established that safeguarding private property was the "sacred" mission of law and justice, while for Rousseau, ownership was shaped by our social agreements that would establish which objects could be possessed and by what terms.

In Modern history, ownership and its transfer have been adapted by different nation states –Liberal, Socialist, Welfare–to fulfil their ideologies and political agendas by means of the power of law. Consequently, the concept of ownership sustains the basis of our interconnected world economies and it will continue to be pivotal in the foreseeable future. Ownership of real estate is commonly described as a "bundle of rights of property" [3] where the holder is entitled to:

- *The right of possession;*
- *The right of control;*
- *The right of exclusion;*
- *The right to derive income; and*
- *The right of disposition.*

Due to the entitlement of ownership, a property owner will need to fulfil his obligations, but he will be allowed to exercise his given rights, or choose to exercise none of them. The proprietor will also be allowed to exercise his obligations separately over time. In these situations, the legal framework establishes dedicated contracts where owners can dispose of different rights without worrying about losing their property. Selling a property means transferring ownership as a whole to its new proprietor; renting a property will only transfer the possession for an established time frame. A usufruct contract will confer a temporary right to use and derive benefits from a property. And in all cases, failing to meet obligations will return the given rights of a property to its owner.

1 *Jolowicz, Herbert F., R. Powell, et al., "Roman Law: The Law of Property and Possession," Encyclopedia Britannica.*

2 *Ibid.*

3 *Kimmons James, "What is the Bundle of Legal Rights of a Property Owner?" September 10, 2020, The Balance Small Business.)*

The new Paradigm

In our current framework, many legal relationships are governed by central entities and frequently require trusted mediators. For instance, real estate property needs to be noted in the register, and in the case of a rental agreement, the private contract between the landlord and the tenant will sometimes demand the intervention of lawyers and real estate agencies as trusted mediators. From a process point of view, these go-betweens will tax transactions in terms of time and money. However, to tackle these problems, a new wave of innovation has been created by the property technology movement, known as PropTech.

Among the new technological advances, two innovations stand out: blockchain because of its intermediation automatization (and sometimes eradication of overly-long bank transactions due to peer-to-peer transactions where allowed); and smart contracts that automate and speed up the legal processes. One of the most promoted advantages of blockchain in the real estate space is the promise of liquidity via decentralized global markets that enable assets to be tradable. In terms of smart contracts, the dedicated contracts that enforce the bundle of rights of property, can be programmed to trigger actions and execute orders as required. A main consequence is that any kind of property assets such as buildings, shares or funds, debt or equity, can be automated in ways previously unseen before and executed in minutes instead of weeks or months.

When Ethereum was created in 2015, as a platform that would go beyond Bitcoin's capability of "simply" creating and transferring cryptocurrency, smart contracts gained traction in functionality and innovation. The ERC-20 tokens, which have set the standard for tokenization, are good for executing transfers because some rights of ownership can be written into the smart contracts. However, since the ERC-20 tokens are all the same (fungible), they have limitations when the purpose of a smart contract is to represent a unique object as an art piece or a real estate asset. For these non-fungible cases, the proven value of the ERC-721 standard and the more advanced ERC-1155 have solved the uniqueness issue. More to the point, the ERC-809 and ERC-1201 standards allow renting of NFTs as a small subset of such authorizations. [4]

The capacity to store different metadata and make different standards work together seamlessly allows for new opportunities to manage ownership rights. To achieve this, different Ethereum standards operate together, as do whole blockchains, tokens and protocols. Thrustless transfers from different blockchain networks or "interoperability" will certainly accelerate mass adoption.

An interesting case study is Unique Network blockchain in the Polkadot ecosystem. This is the standard for good practices serving software that uses or relates to NFTs.

On its "Advanced Ownership Structure,"[5] owning an NFT in the 3d generation blockchain paradigm will be much more than just seeing an image associated with it. The aim is that NFTs will become usable and transferable in the metaverse as well as applicable and usable to documents backing up real world data (such as certificates of ownership). Some of the possible activities applicable to NFTs include:

- *Lending and Borrowing; implies the capability to temporarily transfer some property ownership rights to another address*
- *Right to display given to a third party grants the permission to (exclusively or not) use the property for display purposes.*
- *Deed of trust or right to sell or act in some other ways on behalf of the owner is often used in the real estate, personal or business situations*
- *Re-fungible mode on Unique Network enables a DAO ownership in one click. Or take a valuable piece of art and democratize its ownership. Add smart contract functionality to play with what owners can do with the pieces.*[6]

As technology propels us forward, the challenges of managing and regulating ownership of "things" and their many uses, will help us innovate as more unique use cases rise to the fore. ●

4 *"Unique Network Technical Paper," Unique Network, github.com.*

5 *"Unique Network Technical Paper," Unique Network, github.com.*

6 *"Unique Network Technical Paper," Unique Network, github.com.*

Real Estate Tokenization as a Bridge to DeFi

Author: Yael Tamar, FIBREE Co-Chair - Tel Aviv (Israel)

The desire for a decentralized financial system sometimes begins very close to home. For me, the memories of living in Crimea under the Soviet Union's centralized government was a strong catalyst that propelled me first to the United States and then to Israel, where I experienced very different types of financial systems.

In traditional centralized finance (CeFi), the banks govern and control people's assets. The hub and spoke model of CeFi means that financial capitals such as London or New York function as operational hubs for the financial services industry and influence economic activity at spokes such as Mumbai or Tel Aviv, regional centers that may not be as globally dominant. Economic prosperity or hardship radiate outward from hubs to spokes and toward the rest of the global economy. In a recession or financial crisis, what happens in the central centers of this hub-and-spoke model, reveals the flaws in the system as these hardships are felt globally.

In stark contrast to this, a decentralized financial (DeFi) system allows the individual to be the sole custodian of his or her finances and bypasses the need for large financial institutions. Granted, DeFi also requires a stable monetary system. Some of the same checks and balances that are integral to CeFi must also be maintained before transacting business, including know your customer (KYC) and anti-money laundering rules (AML).

DeFi might be considered as the merger between traditional banking services with the integration of blockchain technology. In this model, a company like SolidBlock creates securities that allow non-traditional investors access to otherwise exclusive investments. There is also full transparency of issuance, repayments, and dividends within these transactions as all the information is coded into the digitized smart contracts that are used to record transactions.

How do we get to DeFi?

The early 2000s introduced a shared economic model led by the advent of Facebook, the founding of companies like Uber, and the creation of cryptocurrencies. Yet even the instantaneous PayPal model of peer-to-peer money transfers transmits money between two or more banks before it reaches its destination.

DeFi, in contrast, uses technology to disrupt centralized models and enable the delivery of financial services anywhere for anyone regardless of ethnicity, age, or cultural identity. It creates new opportunities and helps those who don't have access to loans, credits, credit history, education, or even a full-time address. DeFi is therefore more democratic, allowing individuals to create wealth and obtain financial freedom on their own terms.

What is the Tokenization of an Asset?

This past year, the COVID-19 pandemic changed so much about how we work, where we work, how we meet, and how we finance deals. For example, there has been a thirty-fold increase in the amount of trading using blockchain technology.

Within the real estate market, there is a $317 Trillion dollar industry but only $10 Trillion dollars is genuinely available for investment. Most of the other $300 trillion is held privately or via public securities. It is tied up in loans and deals sometimes for up to ten years without the individual investors being able to trade or liquidate their investment. Other people, other institutions make those decisions.

In the traditional asset world, demand for liquidity is high. To unlock the liquidity of those projects, assets can be tokenized. The tokenization process helps asset or fund owners raise capital more efficiently, and gives investors unprecedented access to private real estate investments, transparency, and liquidity.

What is the process by which an asset becomes available for trading? When an asset owner decides to tokenize a property, a security token (ERC-20 or alternative) is created to represent shares of the property. The total value of all tokens will be equivalent to the total value of the securitized asset, as valued at issuance. The initial sale of a security token is typically called a Security Token Offering (STO). An STO needs to be compliant with the appropriate country regulations.

In the US, most STOs to date have been completed under the exemption rule for fundraising without a full prospectus (Reg D 506C). Some have used crowdfunding regulations. Tokens can also be potentially sold on an exchange, but in a compliant way.

The first step in the tokenization process is to set up an entity and create initial legal and offering materials. This streamlined regulatory and securitization process, must include KYC and AML. Next, asset ownership is represented by digital shares in the form of tokens on the blockchain. The benefit from token liquidity is listing the tokens on investor trading platforms. Once tokens are created and sold to investors, they may be listed on an exchange so investors can trade their tokens.

Many of the most popular cryptocurrency exchanges are in the process of obtaining regulatory approval to list security tokens.

Another option is to partner with an Alternative Trading System (ATS). These are FINRA-registered institutions that sometimes partner with tokenized security asset owners to list security tokens and provide their investors with access to a liquid secondary market. A single token can be listed on multiple exchanges.

The digital securities market is relatively small. However, when real estate assets are tokenized, we enhance accessibility, lower transaction costs, create new financial products, make settlements faster, and enhance liquidity.

The Example of GameStop and Robinhood

An example of how the current central financial system favors big business can be seen in the "uprising" recently witnessed on Wall Street by amateur investors who caused big institutions to lose a lot of money.

GameStop is the world's largest retail gaming company. But because many video games have been digitized and the pandemic kept people at home, their physical shops, the basis of their business, weren't doing well. A year ago, GameStop's shares reached a low of $3 dollars. At this point, trying to make money, some Wall Street hedge funds "shorted" the GameStop stock. That means that they bet on it dropping even more. They sold it low and hoped it would drop lower so that they could then buy it back at a profit.

There is a risk involved in shorting a stock because it is entirely possible that between selling and buying, the stock becomes more valuable. This is what happened when a group of game lovers banded together on their Reddit community platform to prop up the GameStop stock, buying it while it was low and raising its value. That meant that the hedge funds who had sold low lost money on their bet that the stocks would plummet.

The Reddit community users were using a platform called Robinhood to buy GameStop shares. Robinhood allows users to trade stocks commission-free. Suddenly, Robinhood banned users from buying GameStop shares, and caused outrage among the amateur investors that Robinhood was trying to protect the hedge funds. In reality, Robinhood was bound by "real-time settlement" liquidity issues and had to borrow money to cover the large amount of trading on their platform.

What is clear from this example is that the average individual is primed to take control of his or her own finances. They don't need Wall Street investment companies to trade for them as alternative platforms are available. It also shows that though technology exists to streamline the buying and selling of stocks, unfettered money exchanges have not yet been incorporated into the way we do business.

On the Cusp of a DeFi System

Perhaps the most prevalent sign that we are headed towards a decentralized financial system is the institutional adoption of blockchain technology among large corporations. MasterCard, Tesla, PayPal, and JP Morgan are just some big companies that have taken tokenization into the mainstream. This turn-around is based on a combination of huge consumer popularity and the fear of missing out.

In addition, the reputational risk of working on the blockchain has been significantly reduced over time. Applying blockchain to their investments gives these institutions a tool to invest in assets early, to support these assets and shepherd them to secondary markets where they will be more democratically available.

As a society we are positioned on the edge of a revolution that is leading towards a decentralized financial system. We can close our eyes and hold tight to the traditional way things are done. Or we can step forward open-eyed and excited by the rapid advancements that are taking place within the financial system.

Crowdfunding and Tokenization: Alternatives or Better Together?

Author: Yael Tamar, FIBREE Co-Chair - Tel Aviv (Israel)

With the accumulation of major capital among players in the cryptocurrency markets, real estate has become a desirable asset as a way for individuals to diversify their wealth and the obvious choice for investing their profits. What is new in this scenario is that there are more and more options for these purchases to occur using cryptocurrencies. In the news most recently was the option through SolidBlock's issuance and trading platform to purchase condos with crypto in a luxury Miami high-rise. This heralds a slow change in traditional real estate transactions and suggests that real estate corporations are betting on the advantages of blockchain while taking on the risks of this more volatile currency.

The focus of this article is not on the buying of extensive property by one investor with cryptocurrency (though there are rumors that in a 2018 offering of apartments in Dubai, one investor used crypto to purchase 10 apartments) but in the tokenization of high-end real estate assets that are accessible to a broader and perhaps less wealthy group of investors. To better understand the tokenization process, it is important to ask first about how a security token offering (STO) is created, how buyers are vetted, and what we can learn from examining case studies about the future of tokenized transactions.

Creating an STO

Each offering needs to be compliant appropriate according to the regulations (adhere to the laws governing who can invest in securities and which rules security issuers must follow to sell the security). The platform must also facilitate regulatory compliance by creating the necessary legal documents and providing know your customer (KYC) and anti-money laundering (AML) procedures for investor vetting.

The property is placed on a digital marketplace where information about this and other specific projects can be accessed by investors globally.

Each investor's purchase is recorded on the blockchain ledger. For this to occur, the digital marketplace creates a special contract, called a "smart contract," which provides a secure record for each investor and allows for trading of this security.

Digital security tokens can be sold on a specialized exchange or ATS, Alternative Trading System. The process of listing the security on an exchange is called a secondary offering.

Identifying a Buyer

Once a buyer is identified, there are several basic steps that must be observed to sell real estate digitally.

A Purchase Agreement must be signed with a buyer, together with an amendment to address the coin deal with its required compliance, fees, time frame, replacement of escrow process, and state of residency. At this stage it is also important to know if the client is an individual or part of a trust.

All deals are subject to the buyer's successful compliance with KYC and AML requirements both for the individual and for his or her crypto wallet.

Once the buyer submits full payment in coin, funds are converted into USD and the account for withdrawals is frozen. The closing agent prepares a statement for the Department of Housing and Urban Development (HUD) which then transfers the title once all documents are received and the seller confirms the balance on the account. At that point, the seller releases the funds to a bank account.

Two Case Studies

Case Study: Asia's First Real Estate Tokenization for Employee Incentive Program[1]

In Q4 of 2019, Liquefy, a Hong Kong-based FinTech platform, successfully completed the first phase of a project with a Hong Kong property developer to tokenize a real estate asset owned by the developer for its employee incentive program. The initiative was designed to motivate staff engagement in innovation, cultivate entrepreneurship, and recognize staff contribution. Through the program, tokens representing an ownership interest in the property are issued to reward high-performing staff with the opportunity to share in the wealth created by the capital appreciation of the property.

As the technology provider, Liquefy secured the digital register of members of the holding company, which owns the property, on blockchain. This enabled the developer to issue tokens representing an indirect ownership interest in the underlying property carrying a right to share in any capital appreciation of the property. Employees can exchange performance-based internal credits for real estate tokens, with every transaction in real estate tokens recorded on the system. When the underlying property is sold, token holders will participate in the sale proceeds based on the tokens held.

Looking towards the future, the next step would be to tokenize more properties held by the developer to expand the incentive program such that employees could internally trade tokens for different properties among themselves.

Case Study: The St. Regis Aspen Resort, Aspen, CO

Valued at $224 million, the St. Regis Aspen is a trophy property and a luxury destination located in Aspen, Colorado. An equity raise of 19% of the property in August 2018 raised $18 Million within the first four months of being listed. This was executed in conjunction with a regulated Security Token using Reg D 506 (c) of the JOBS Act.

The tokenization of the St. Regis is one of the first cases of tokenizing a commercial real estate property worldwide and it was an unabashed success. Within 18 months of issuance, AspenCoins had risen in value by 28%. In September 2020, AspenCoin was listed on tZero, a secondary market where trading increased markedly. The initial 22 investors in the equity raise have grown exponentially to more than 900 today as AspenCoin is bought and sold at will. More than 5% to 10% of the token volume is traded on a monthly basis. The current price of a token is $1.25, up from its issuance price of $1.

Having met, and perhaps exceeded, its fundraising goals, the St. Regis Resort conducted an extensive renovation of its property, with a campaign to bring in new and diverse customers. Meanwhile, the future of AspenCoin is ensured through its vibrant secondary market trading on the tZero exchange.

Conclusions

While it remains to be seen whether a buyer will come forward to purchase the Villa Nove penthouse in the luxury Miami Arte Surfside building with cryptocurrency, it is clear from the case studies above that the tokenization of real estate can have a profound effect on smaller investors such as the employees of the Hong Kong developer who were gifted property tokens, and the 900 plus investors who are now trading AspenCoin on the tZero secondary market. This is the promise of democratization embedded in blockchain technology, a decentralized financial system where individuals are the sole custodians of their assets. Blockchain can help create a compliant, decentralized and permissionless marketplace. Tokenized real estate is the bridge to this vision.

What is needed now is a further acceptance among real estate owners, sponsors and investors that this is the wave of the future, and that accepting both the profits and risks of tokenization is beneficial to their businesses.

The Villa Nova's price tag? $38 Million. ●

1 *https://assets.kpmg/content/dam/kpmg/cn/pdf/en/2020/04/real-estate-tokenization.pdf*

NFTs & Real Estate

Author: Alexander Appelmans, FIBREE Co-Chair - Brussels (Belgium)

Although widely discussed, tokenization still remains a rather vague term which takes on different meanings depending on its specific context. When used in the context of real estate, tokenization refers, broadly speaking, to either representing units or shares in an immovable asset or using a unique non-fungible, blockchain-based, token to represent a (single) property. While the first use case focuses on liquidity and fractional investments, the second aims to make it easier to transfer ownership of an immovable asset.

Colored coins are a well-known example of a non-fungible crypto asset on the Bitcoin blockchain. More recently the term NFTs or Non-Fungible Tokens became the popular denomination. The CryptoKitties and Beeple's $6.6 million video captured the imagination of the wider public. The Ethereum blockchain was used in both these high-profile use cases. Consequently, NFTs soon became the talk of the town. The key idea underlying an NFT is to give full legal ownership of a unique digital file.

These approaches to real estate tokenization can be referred to more generally as the digitalization of corporeal assets. In the context of a conveyance process, a real estate asset represented by a digital token and governed by the transactional rules of e.g., a blockchain-based smart contract, could considerably reduce the many frictions associated with transaction between parties. In the context of NFTs, we focus primarily on the digital representation of property rights becoming the "object" of a transaction themselves.

If a real estate asset is tokenized, what does that mean precisely? Again, we have to distinguish between tokenization as a form of alternative financing and tokenization as creating a non-fungible digital twin of a real-world asset. Of course, a combination of both is technically possible.

When studying tokenization as an investment tool, a case-by-case consideration is required. Is it a form of co-ownership? Is it a binding contract? Various legal issues arise. For example, the economic vs. legal owner debate (some scholars see tokenization as a trust-like figure) and a further avenue for the dematerialization of property law.

In the crypto-world, it is often said that the lack of a regulatory framework offers a first-mover advantage. In contrast, legal scholars are increasingly turning their attention to token sales and cryptocurrencies and make it clear that ITOs, ICOs or other derivatives do not operate in a legal vacuum. Today, it is not clear what form regulation will take as several issues still need to be fleshed out, including how tokenization will interact with other more established securities and land law principles.[1] There is an abundance of financial regulation, tax compliance and company legislation that has to be respected. Different financial watchdogs have issued statements on ICOs and token sales. Mainly from the perspective of consumer protection, it is necessary to develop a framework that would limit legal uncertainty.

When we consider NFTs, on the other hand, we can see a myriad of usages in the context of real estate. An absence of formal property rights limits the use of land as collateral to access credit markets. A solid property law system allows bulky assets to be available in a more accessible format. Instead of the actual physical asset, a representation is much easier to divide, mobilize or use as collateral to close business deals. This is what Hernando de Soto labels in his famous book, *The Mystery of Capital*[2] as "*making assets fungible.*" The key mechanic, according to de Soto, is to decouple the rigid, bulky physical state of an asset from its economic features and value. This is generally done by creating a representation of the asset. Creating a fungible representation allows for the asset to easily become an object of a transaction.

In this regard, tokenization, and more precisely, NFTs are nothing new. They are merely a digital form of a mechanism that has existed for many centuries, i.e. creating a fungible proof of ownership of a corresponding asset, which can be used to make secondary markets more efficient and straightforward. This "investment" form of tokenization is a further digital and decentralized elaboration on secondary markets.

Whether the asset is made fungible via a notarial deed, an excerpt from the land registry or a "non-fungible" token, the underlying mechanism remains the same. Tokenization is mainly the process of digitalizing an existing process.

In that last sense, the terminology of an NFT is perhaps a bit contradictory. While it is used to contrast fungible tokens or coins, the underlying mechanism it is trying to achieve in the real estate context is precisely that of making the underlying asset fungible. As such, an NFT does actually make a real estate asset fungible. ●

1 *Jane Dockeray and Jessica Thompson, 'A Token Gesture with Real Effect' [2019] Property Journal; London 35.*

2 *Soto, Hernando de, The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else, Perseus Book Group, 2000.*

BUPi, UOI and EBSI: a Match Waiting to Happen

Author: Jose Reis Santos, FIBREE Co-Chair - Lisbon (Portugal)

BUPi is an initiative from the Portuguese government, whose acronym (Balcão Único do Prédio – Building Unique Counter) could almost be translated as a Unique Object Identifier (UOI). This government sponsored project intends to digitize and aggregate what today are dispersed sets of data into a one-stop, single and organized data source. At the moment BUPi is concentrated on rural and mixed properties, an area where the lack of organized information is flagrant and economically damaging and the benefits of its aggregation are evident. Once these goals are achieved, BUPi aims to expand and extend the Building Unique Counter and respective Simplified Cadastral Information System to the whole country. This would develop supporting information and interoperability systems to simplify the identification of owners and property limits. It would also increase the knowledge and shared information about the occupation of the national territory.

BUPi's mission expands a simplified cadastral information system that would aggregate local information and create a relevant knowledge-based dataset about the Portuguese territory. Its vision is to experiment with innovative methods and transform knowledge into value for the country. Municipalities would have access to all the existing information from other municipalities through the adoption of new technological solutions.

There are four main axes in BUPi's mission: people, entities, technology and simplification of data access. The first, related to people, aims to identify and empower property owners, and comprehensively involve them in sharing knowledge and opportunities that would bring added value to the Portuguese territory. Complementarily, BUPi intends to create synergies so that entities and stakeholders share in a collaborative and consistent manner the information necessary for the effective management of the territory. This would facilitate the creation of new solutions while continuously developing and iterating a unique, participatory and interoperable platform, which allows automating the collection, processing and sharing of data in order to generate knowledge, i.e., technology. Finally, the fourth axis, simplification, aspires to bring digitalization and innovation to procedures related to rustic and hybrid property ownership registration and respective regulatory frameworks. The BUPI project, based on its declared objectives and goals, could be a perfect match to introduce a pilot project that would encompass the concept of UOI and an integration into the current version of the EBSI.

From their declared intentions, BUPi does not contemplate any future blockchain integration, a decision that should be considered prudent. It seems clear that their main attention lies in setting the digitalization seeds and data integration processes to create a one-stop-shop for the Portuguese ecosystem. Nevertheless, this project holds potential to use or integrate blockchain / DLT-technologies in their future development, especially if its intentions are to notarize documents and digital files, streamline faster processes, bring increased security for its digitalized processes, and benefit from the features of auditability, decentralization and traceability to redefine public administration models of trust.

Targeting these objectives, the tangents with the UOI and EBSI become clear. The Unique Object Identifier proposal is a network-solution enabler for current stand-alone solutions (silos) to become interoperable on the level of detail that is required. UOI eases the complexity of identifying and interconnecting multiple different data-sources and applications for any data about (parts of) a particular building. We see that it extends the already holistic approach of BUPi to integrate additional sets of data as follows: construction materials and methods used in the building process; the ability to track and update a building's eco and carbon-footprint through its long-lasting life cycle; adding an important digital information-infrastructure for the construction and renovation sector; integrating it directly in the European Green Deal goals; and supporting dynamic and innovative public administration sectors.

In addition to BUPi, the UOI provides an important missing link in the existing data landscape. It contributes to the Green Deal and other climate objectives related to buildings and urban areas; it gathers relevant data related to energy consumption and energy grid information; it collects information about indoor air quality management; and it supplies chain information about building materials, creating circular economy models where crucial information can follow a building's entire life cycle, including a breakdown of time spent on tasks, activities, etc. These all are new information requirements needed to achieve important international climate and ESG-goals with real estate, such as the "Renovation Wave," the Green Deal taxonomy for buildings, and the circular economy.

BUPi is therefore the perfect blueprint for a UOI-based digital infrastructure for buildings and for integrating with the EBSI. This is especially so as it has been promoted from within the public administration, laying the digitalization groundwork and integrating a disperse set of internal processes into a single data-entry point and an interconnected future-proof network-infrastructure. EBSI is a blockchain infrastructure that offers cross-border public services with the vision to become a network that European Blockchain Partnership members can flexibly use to cooperate. It aims to connect existing solutions or integrate specific services related to public administration. Both the UOI and BUPi concepts / projects are a perfect fit.

Additionally, integrating BUPi and the UOI in the EBSI would provide benefits in streamlining administrative processes by harmonizing data at a pan-European level. This would reduce efforts for checks and audits with other entities while also reducing the burden for cross-border information sharing and synchronization with other EU organisations / agencies / citizens. Existing EBSI-building blocks, like self-sovereign identity, notarization of documents, diplomas and certificates can seamlessly be integrated by the UOI and BUPi. EBSI could enhance trust in members and external stakeholders through the use of the EBSI Wallet with Self Sovereign Identity (EBSI SSIF) and Verifiable Credentials and EBSI. EBSI will also enhance security, resilience and performance through the use of local copies of apps and data and interoperability with existing systems. It will increase transparency and traceability of transactions and data managed in cross-border services and provide data harmonization due to distributed ledger technologies, which will increase reliability of records and easy detection of anomalies. It is also GDPR compliant and in compliance with eIDAS. Using blockchain distributed ledger technology and the possibility to deploy smart contracts would also increase trust of the users towards the procedures and data handling.

A closer relationship between BUPi, the UOI and the EBSI is a match waiting to happen, and a true lighthouse-project for many other countries. We strongly recommend exploring all avenues that could, within the context of the current EU resilience and recovery facility (fund), produce a pilot project to be integrated in selected Portuguese municipalities such as what has currently been developed within other European governments, namely Holland, as well as private initiatives across the globe. The ultimate goal of such a project would be to foster the system innovation needed to bring to public administration the simplification of data collection while providing new levels of trust, accountability and transparency to processes and data. •

The author would like to thank Jo Bronckers and Carlos Oliveira for their comments and insights. All opinions are of the responsibility of the author.

Sources:

» *BUPi website, Enhanced Informations management in (re)constructing and operating buildings (INATBA, 2020), EBSI webpage*

Digital Assets

Blockchain technology contributes new ideas in the area of real estate financing and has the potential to change the market over the long term.

Authors: Walter Strametz, FIBREE Co-Chair - Zug (Switzerland), Christoph Urbanek, Attorney at Law - Vienna (Austria), Armin Redl, Associate - Vienna (Austria)

It sounds too good to be true: digital assets that are offered and sold on an individual website independent of third-party platforms. Some individuals can't wait to use blockchain technology for their company; others have not yet made up their minds as to whether they should join in. Meanwhile, security token offerings (STOs) compete for pole positions for the new asset class.

Behind the catchwords "digital assets," "security tokens," "NFTs," and "decentralized financing," is the digitization of rights (e.g., profit participation rights or participation in a company) using blockchain technology. For example, a digital issuance of shares or their trading can be cumbersome with traditional means. While establishing a shareholder company is not a problem, public trading on a stock exchange is associated with weighty requirements and high costs due to consumer protection. Using blockchain technology, digital stocks can be implemented and traded easily and securely, even on individual company websites. Whether the business model behind an investment is successful or whether the publisher of digital assets is trustworthy cannot of course be predicted.

Already Known Concept: Crowdfunding

To overcome some of these hurdles, a comparison to a well-known model of fundraising helps. Crowdfunding is already a reality for many small investors. These platforms attract returns of 6 to 8 percent in an economic environment of low interest rates. Compared to the USA and China, the European alternative financial markets are in their infancy but are growing at 50-100 percent per year and are already an important source of finance for smaller companies (SMEs). The low interest rate environment and simpler and uniform regulations will further fuel the market in Europe.

Blockchain technology enables investing with ease on crowdfunding platforms. From the platform's point of view, while a simple excel sheet would track investments and disbursements, blockchain technology provides the technological advancements necessary to truly profit from this type of investment. With blockchain-based tokens, invested shares can be traded, thereby enabling and simplifying longer-term business models or investments in several projects. For example, the issuance of shares (whose contribution is not repaid) or of profit participation rights, such as a right to the operating success of a property (as on Crowdlitoken.com).

An important aspect for the real estate sector is that with blockchain technology one is no longer dependent on external platforms but can offer a secure channel for one's own digital assets via one's own website; the "self-made" digital assets nonetheless, thanks to the blockchain standard, remain tradable and immutable.

Digitization of an asset (i.e. the technical implementation) can be carried out within a few weeks. The business model and its regulatory protection requirements have many conditions and can be challenging to fulfill. It helps to ask the following questions:

With Whom or Where do I Offer my Assets?

The placement of an offering in a private group or with purely professional investors is much easier to manage in regulatory terms than a public offering. Depending on the investment volume, national regulations, including those of the Capital Market Act or the Alternative Financing Act, must be observed in addition to the requirements under European law.

How Much Should the Digitized Asset be Offered for?

The following are simplified threshold values in Austria and the EU:

- *<EUR 250,000: No prospectus*
- *> EUR 250,000 and <EUR 2,000,000: Simple information sheet in accordance with the Alternative Financing Act*
- *> EUR 2,000,000 and <EU 5,000,000: For security tokens, simple prospectus in accordance with the Capital Market Act.*
- *> EUR 5,000,000: Prospectus according to EU prospectus regulations.*

How Should the Assets be Traded?

If assets are only traded directly between the existing investors (peer-to-peer), this does not pose a problem. If trading is done via a platform, further regulatory aspects must be taken into account. Tradable (security) tokens are also gaining in importance due to the increased use of traditional financial institutions in the area of tokens. Just recently, Commerzbank and Deutsche Börse announced a marketplace for digital assets (tokens) in cooperation with Fintech 360X. In Switzerland, the "Swiss Digital Exchange" (sdx.com) - a platform for digital assets - is expected to be launched soon and will operate the Swiss stock exchange, among other things.

When Will the use of Blockchain Technology Become Widespread?

The authors assume that the development in connection with tokens, especially through the European MiCA regulation (Markets in Crypto-Assets regulation), which is currently available as a draft, will bring an upturn and movement in the market. The planned regulation is intended to create a harmonizing set of rules, especially in the area of utility tokens, with security tokens being explicitly excluded from the planned set of rules. ●

Walter Strametz brought blockchain-real.at to life, digitized assets with element36.io and built the investment platform for crowdlitoken.com (invest from 100 EUR in 16 mCHF real estate bonds).

Buying Real Estate with Cryptocurrency: From a Luxury Miami Apartment Block to Tokenized Investments

Author: Yael Tamar, FIBREE Co-Chair - Tel Aviv (Israel)

The History of Crowdfunding

Though the idea of a group of individuals offering money to support a project or fund can be traced back to the 1700s, when the author of Gulliver's Travels, Jonathan Swift, set up the Irish Loan Fund for low-income families in Ireland, modern crowdfunding traces its roots to 1997. That was the year that the British rock band, Marillion, funded their reunion tour through online donations from their fans. This in turn led to the establishment in 2000 of ArtistShare, the first dedicated crowdfunding platform.

As the internet became more popular, and more businesses created an online presence, crowdfunding experienced a major growth in the early 2000s and quickly became a tool for small businesses and entrepreneurs to fund their personal journeys by appealing to a large network of online individuals.

There are more than 250 crowdfunding platforms now active. In the case of new technologies or even the publication of books, platforms like Kickstarter or Indiegogo set goals and a timeline for a capital raise, often giving the investors first rights to receive the product when it is ready. An investment can start as low as $100 and reach up to $100K. Once the objectives are achieved, the project is removed from the platform.

Crowdfunding and Real Estate

Crowdfunding is a relatively new type of funding mechanism for real estate and is based on the passing of the JOBS (Jumpstart Our Business Startups) Act in the US in 2012. Intended to encourage the funding of small businesses by easing security regulations, the JOBS Act allows crowdfunding to be used by private companies and private investment projects to raise money from the public.

The crowdfunding of real estate assets requires all transactions to take place online through an SEC-registered intermediary, either a broker-dealer or a funding portal. It permits a company to raise a maximum aggregate amount of $5M through crowdfunding offerings in a 12-month period. It also limits the amount individual non-accredited investors can invest across all crowdfunding offerings in a 12-month period. If for example, a project claims to have raised $40M through crowdfunding, it has in fact only raised up to the maximum through the Crowdfunding Regulation while the rest of the money was raised from accredited investors.

Crowdfunding also requires disclosure of information in filings with the SEC and to investors and the intermediary facilitating the offering.

With its many benefits, crowdfunding quickly became a popular fundraising tool for real estate. A larger number of individuals, of varied financial backgrounds, were able to invest in a wide variety of properties without having to deal with mortgage brokers, real estate agents or contractors. There have been times when a listed property is oversubscribed within minutes.

The current volume of real estate investments through crowdfunding is growing at a fast pace as more people enter this online space and as regulations are expected to change for the better. The definition of an accredited or sophisticated investor is shifting, which may be the first of several transformations in the regulations, making way for more accessible, democratized investing. With these regulatory changes, experts predict that this market will skyrocket to more than $900 billion in crowdfunding investments.

The returns from real estate crowdfunding investments vary and it is important to diligently research and choose where best to invest.

How Crowdfunding Works

Crowdfunding is the use of small amounts of capital from a large number of individuals to finance a new business venture. Depending on the type of crowdfunding, investors either donate money altruistically or receive rewards such as equity in the company that raised the money.

An SPV (Special Purpose Vehicle) is created with multiple players, i.e., a "general partner," and the project sponsors (who own the majority of the project). On the other side, online investors invest money in debt or equity that is used for project investment.

Both investors and developers or asset owners enjoy a number of advantages through crowdfunding. These include:

Benefits for Investors:

- *Accessibility. Investors receive access to deals they could not have accessed before.*
- *Diversification. Investing a lower amount of money in one specific project allows you to diversify investments by placing your money in more than one project if you choose.*
- *Speed and flexibility. There are online tools that aid in studying the algorithms and analytics of a specific investment that also enable quick actions.*
- *Transparency. Crowdfunding allows following other investors' actions and there is immediate availability of information through the platform.*
- *Higher returns. New asset classes provide higher returns, often between 8% and 25%.*
- *Lead investors. Invest along with industry experts.*

Benefits for Developers and Asset Owners:

- *New financing options with a new base of investors and capital. The platform allows for managing data and transparency.*
- *Lower costs compared to traditional funding.*
- *Marketing benefits. The platform allows marketing to young people such as millennials who invest online and who are likely to repeat it over and again.*
- *Cutting out the middlemen. It is now possible to invest in assets directly without a costly middleman (even though the crowdfunding platforms charge fees).*
- *Access to international properties beyond the investor's physical location/residence.*
- *A shorter transaction cycle for online investments.*
- *Wider exposure of assets to a larger pool of investors.*

Crowdfunding vs REITs

When comparing the benefits of investing in crowdfunding to investing in a REIT, a traditional real estate investment trust that owns, operates, or finances income-producing properties, crowdfunding clearly emerges as the tool that allows investors more control. Crowdfunding also allows investors to focus on a single asset investment based on geography, real estate sector and specific properties. While REITs generate a steady income stream for investors, they offer little in the way of capital appreciation. They are, however, protected from the market's volatility.

Limitations of Crowdfunding

There are a number of limitations to crowdfunding–for investors and project owners–which are important to recognize. These are mainly due to the maximum amount crowdfunding sites are allowed to raise. In addition to fees from the crowdfunding platform, there is also a lack of liquidity.

Another disadvantage to consider with crowdfunding is the fact that these projects that are raising funds are usually open for investments at the beginning of their project's cycle when the risks are highest and the returns are highest. In this case, investors who are not sophisticated enough may lose their funds. Even if an option to invest at a later stage exists, it usually happens once the project is sold (a yielding asset), and is therefore not as lucrative at that stage as the investment risk is much less and so is the interest (about 5% to 7% for participating in that asset).

Limitations for Investors:

- *Choosing the right platform. With so many platforms out there, it is ever so important to choose the right one.*
- *At-risk projects won't get funded.*
- *Unprofessional management. There is a risk these projects may not be as professionally managed as REITs that have professionals choosing the best projects for investment.*
- *Liquidity considerations. It may or may not be possible to resell the project holding.*

Limitations for Project Owners:

- *Real estate crowdfunding is still relatively in its early days.*
- *May require other funding sources. Due to the regulations, it is possible to raise only up to $1M which may not be enough for the project.*
- *The due diligence process of the crowdfunding platform itself must be followed.*

Crowdfunding vs Tokenization

Overall, crowdfunding holds many benefits as it has created a new space where individuals are becoming used to buying and selling real estate online, and it is a convenient way to raise funds. Yet, as mentioned above, crowdfunding does have some limitations.

What is tokenization, and is it an alternative option to crowdfunding? In regards to assets like real estate, tokenization is the process of issuing a security token using blockchain technology. The token represents a fraction of the asset, similar to digital securities, and digitally renders the asset tradable.

Tokenization, in addition to having the beneficial elements of crowdfunding such as the online and marketing perks, and the ability to invest in lower amounts and thereby retain more money for diversification, also offers other advantages. Tokenization allows for liquidity, the ability to invest at any project stage, and flexible financing models and structures. With tokenization, it is possible to participate at any stage of a project's life-span according to the investor's acquired or preferred risk appetite.

Whereas once a crowdfunding project has reached its goals, it is removed from the platform, when working with a real estate digital marketplace like SolidBlock, the asset never leaves the site. This allows for a continued trading of the tokens.

In conclusion, the crowdfunding mechanism has opened up the world of real estate investments to a previously untapped market of investors and will continue to grow in popularity in the coming years. Tokenization and the use of blockchain technology is also on the rise and offers benefits that crowdfunding cannot offer, mainly even more freedom for investors to trade at will and obtain liquidity that is not available through crowdfunding sources.

Real Estate Crowdfunding Case Studies

Illustration A – Hard Rock Hotel Palm Springs, July 2014

Kittridge Hotels & Resorts/Realty Mogul
$1.5M raised to refinance/renovate
85 investors received VIP benefits
The former Hard Rock Hotel, now Hotel Zoso, is being run by a Portland-based receiver.

Illustration B – BC Bacata Tower

Mixed use project in Bogota, Columbia
$175M raised from 3500 investors
This architectural complex was begun in 2011 and is still under construction, featuring the tallest building in the country,

Illustration C - 3 World Trade Center

$2.49B Total Project Cost
$2M Funded with debt crowdfunding
5% Tax-free interest secured bond
One of the most iconic towers in New York City, 3 World Trade Center was partly funded by regular individuals. •

Blockchain-Based Climate Action in the Real Estate Industry

Reduction of carbon emissions through transparent, trustable and liquid real estate markets.
Author: Stefanie Behrendt, FIBREE Co-Chair - Athens (Greece)

Climate change is happening right now and must be seen as an existential threat for humanity. We need to reach net-zero emissions by 2050 in order to be able to prevent the worst damage to our planet.

This pressing topic can be solved by cutting edge technology that facilitates collective action to fight climate change. One of these highly effective and potentially game-changing technologies is called blockchain, a system without central authority that is used as a trustable data storage.

Amongst other things, blockchain enables every stakeholder in the real estate industry, no matter if company, government or individual, to contribute to tracking and calculating carbon emissions. Therefore, blockchain helps us evaluate the carbon footprint of any type of building project and to showcase the impact of our actions.

How Blockchain Technology is Changing Real Estate

If we look back on 2019, we have already seen how one single infected person can change the entire world in a few weeks' time. In regards to blockchain, it took only one single transaction in 2009, when bitcoin first appeared.

Interestingly, there is no requirement to understand the technical details of blockchain and how it works in order to use it. The same could be said for the majority of people who do not understand exactly how the internet functions. What blockchain has become today can be compared to what the internet was like in the early 1990s. We are on the edge of comprehending the endless possibilities of how blockchain can function within our lives, fully expanding our imagination of what the future, specifically of real estate, may look like.

Building materials stored in a blockchain based-solution; voting systems run by decentralized networks; paperless real estate transactions conducted in seconds; smart contracts run on the blockchain without the need of a third party. These are some of the possibilities that will open a window of change regarding the time and energy that can be used to take decisive action towards climate change.

How are Real Estate and the Need for Climate Action Connected?

Real estate is the largest investment asset class worldwide, responsible for 40% of all greenhouse gas emissions and consuming 50% of global raw materials.

As mentioned, blockchain can enable better execution of building projects through the recording of building materials, facilitating decision making between all stakeholders of a specific project, and saving costs and time during the transaction process. These innovative uses of blockchain benefit the individual as well as the collective impact on our climate.

Thus, the real estate industry has a huge role to play in the reduction of, among other issues, carbon emissions.

What is Needed to Drive Change in the Real Estate Industry?

Blockchain is called a disruptive technology for a reason. It disrupts the way we've been conducting business and shows an alternative possibility, especially regarding how real estate is becoming a digital asset.

A new generation will be key in driving change in the real estate industry. Naturally, tech savvy Gen Z and Millennials are going to prefer easily accessible peer-to-peer interactions over costly time consuming transactions that involve third-party financial institutions. Why not improve liquidity by trading real estate digitally in seconds, and at the same time lowering costs?

Furthermore, the changes brought by Covid-19 are a catalyst for the radical move towards digitalization of real estate. In other words: Corona forced us to be resilient, overcoming obstacles by adapting to digital solutions.

What are the Challenges When Adapting Blockchain-Based Solutions in the Real Estate Industry?

Blockchain can help not only a large group of people to reach consensus but can also allow individuals to agree on any kind of contract or transaction peer-to-peer. There are hurdles, however. Anonymity and automation can cause challenging situations. Therefore, a global legal and regulatory framework for blockchain use in real estate and behavioural changes in our economy and society are required.

The tracking of people through applications and by digital surveillance is most likely creating the rapid increase in the use of digital identities. The uses of digital identities can have many applications, both positive and negative, for financial institutions. In preventing fraud, for example, a customer's identity can be confirmed by verifying the digital identity of that customer. Enforcing KYC (know your customer) and AML (anti-money laundering) regulations during business transactions is beneficial for both parties. This development is further facilitating the process of digitizing the real estate industry. There is a high risk of misuse and therefore this topic needs to be handled with the greatest of care.

Many companies currently offer their online services for free or at a reduced price. This unlocks the gates to an advancement of the digital economy. A major leap towards technology has already taken place and to be able to be part of a modern economy, trust in innovation is a must.

Furthermore, a trending collaborative attitude will strengthen the advances of the shared economy (made popular by Airbnb and Uber) and peer-to-peer transactions. Blockchain will enable the public and private sectors to collaborate under one umbrella.

How can Blockchain in the Real Estate Industry Drive Future Environmental Change?

Real time transactions without middlemen and major innovations are transforming our day-to-day lives. Evolving technologies such as artificial intelligence, machine learning, virtual reality, IoT, cloud computing and automated robotics are the new normal.

Mass adoption of these disruptive technologies will not happen overnight. A decade ago, on April 3, 2010, the first iPad was released. How will all these new technologies and movements influence us by 2030 ?

In terms of the changing climate, global warming will cause more severe storms, floods and forest fires that will force us to take climate action. If we look to real estate, there is evidence that the integration of blockchain will save time and money in this industry. We can use these saved resources for facing major challenges during the climate crisis. •

FIBREE Investor Research 2021

Author: Denis Petrovcic, FIBREE Co-Chair - Ljubljana (Slovenia)

A key indicator for any nascent industry is, amongst others, how much money is being invested into it on a global level. Furthermore, FIBREE looks to compare funding related accomplishments into blockchain-enabled real estate solutions with those of the Proptech, blockchain and the crypto industries. The comparison with these three much more mature industries is interesting, allowing us to observe the emergence of a niche global movement at their intersection in a wider economic context.

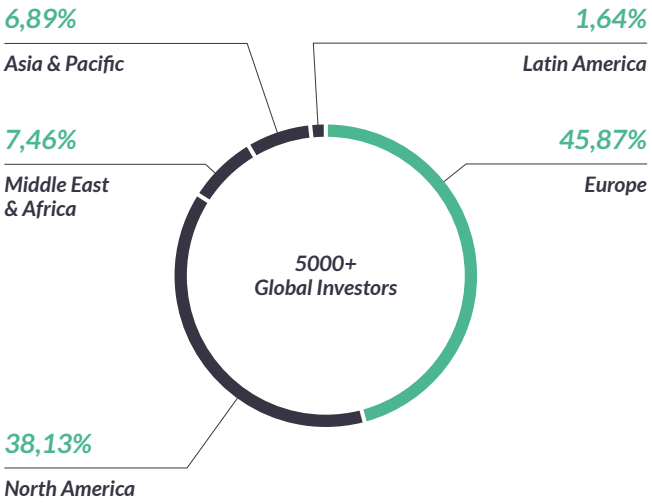
Comparing the more mature three industries - Proptech, Blockchain and Crypto - they have all followed similar trajectories of investment growth over the past ten years. Still, looking at professional investments in these industries from a high level perspective, it is inevitable to see they are all but a small fraction of the global venture capital markets. For instance, blockchain VCs make up less than 1% of the global VC market.

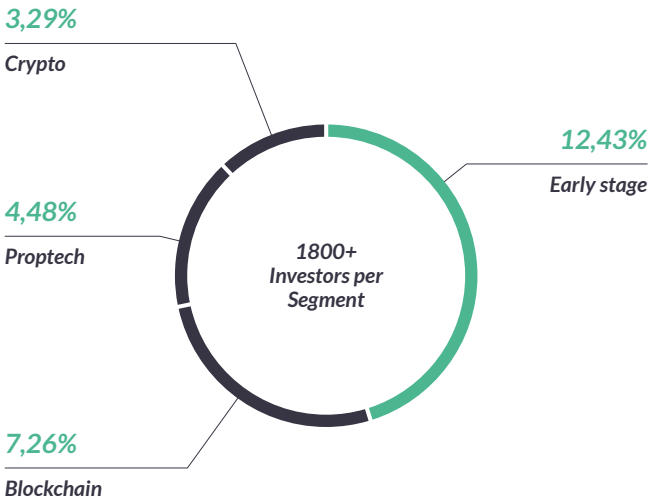
A significant obstacle for growth of blockchain for real estate solutions has been a lack of open investment data about this nascent industry, even simple information like how much has been cumulatively invested, and comparables information are often impossible to get hold of. Without data, VCs can't confidently engage with companies providing blockchain-based solutions for the real estate industry. Thus, even the greatest, most innovative companies are less likely to receive substantial investment on fair terms.

FIBREE aims to close the gap that currently exists on the intersection of blockchain, proptech and crypto. This year our research team has started mapping out investors showing interest in the space, with the goal of supporting the growth of this young industry by facilitating investor decision making in the years to come.

Throughout our research, FIBREE analysed 5000+ VC investors globally, and found 15% of these investors show interest in either Proptech, blockchain or crypto startups. What's more, about 12% are focused on "early stage" investments, making them relevant to an industry where most companies are still in the formation or market validation phase. In fact, out of the 390 products listed in our database, only 30% have been used by at least 3 external market players or customers.

This 3rd edition of the FIBREE industry report marks the very beginning of a curated investor database that in time aims to become a tool to facilitate investor decision making process and startup fundraising activities. We invite both sides to engage with FIBREE to collectively increase the quality of investment related data. Only when we all actively contribute to the research findings in this niche topic, fragmented information can become valuable, driving adoption further, opening the door to larger investors seeking new opportunities in a young and fascinating industry on the horizon. •





The State of Blockchain in Real Estate 2021

Authors: Jo Bronckers, FIBREE Chair - Amsterdam (The Netherlands), Florian Huber, FIBREE Chair - Vienna (Austria)

As in the two previous years, in the run-up to the release of the Industry Report, FIBREE assembled an international working group to examine the state of blockchain in real estate. This year's working group started in early 2020 with last year's product database as a starting point.

Methodology

The first step was to check the website and the Linkedin profile to make sure that the products already known are still up to date. All questionable products are initially earmarked not to be included in the product database by 2021, but not yet definitively removed. This was the first step in the working group's desktop research.

As a second step, online listing platforms such as ICO Bench and Crunchbase, as well as Linkedin, were used to search for new products that were not yet in the product database using keywords around the narrow space of blockchain and real estate. As soon as new products have current listings on the online platforms and also have a working website, they are added to the product database. In the same time we reached out to all 125 FIBREE Regional Chairs with the request to check the listings in their region and provide additional or amend wrong information to the database.

By the end of April 2021 the database showed roughly 405 start-ups globally. Using this set of data we reached out to those companies via e-mail with a detailed survey to gain deeper insight within the industry. 27 fully answered questionnaires returned helping us to deepen the analysis which you find further below.

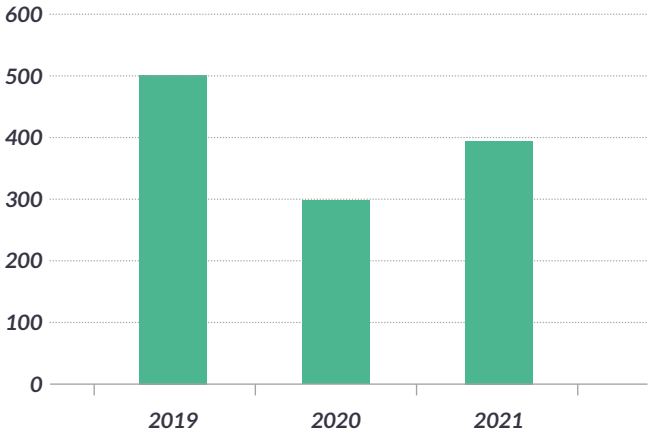
To finally verify whether any additional changes in the product database could be observed we left the desktop research open until mid June 2021. By closing the research-period, we can announce 394 products are listed in the 2021-edition of the worldwide FIBREE Product-database for blockchain and real estate.

Database Insights

In this article we will highlight the most important insights and results of the 2021 product database analysis together with several comparisons of previous years results. The first focus will be on general findings, eg. how many products are found and their geographical distribution, their product-focus, growth stages and their so-called entry points. This is followed by a more in depth analysis of the findings in each of the 8 different defined product categories.

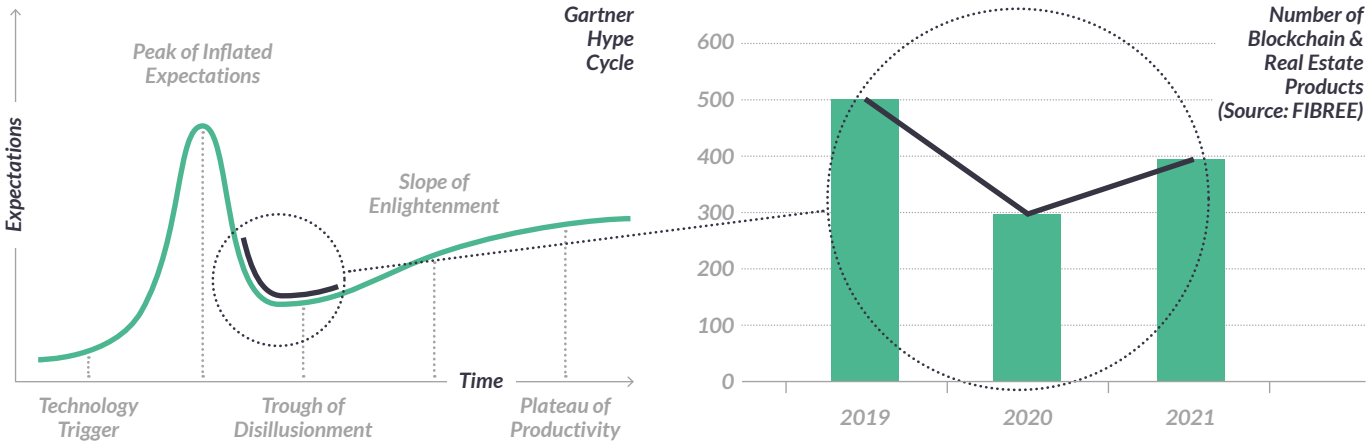
Number of Products

This year is the third year FIBREE conducts this global Blockchain and Real Estate-survey. This allows us to compare the results of all these years with one another. Starting in 2019 with 501 products, followed by a 40% drop towards 297 products in 2020, we see that the number of products in 2021 increased again with more than 30% to a total of 394 products. In terms of the Gartner Hype Cycle[1], these figures might indicate blockchain and real estate has - on a global level - left the bottom of the so-called 'Through of Disillusionment' behind. The future will tell us if this is really the case and if this is happening everywhere in the world simultaneously.



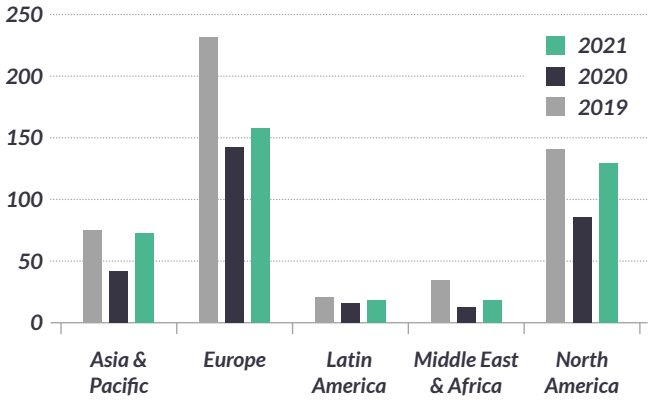
Number of blockchain & realestate products in the database

1 *See: https://www.gartner.com/en/research/methodologies/gartner-hype-cycle*



Geographic Spread

In previous editions it already became obvious that the action is happening everywhere around the world. Most blockchain and real estate products originate from Europe and North-America, with Asia & Pacific in third place. When looking at the figures for this year we notice the start of a slight balance-shift. The growth-pace in the various continents is obviously different, as illustrated in the figure below. After the decline in 2020, both North-America and Asia & Pacific saw a strong increase again in 2021, where all other continents only showed a small growth of the number of products listed. Europe is perhaps the most striking, because a strong decline in 2020 has hardly been followed by a returning growth in 2021, like in North-America and Asia & Pacific. However Europe is in 2021 still the continent with most of the blockchain and real estate products, it might be losing its leading position in the next few years. When extrapolating the most recent growth-figures, we think it is likely North-America or even Asia & Pacific will surpass Europe soon.



When looking more closely at individual country-levels, we see the continental shift back in the fastest growing and falling countries in the world.

Top 5	Fastest growing countries	Fastest falling countries
1	USA (+36)	Germany (-9)
2	UK (+10)	Switzerland (-7)
3	Italy (+9)	Netherlands (-3)
4	Singapore (+8)	France (-3)
5	Canada (+7)	Belgium (-2)

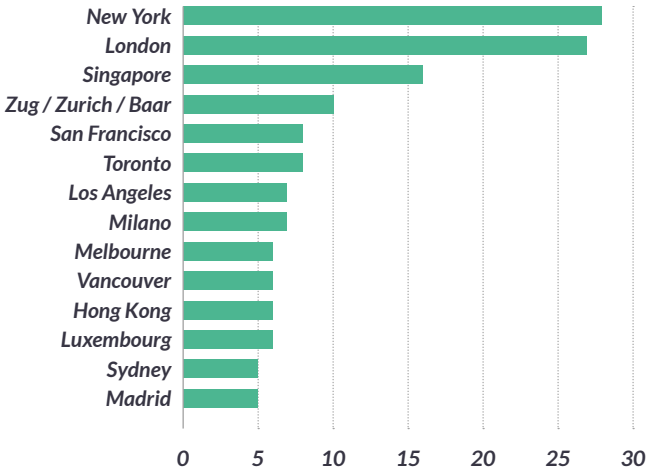
Continental spread development

The biggest shifts, both growing and falling, occur in the countries that have the most products listed. Like previous years, this year's product database shows that the action is happening in many different countries around the world. A few of which have a relatively large number of products listed and many countries with only one or two products. In total the 394 products in the 2021 product database come from 57 different countries, of which 29 of them (50%) have only one or two products listed. Only 11 countries are having more than 10 products in the product database. The table below shows the evolution of their ranking of these 11 top-countries during the past 3 years.

The USA and UK maintained their position as leading countries in the world. Followed by Australia and Canada who both climbed several spots in the ranking and share this year's 3rd position. This position was shared last year by Switzerland and Germany which dropped in this year's ranking to a respective 7th and 9th place. Singapore dropped from 3rd in 2019 to the 10th position last year, but strongly came back with a 5th position this year. This 5th position is shared with Italy, a country that - different from many other European countries - climbs fast for the second successive year in the global ranking, coming from the 16th position in 2019. The opposite is happening with The

Country	Number of products, 2021 (delta with 2020)	Ranking 2021 (delta with 2020)	Ranking 2020 (delta with 2019)	Ranking 2019
USA	108 (+36)	1 (=)	1 (=)	1
UK	34 (+10)	2 (=)	2 (=)	2
Australia	21 (+6)	3 (+2)	5 (+2)	7
Canada	21 (+7)	3 (+3)	6 (+5)	11
Singapore	16 (+8)	5 (+5)	10 (-7)	3
Italy	16 (+9)	5 (+6)	11 (+5)	16
Switzerland	13 (-7)	7 (-4)	3 (+1)	4
China	12 (+3)	8 (+1)	9 (+5)	14
Germany	11 (-9)	9 (-6)	3 (+5)	8
Netherlands	11 (-3)	9 (-3)	6 (-1)	5
Spain	11 (-1)	9 (-1)	8 (+2)	10

Netherlands, this country is for the second year in row falling on the global ranking, from position 5 in 2019 to position 11 this year, which is shared with Germany and Spain.



Top 14 Blockchain & Real Estate Capitals in the world

For the second year in a row, New York can be called the leading capital in the world for blockchain and real estate. After taking over the lead from London last year, the British capital is coming back strongly this year. Whereas last year, New York was clearly ahead of London, this year they are competing for the leading position with 28 and 27 products respectively. Other notable trends are the decline of formerly 'established' European cities in the toplist of capitals, like Berlin, Amsterdam and Munich or outside Europe, like Dubai. Their position has been taken by 'new' European blockchain and real estate capitals, like Luxembourg or Madrid, but mostly by multiple new capitals in North America and Asia & Pacific.

New Key-Criteria for a Better Overview

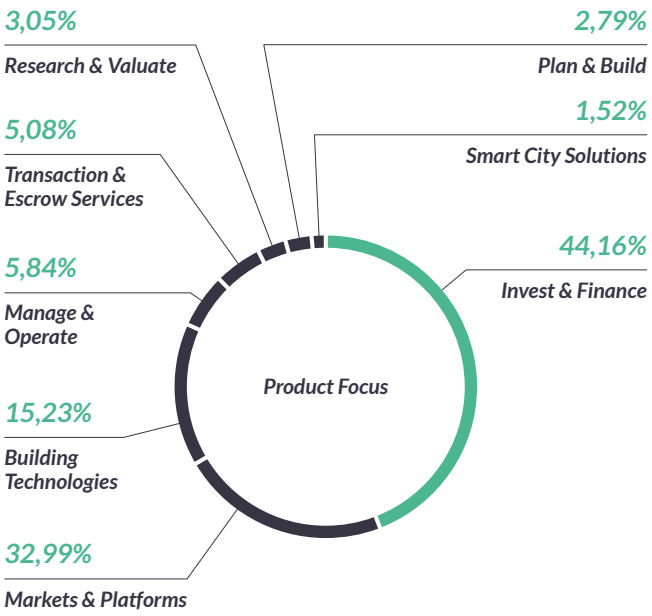
Based on the methodology and the learnings of the last two Industry Reports one of our biggest goals for this year's issue was to emphasis and level up the quality of our research, thus defining new key-criteria to help market participants understand better where the effort towards the technology of blockchain is coming from and where start-ups are heading to irrespective of which growth stage they are in.

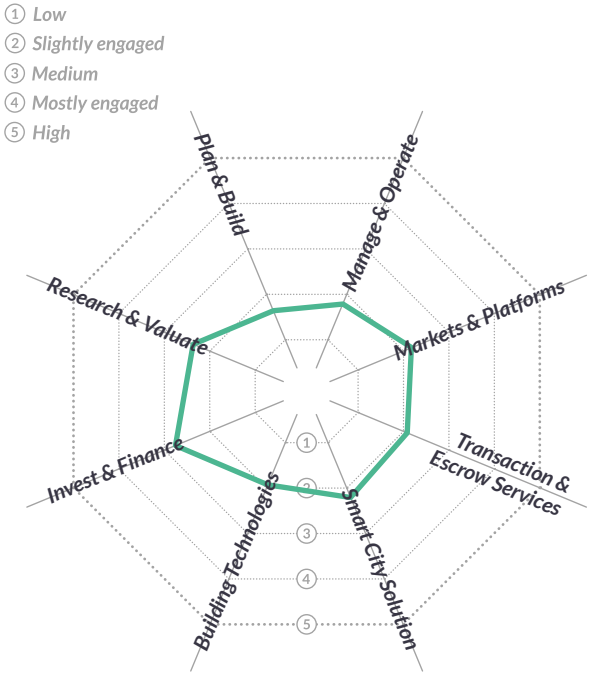
Product Category

We defined eight product categories, which stand in close relation to the real estate life cycle and cover the most important segments of the market, thus being able to undermine the findings out of the perspective of our local representatives, current market players and the working groups desktop research. A brief overview can be seen below and more detailed in the specific analysis of each segment at the end of the article.

- ***Plan & Build*** *- Any product start-up that offers services and solutions as architects or construction.*
- ***Markets & Platforms*** *- Any product that lists real estate related products or services and connects the needs of different market participants.*
- ***Transaction & Escrow Services*** *- Any product that supports market participants in any kind of transaction.*
- ***Smart City Solutions*** *- Any product that offers solutions for cities and municipalities.*
- ***Invest & Finance*** *- Any product that focuses on the investment and loan providing market for real estate.*
- ***Research & Valuate*** *- Any product that offers services related to any data out of the real estate market.*
- ***Building Technologies*** *- Any product that offers software development*

The figure below shows the distribution of the different product categories in the total database of 2021.





Entry Points

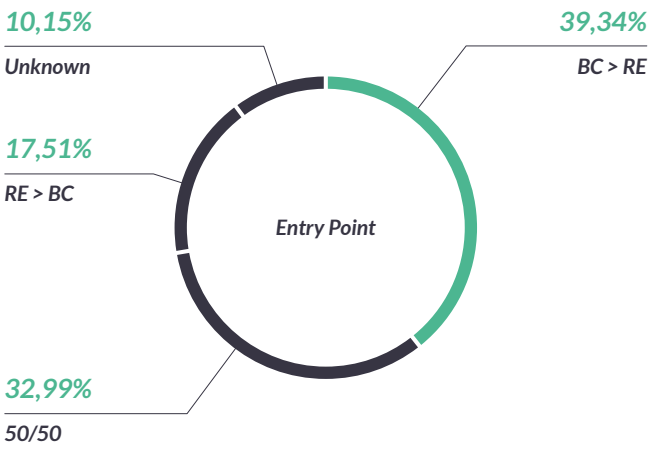
It is evident that there is a strong foundation of entrepreneurs giving a clear sign that blockchain technology is not only a buzzword. This is what we discovered within three years of research. Reaching the peak of inflated expectations, followed by a decline, it seems that we now are slowly marching out of the trough of disillusionment. We are also experiencing an increasing interest by real estate organisations to start implementing blockchain solutions as value add to their existing processes. A good example is a real estate developer who decides to attract a part of the project-funding via token-offerings, next to own equity and bank loans. Besides that it provides him with faster project-funding, it is also a first step to discover in real praxis the potential of real estate-tokenization and the effects it can have on their business model.

Strong products can be seen on both sides of the market. That's why we decided to create the key-criteria of the "'Entry Point", to see where the initiative is actually coming from.

The entry point of "Blockchain to Real Estate" encourages technology start-ups and entrepreneurs to approach the real estate industry with new solutions while vice-verca the entry point of "Real Estate to Blockchain" explains that coming from the real estate market, solutions have been developed out of the need that digitization is an important means to change current processes in daily routines.

Often it was not quite clear which side actually is the driving force behind the product development, thus leaving it open to

an equal approach of "50:50". Together with the FIBREE growth stages this can be seen as an indicator about the level of market adoption of blockchain backed digital solutions for the real estate industry.



FIBREE Growth Stages

When looking at the market's activities in 2019 most of the start-ups and products suppliers were early adopters and early stage ventures. Maybe a small percentage of those in the product database already were running a solid business. We received frequent requests from real estate organisations who would like to know which products in the database had already found their way to market adoption. This brought us to the idea to look more closely at the different growth stages of those which evidently are still offering their services and those who are still under development or in their earliest new to the market implementation efforts. We defined 3 growth stages to distinguish these new product-suppliers. Once the market adoption of products grows, additional growth stages can be added. The current 3 stage are:

» ***Growth Stage 1:*** *Still under development/ Proof of concept/ Prototype*

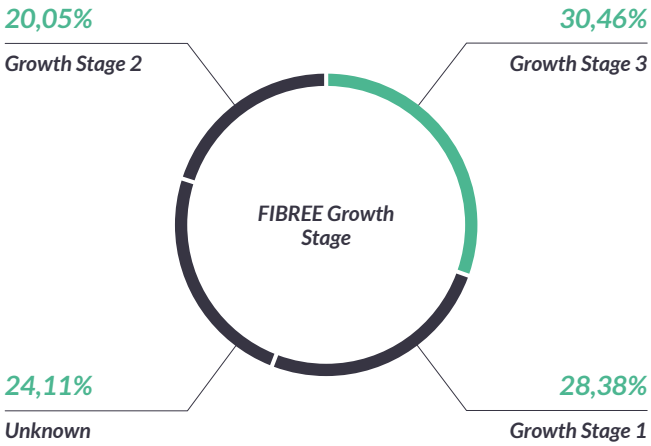
Any start-up that cleary communicates via it's website that the product is still under development and/ or traction can not be detected yet. This stage primarily was indicated by the year of incorporation stated in the imprint.

» ***Growth stage 2:*** *Between MVP and already in use by three external market players*

Any start-up that shows first traction and success stories to be found on the website and/ or indicated by the year of incorporation stated in the imprint.

» ***Growth stage 3:*** *Already in use by more than three external market players*

Any start-up that by year of incorporation indicated by the imprint shows a clear track record and/ or gives the impression of a full functional product.



A Close up on the Different Product Focuses:

Invest & Finance

Key Facts:

- ***Number of products:*** *174*
- ***Average score spider diagram country pages:*** *2,78*

This is - by far - the most common category in the 2021 product database. With 174 products, almost half of all blockchain and real estate products fall into this category. But in fact there are many more. Many products are classified in another category, but also have common ground with invest & finance. This shows once again that the real estate sector sees a lot of value in the irrefutable recording of digital information exchange in the case of financial interests between parties.

We asked participants at an in depth-survey among product suppliers for what purpose they use blockchain technology in their product-proposition. For answering this question, participants were allowed to select more than one purpose from a list. The table below shows how it was responded to by all suppliers in the product-category Invest & Finance.

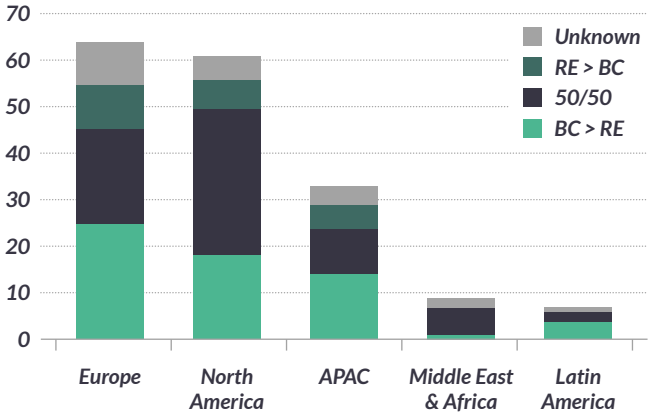
Purpose	Percentage
Tokenizing (providing identity & ownership structure)	*23%*
Smart Contracts (proof of purchase)	*18%*
Digital ledger (asset, transaction, business registry)	*15%*
Facilitate digital (crypto)payments, crowdfunding & digitize fiat-currencies (DEFI)	*15%*
Transparency, data security & audit trail	*13%*
Facilitate transactions (marketplaces)	*11%*
Providing escrow services	*3%*
Land registry	*2%*
Workflow management	*2%*

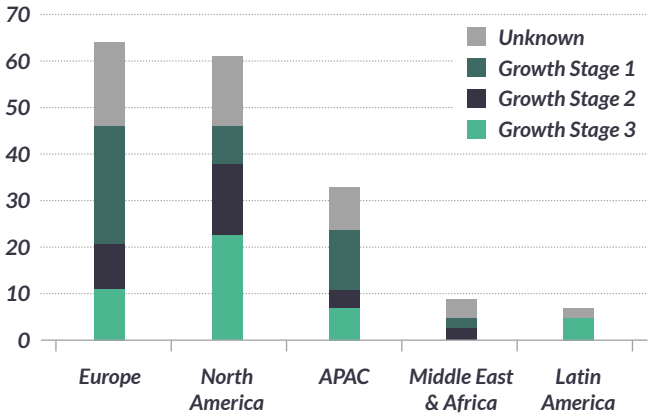
Tokenization and Smart Contracts are stated by almost every respondent, shortly followed by facilitating digital payments and transactions. It becomes also clear that creating transparency and a digital ledger are often included in this category.

In the same in depth-survey we asked participants what blockchain technology they are using in their product. Almost 60% of the respondents say they are using Ethereum. The second most stated blockchain, but on a decent distance, is Bitcoin with 11% mentioning it. Other blockchain-protocols that are mentioned are Ardor, Tezos, Avalanche or own protocols.

Entry Point & Growth Stages

For market take up we believe the entry point, that shows from what direction the earliest engagement in the products is coming from, might be a clear indicator. It is clear that the initiatives for Invest & Finance products are not coming from inside the real estate industry itself. Only in Europe, North-America and Asia & pacific we see a few Invest & Finance products that are initiated by real estate organisations. Most of the products are initiated by pure blockchain-organisations or from a blockchain-developer in a collaboration with a real estate organisation. Perhaps North-America is showing the biggest engagement from the real estate sector with almost half of the products having a 50/50 entry point.





Perhaps this explains why there are significantly more products in North-America that have already reached FIBREE Growth Stage 3. Compared to Europe and Asia & Pacific, there is a clear difference in market uptake. In Europe and Asia & Pacific roughly 35% is still in Growth Stage 1, where in North-America roughly 35% has already reached Growth Stage 3.

What is also striking is that most products in Latin America are already in Growth Stage 3, even though most of them were initiated by a blockchain developer. Because of the small number of products in this continent it was difficult for the research-team to find more statistical evidence that explains this.

In line with the above, it will come as no surprise that the USA currently has by far the most suppliers of Invest & Finance products that are already in a Growth Stage 3. No less than 22 products originate from this country. Australia, India and Brazil share second place on this list, albeit at a considerable distance behind the USA. However, these countries illustrate once again that blockchain and real estate is a global phenomenon and solutions are being developed and offered all over the world.

We asked the in depth-survey participants about the challenges they faced when bringing their product to the market. In this category regulatory constraints and compliance are most often mentioned, almost by every product supplier. Other frequently mentioned challenges are adoption and industry readiness. Technical hurdles and education are also mentioned but only a few times.

Top-6 Leading Countries	*Already in use at >3 external market players*
USA	***22***
Australia	***3***
India	***3***
Brazil	***3***
Netherlands	***2***
Spain	***2***

When looking at how the companies that already have reached FIBREE Growth Stage 3 (Already in use at > 3 external market players) are being funded, we see that exactly 50% of them have attracted more than 1 million USD and the other 50% between 200K and 1 million USD. There is a large variety of funding-sources. Almost 97% say they are funded by more than one source, of which own sources and equity/venture financing are most common.

Source	*Percentage*
Own sources	***38%***
Equity finance / venture capital	***31%***
Family and friends	***14%***
Crowdfunding / ICO	***14%***
Public / Philanthropic funds	***3%***

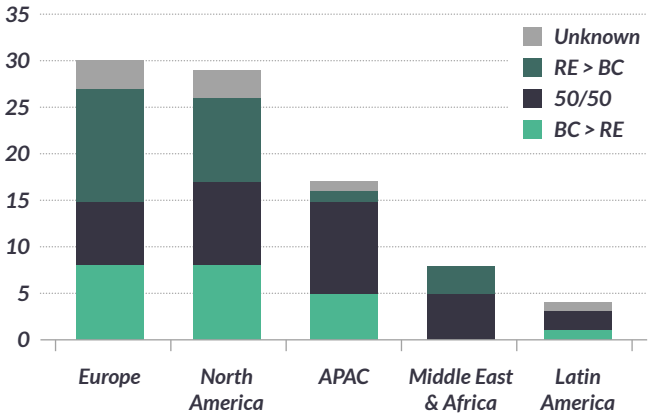
Markets & Platforms

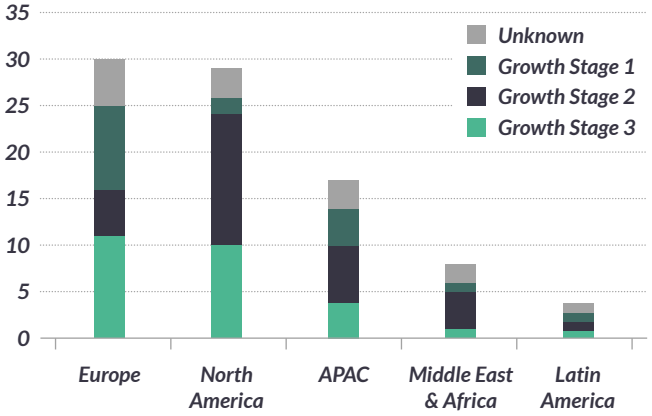
Key Facts:

- ***Number of products:** 88*
- ***Average score spider diagram country pages:** 2,18*

In this category the products are again offering solutions for different purposes. Often tokenization is combined with facilitating smart contracts for targeting the real estate- and construction-industry. Examples are focussing on land title and ownership transfer or rental contract-solutions, others on supply chain and workflow facilitating in the construction industry. Again others are enabling digital transacting of real estate tokens or facilitating escrow processes. What they all have in common is that a digital distributed ledger is used to create data security or audit trails to facilitate the right transparency for the actors involved. It is therefore no surprise that the participants indicate that the target groups for their products cover the entire industry chain.

Entry Point & Growth Stages





Different from the invest & finance-category, products in the markets & platforms-category are much more showing that real estate organisations took the initiative for the product-development. This might also be the reason that products seem to arrive faster at growth stage 2 or even 3. There is no exception to this when the situation in different continents is compared. The 8 leading countries in this category, which are shown in the table below, are therefore located all over the world.

The biggest challenges faced when developing their products are again regulatory constraints, but also solving the product market fit to find clients. Technical hurdles like blockchain-, API- and database-integration seem to be scarce. What is strongly required is education but also larger funding opportunities would be very welcome for accelerating the market-adoption. Looking at the blockchain-technology applied, again Ethereum is leading in this category. Other technologies that are mentioned are HyperLedger and Dragoncoin. When asked how the blockchain-technology brings value to the clients or users, participants answered in random order:

- *cost reduction,decentralization (remove of silos/ data monopolies);*
- *decentralized finance (DeFi);*
- *disintermediation;*
- *increased liquidity;*
- *speed through automation;*
- *transparency;*
- *trust;*
- *reduced risk through immutability.*

Top-7 Leading Countries	*Already in use at >3 external market players*
Canada	*6*
USA	*4*
UK	*3*
Netherlands	*3*
China	*2*
Poland	*2*
Italy	*2*

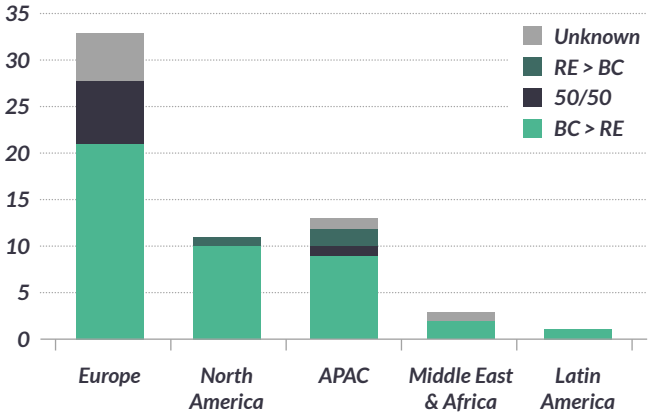
Building Technologies

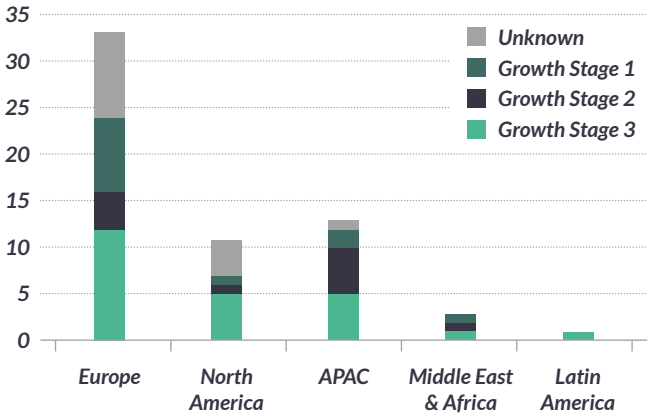
Key Facts:

- ***Number of products: 61***
- ***Average score spider diagram country pages: 1,94***

The third category is Building Technologies. In this category more technology-focussed products can be found, like blockchain infrastructure for integrators and vendors or providing specific software for real estate organizations. These solutions are again being offered for different clusters in the industry chain. We see for example products focussing on land title registry, BIM-integration, property or facility management or smart cities. The value blockchain brings for their clients and users is cost reduction,decentralization (removal of silos/ data monopolies),reduced disputes,speed through automation,transparency,trust and reduced risk through immutability, according to the participants in the in depth-survey.

Entry Point & Growth Stages





When looking at the spread of these products throughout the world, Europe is the clear leading continent. On a decent distance followed by Asia & Pacific and North-America. In the other continents hardly any product in this category exists. A large majority of all products are initiated by blockchain-organisation. There are almost no initiatives from the real estate market itself. This is not that much reflected in the market adoption. Market adoption is happening at a moderate level, perhaps because most suppliers focus on specifically selected types of real estate organisations. Examples of product providers that have outgrown the start-up stage. The USA, China, Germany and Austria are the countries with the most products that have reached FIBREE growth stage 3.

Top-4 Leading Countries	*Already in use at >3 external market players*
USA	*4*
China	*3*
Germany	*3*
Austria	*2*

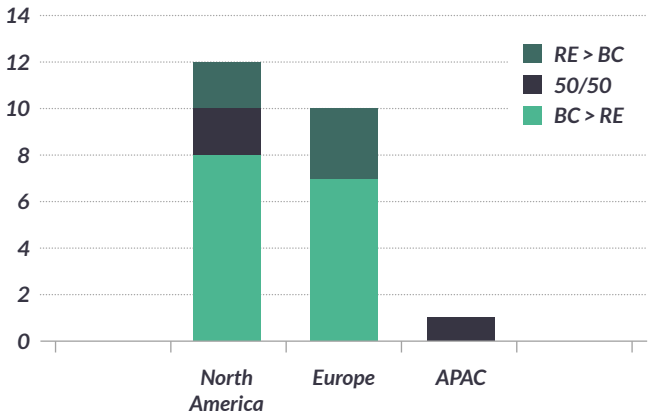
Manage & Operate

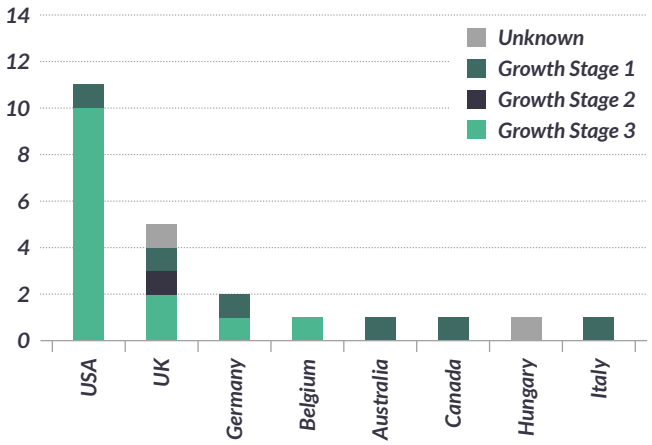
Key Facts:

- **Number of products: 23**
- **Average score spider diagram country pages: 1,78**

Manage and Operate is a category that mostly is initiated by blockchain-developers. They often focus on creating solutions for large real estate investors and asset managers. Apart from one product in Australia, initiatives are only found in North-America and Europe. Participants at the in depth-survey indicate that they have only used their own sources to fund the development of their product. Regulatory constraints, funding, technical hurdles and education are mentioned as the biggest challenges. Although it seems products have a hard road towards their markets, almost half of all initiatives in the world seem to have reached growth stage 3. The USA is clearly the leading country in the world for this category, half of all products in this category are initiated in this country of which 10 of the 14 products with growth stage 3.

Entry Point & Growth Stages





Transaction & Escrow Services

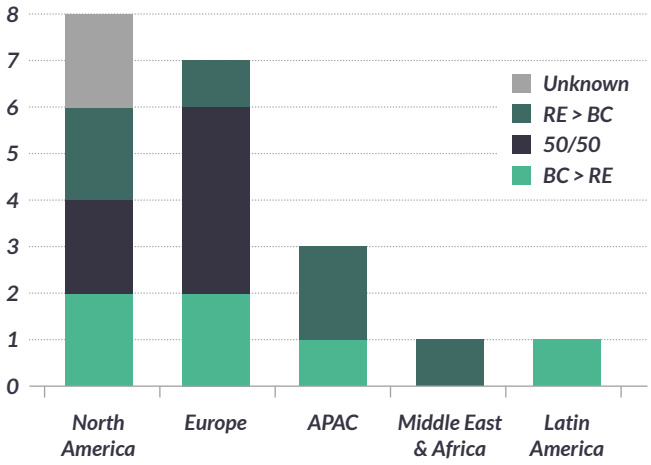
Key Facts:

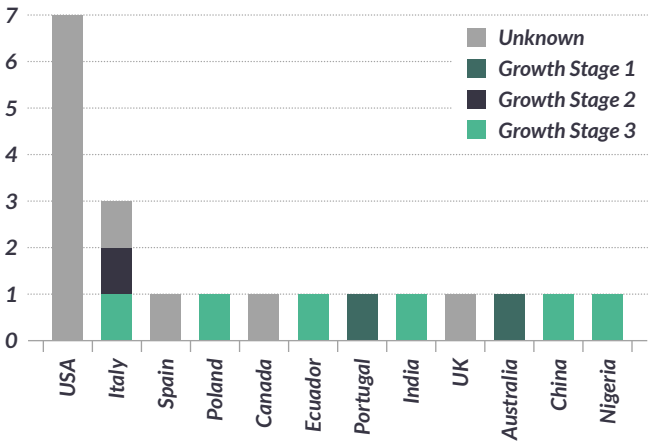
- **Number of products: 20**
- **Average score spider diagram country pages: 2,14**

This category has initially been added this year to the existing 7 categories. It stands in close relation to the segment of invest & finance and markets & platforms as product suppliers found in this field offer - mostly financial - transaction services, but different from capital market investments.

Entry Point & Growth Stages

It is somehow understood that the entry point moreover comes from the real estate sector or with the involvement of a real estate organisation, rather than from technology driven start-ups alone, as real estate transactions or investments in real estate related products have traditionally been guided by escrow agents. On a global scale this can be observed on nearly every continent that new solutions originate out of more than 50 % real estate related businesses.





An assumption which could be made is that looking at the growth stages we only see a few product suppliers being at FIBREE growth stage 3 and the vast majority of the countries in question are not clearly defined, thus maybe are still trying to understand the underlying new business models emerging around the new technology of blockchain. Especially products which we discovered in the USA could be an indication of early stage start-ups. As already stated at the beginning of this section, it is the first time we are researching this category because there is a fast growing number of products allowing to create it apart from the already existing categories. For the moment there still a lot to be researched in this category, we expect to provide more insights in next year's industry report.

Research & Valuate

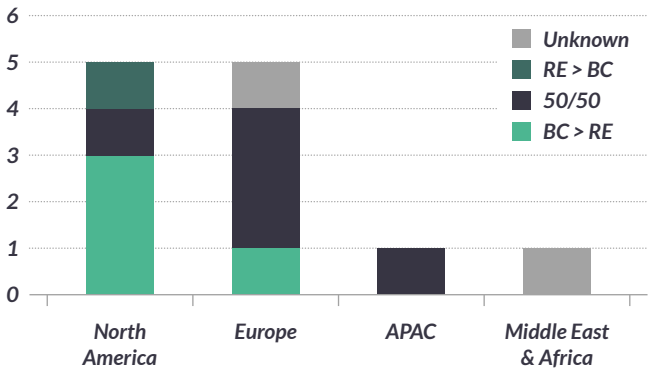
Key Facts:

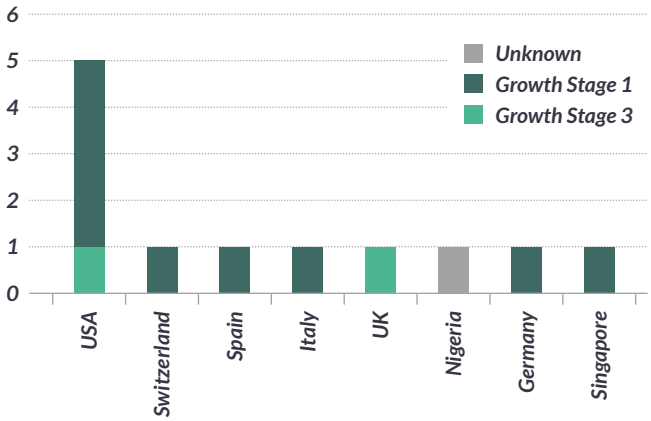
- ***Number of products:*** *12*
- ***Average score spider diagram country pages:*** *2,38*

Data driven start-ups not only play an important role in the real estate sector but in general are expected to be seen as masterminds in any industry: data is the new gold. It does not surprise that the vast majority of products with entry point out of the technological side stam from the USA. In Europe the picture shows a more equal approach as it seems the demand for services and products in this category comes from the real estate market as from tech driven start-ups.

Only a small number of product suppliers are already operating in the market offering services to more than 3 external players and originating from the USA and UK. The majority of product suppliers in this segment are still under development and mainly coming from countries in Europe. Interestingly the expectations of the FIBREE's local representatives are higher in this field compared with the products available on the global market. This could show that the demand for real estate data is strong but can not be covered yet.

Entry Point & Growth Stages





Plan & Build

Key Facts:

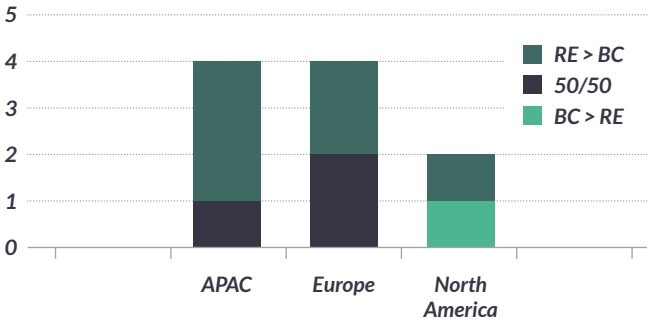
- **Number of products: 10**
- **Average score spider diagram country pages: 1,69**

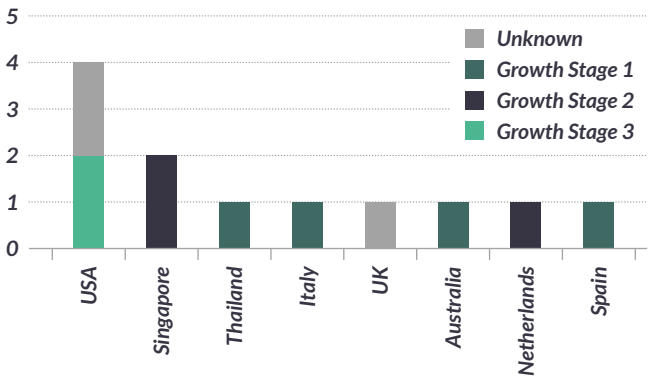
Construction seems a very traditional business and maybe digitization hardly finds entry points, as globally only 10 product suppliers are thinking of new solutions for this particular segment, which by all means plays an very important role in the value chain of the real estate life cycle.

Especially in the Asia & Pacific region start-ups emerging out of the real estate market are trying new approaches toward the field of construction or partner up with tech driven companies as observed in Europe too. Only in North America a small percentage originates out of the field of blockchain technology to offer new solutions.

The vast majority of product suppliers are still under development or working on a prototype. First market entries could be discovered in Singapore and The Netherlands.

Entry Point & Growth Stages





Smart City Solutions

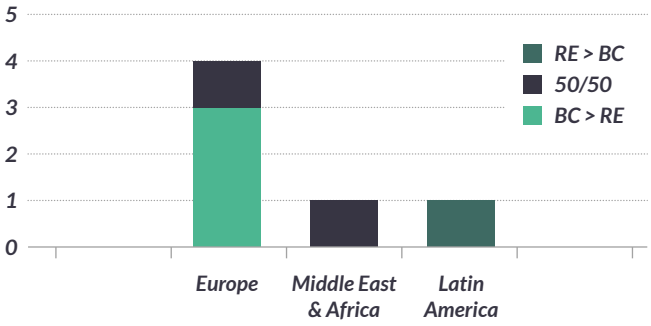
Key Facts:

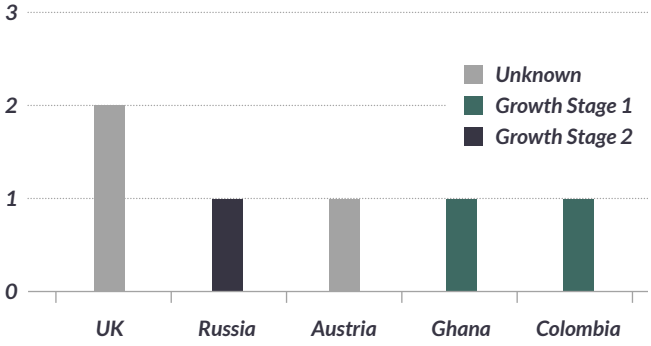
- **Number of products: 6**
- **Average score spider diagram country pages: 2,16**

The field and segment of smart city solutions is the smallest group of product suppliers being researched by the working-group. More than 50 % are developing solutions with a strong technological background and those are prominently represented in Europe. Only one product originates directly from the real estate market and can be found in South America.

Looking at the FIBREE growth stages we assume due to the fact that smart city solutions are closely related to political impact we on the one hand see so little initiatives and secondly those who started something are still at the very beginning.

Entry Point & Growth Stages





Featured Companies

FIBREE is not only a network of experts but also a network of innovative startups. Next to the support we receive from our corporate sponsors it is also of crucial importance to us to have a close link to the international startup scene. FIBREE provides access to the global market to all startups who can use our platform to feature their business; in return, their features support FIBREE to have a global presence. This mutual support is what defines FIBREE and we are very glad to present these companies in the FIBREE Industry Report 2021.

Blocksquare

blocksquare.io

Structuring and digitizing real estate is about strategy, not financing. Our tokenization protocol increases value and liquidity of real estate assets in your portfolio, while our customizable white-label platform allows you to easily manage the lifecycle of tokenized real estate properties.

***CEO** Denis Petrovcic*

Blocksquare d.o.o.

Tržaska cesta 118
1000 Ljubljana, Slovenia

future@blocksquare.io

Element36

element36.io

We accompany companies into the world of decentralized financing - from idea to go-live and beyond. Our products offer the worldwide unique possibility to interact directly with Blockchain via e-Banking - without any crypto know-how.

***CEO** Walter Strametz*

Element36 Ag

Bahnmatt 25
CH 6340 Baar

ask@element36.io

MountX

mountx.io

Creating the next generation of digital financial products to enable access to International Real Estate Investing to 140 million mill-ennials in LATAM. Tokenization powered by Blockchain is allowing investors at any scale to participate in fractionalized real estate opportunities. Tokenized assets will help provide greater liquidity, better price discovery, faster and cheaper transactions with more transparency, and global accessibility. Be part of the Digital Real Estate Future!!!

***CEO** Enrique Suarez*

MountX Real Estate Capital S.A.P.I. de C.V.

Av. Magnocentro No. 5-102
Huixquilucan, 52786, Mexico

team@mountx.io

SOLIDBLOCK

solidblock.co

SolidBlock transforms real estate into a financial product that can be traded, using blockchain to establish the asset's financial history, increase its liquidity and ensure optimal growth of the base asset via our data-driven platform.

CEO *Yuval Wirzberger*

SolidBlock Ltd.

500B Grand St., Suite 6E,
NY, New York 10002, United States

info@solidblock.co

Suscribo

suscribo.com

SUSCRIBO-Contratos Digitales markets contracting and electronic signature solutions with smart contract technology. The solutions offered by SUSCRIBO are developed by global leaders in contractual flows and management of obligations; they are the missing link to integrate the content of contracts with the systems and applications in use by companies leading the digital transformation.

CEO *Jaime Antonio Rumbea Dueñas*

Suscribo

Calle Fernán Sánchez y Av. Los Arcos
Edif. SBC Office Center
Piso 1 Officina 9

info@suscribo.com

Ubitquity

ubitquity.io

Ubitquity offers a simple user experience for securely recording and tracking property with our Blockchain-as-a-Service (BaaS) blockchain platform, ecosystem, and API called unanimity℠.

CEO *Nathan D. Wosnack*

Ubitquity, LLC

300 Delaware Avenue, Suite 210-A
/ Wilmington, Delaware, USA,
19801

info@ubitquity.io

Global Network

As of June 2021 FIBREE is represented in 40 countries at 81 locations with 119 active regional chairs. The data for the following country reports have been aggregated by the regional chairs of the specific country based on their knowledge of the industry. This data does not claim to be complete or accurate, but is intended to provide an indication of the current state of the industry.


Denmark
Germany
Finland
Luxembourg
Netherlands
Austria
UK
Poland
Ireland
Belgium
Hungary
France
Greece
Spain
Georgia
Russia
India
China
Portugal
Malta
Saudi Arabia
Switzerland
Italy
Croatia
Slovenia
Israel
Turkey
United Arab Emirates
Nigeria
Singapore
Uganda
Kenya
Australia

Argentina

Country Map

Find your local chapter

Regional Chairs

Buenos Aires
Damian Lopo damian.lopo@fibree.org
Néstor Kreimer nestor.kreimer@fibree.org

Country Facts

Source: Wikipedia

Buenos Aires
Capital

44,938,712
Population

Argentine Peso
Currency

Spanish
Language

$444.458 billion
GDP

FIBREE Facts

November 2020
First chapter

< 100
Size of community

2
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Binance Smart Chain (BSC)**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Open, but not there yet**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

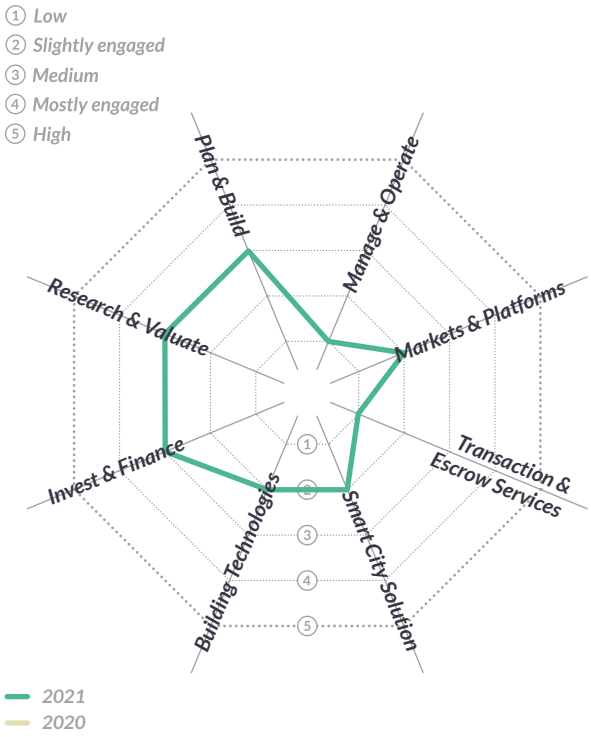
» **31**

Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

-

Level of Engagement with Blockchain in Defined Segments



Sector Activity

Product Database Keyfigures

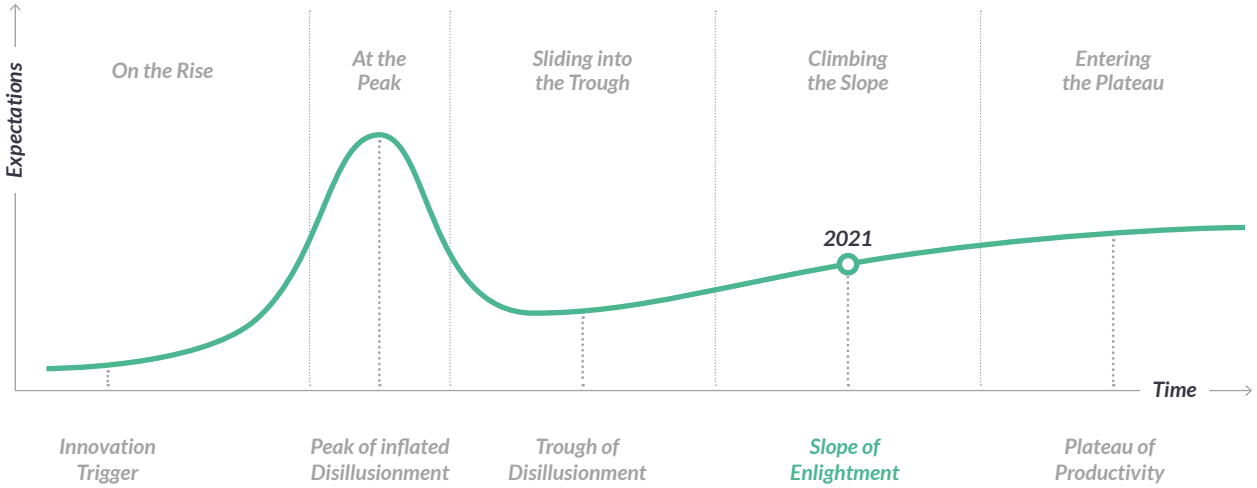
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	-	1	4
Global ranking	-	#33	#17

Product Database by Segment

Active products 2021 and change directions since 2020.

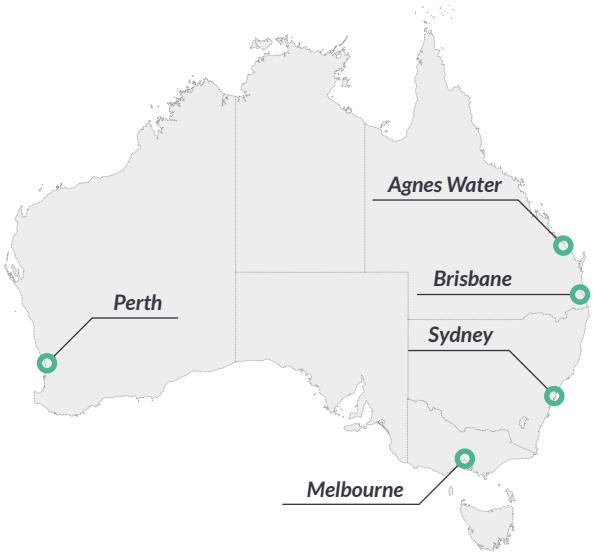
Gartner Hype Cycle



Australia

Country Map

Find your local chapter



Regional Chairs

- **Agnes Water**
  Gordon Christian gordon.christian@fibree.org
- **Brisbane**
  Lindy Chen lindy.chen@fibree.org
- **Melbourne**
  Ikram Akbar ikram.akbar@fibree.org
  John Bassilios john.bassilios@fibree.org
- **Perth**
  Chris Dorian chris.dorian@fibree.org
  Julia Buchholz julia.buchholz@fibree.org
- **Sydney**
  Alan McNamara alan.mcnamara@fibree.org
  Bradley C. Hughes bradley.hughes@fibree.org

Country Facts

Source: Wikipedia

Canberra
Capital

25,810,000
Population

Australian Dollar
Currency

English
Language

$1.618 trillion
GDP

FIBREE Facts

December 2018
First chapter

>1000
Size of community

8
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» *Hyperledger*

Readiness by Financial Authorities to Accept Blockchain Applications

» *Open, but not there yet*

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

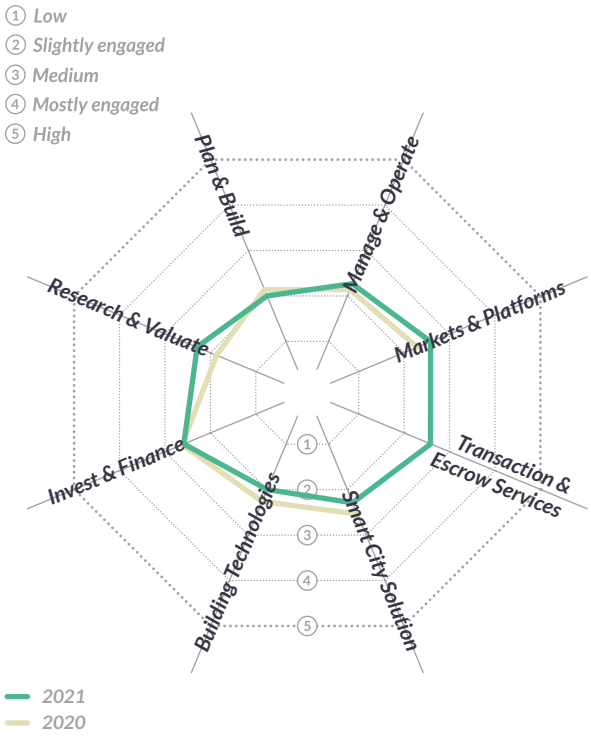
» *158*

Research on Blockchain and Real Estate

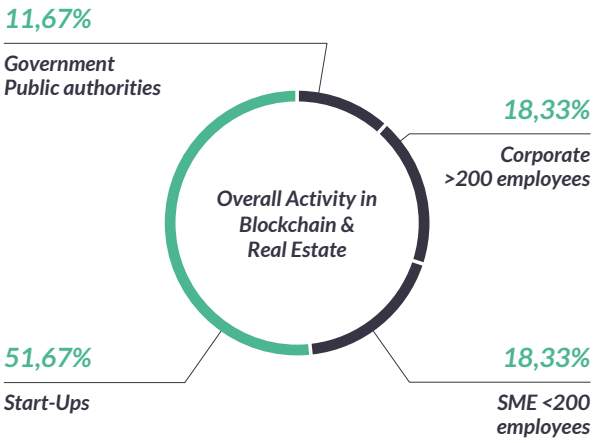
Universities and education programs in the field of blockchain and real estate.

University of New South Wales, Australia Blockchain Alliance, RMIT, Monash University

Level of Engagement with Blockchain in Defined Segments



Sector Activity



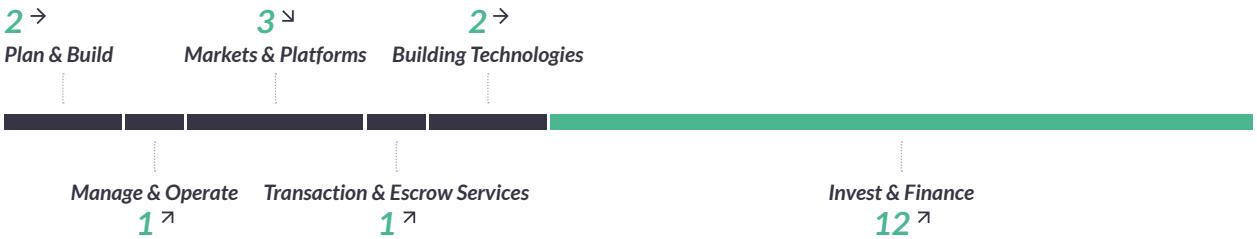
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

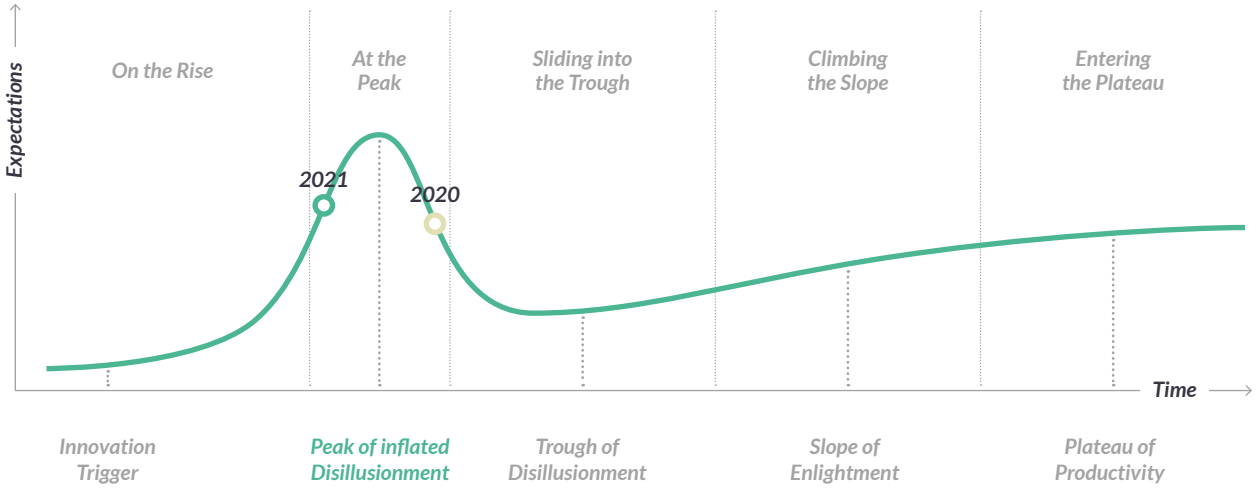
	2019	2020	2021
Number of products	19	15	21
Global ranking	#7	#5	#3

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Austria

Country Map

Find your local chapter

Regional Chairs

- **Vienna**
  Dominik Alphart dominik.alphart@fibree.org
  Florian Huber florian.huber@fibree.org
- **Graz**
  Marco Neumayer marco.neumayer@fibree.org

Country Facts

Source: Wikipedia

Vienna
Capital

8,935,112
Population

Euro
Currency

German
Language

$446,315 billion
GDP

FIBREE Facts

July 2018
First chapter

< 500
Size of community

3
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Yes**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

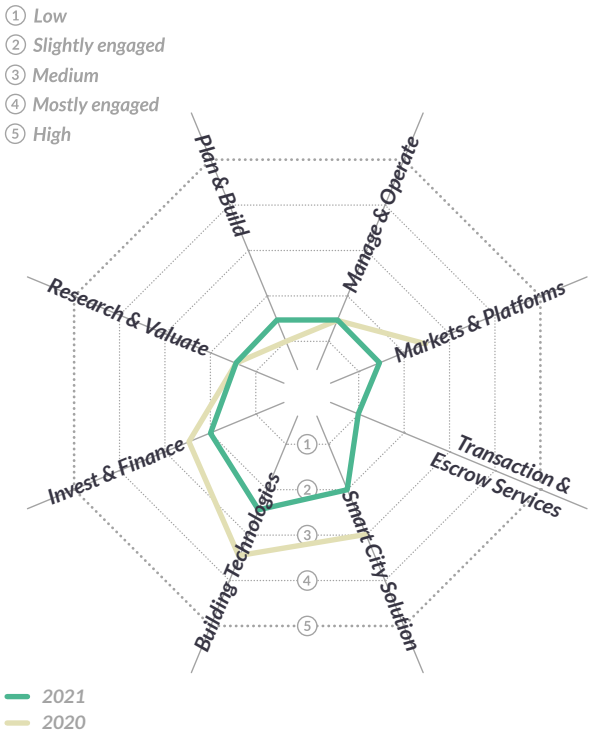
» **117**

Research on Blockchain and Real Estate

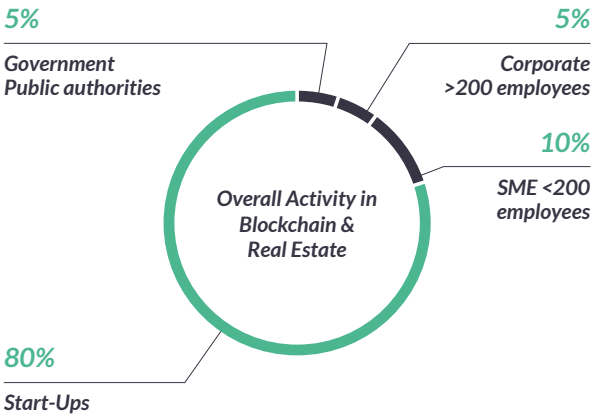
Universities and education programs in the field of blockchain and real estate.

Austrian Blockchain Center, FH Wien, University for Econcomics and Business Administration Vienna

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

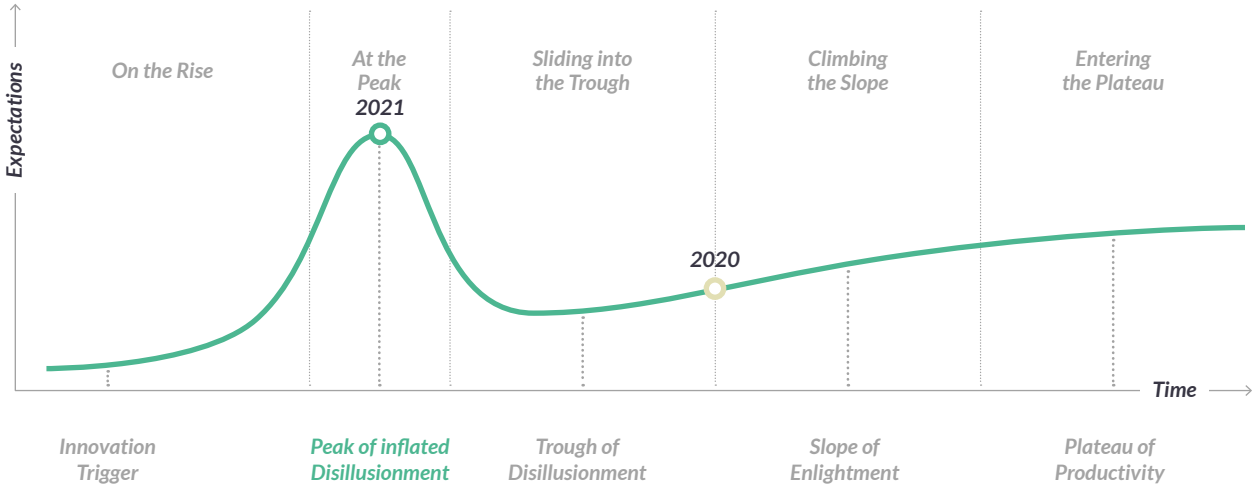
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	4	4	8
Global ranking	#16	#13	#13

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Belgium

Country Map

Find your local chapter

Regional Chairs

Brussels
Alexander Appelmans *alexander.appelmans@fibree.org*

Country Facts

Source: Wikipedia

Brussels
Capital

11,492,641
Population

Euro
Currency

Dutch, French, German
Language

$503,416 billion
GDP

FIBREE Facts

March 2019
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

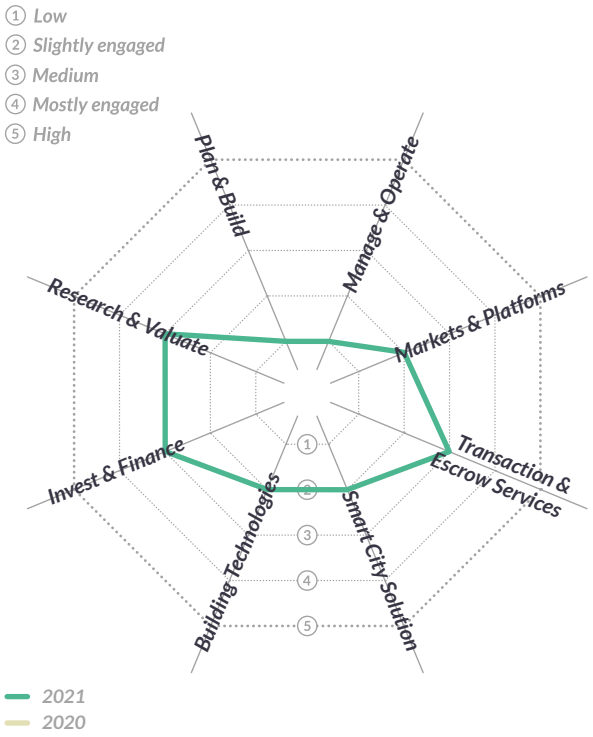
» ***129***

Research on Blockchain and Real Estate

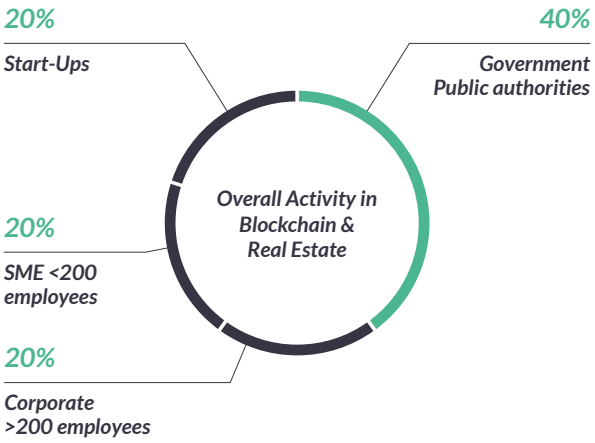
Universities and education programs in the field of blockchain and real estate.

KU Leuven

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

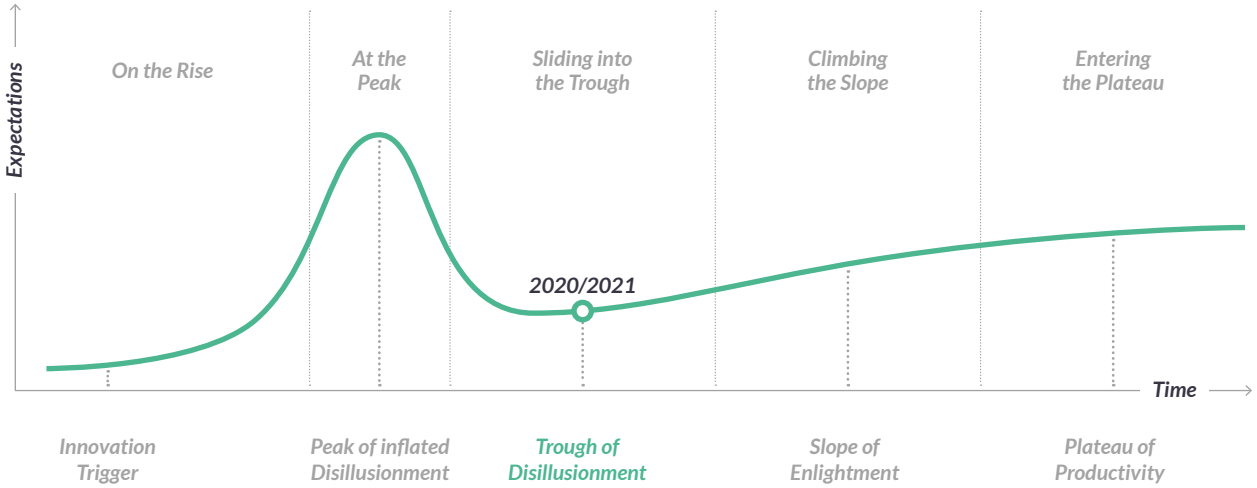
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	2	5	3
Global ranking	#34	#12	#23

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Brazil

Country Map

Find your local chapter

Regional Chairs

São Paulo
Rafael Stocco *rafael.stocco@fibree.org*
Rubens Neistein *rubens.neistein@fibree.org*

Country Facts

Source: Wikipedia

Brasília
Capital

210,147,125
Population

Real
Currency

Portuguese
Language

$1.491 trillion
GDP

FIBREE Facts

November 2018
First chapter

< 500
Size of community

2
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum, Hyperledger***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

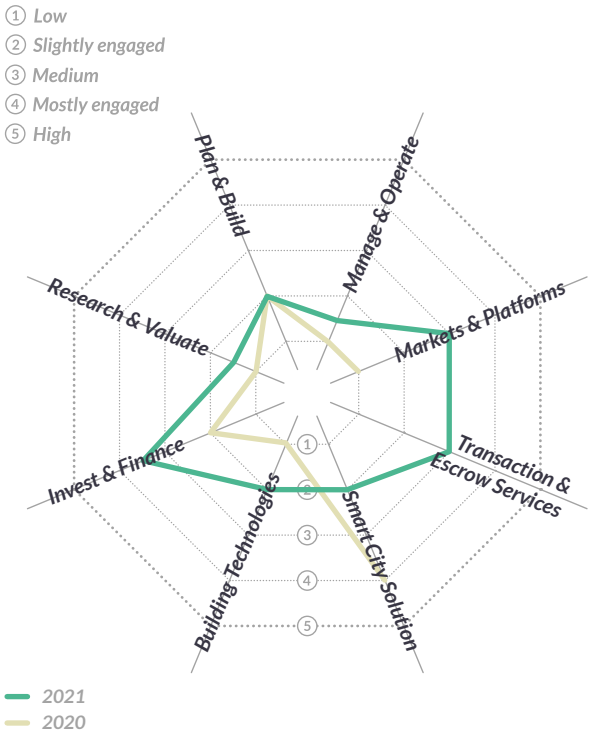
» ***48***

Research on Blockchain and Real Estate

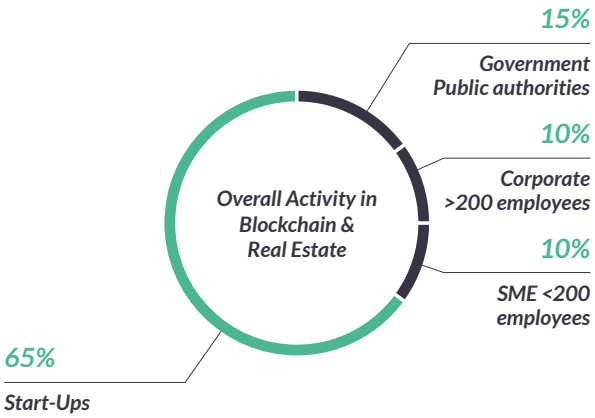
Universities and education programs in the field of blockchain and real estate.

USP Universidade de São Paulo / UNICAMP, FIAP

Level of Engagement with Blockchain in Defined Segments



Sector Activity



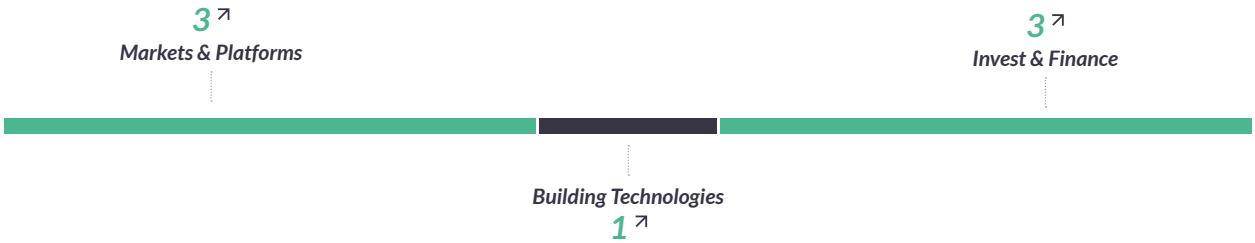
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

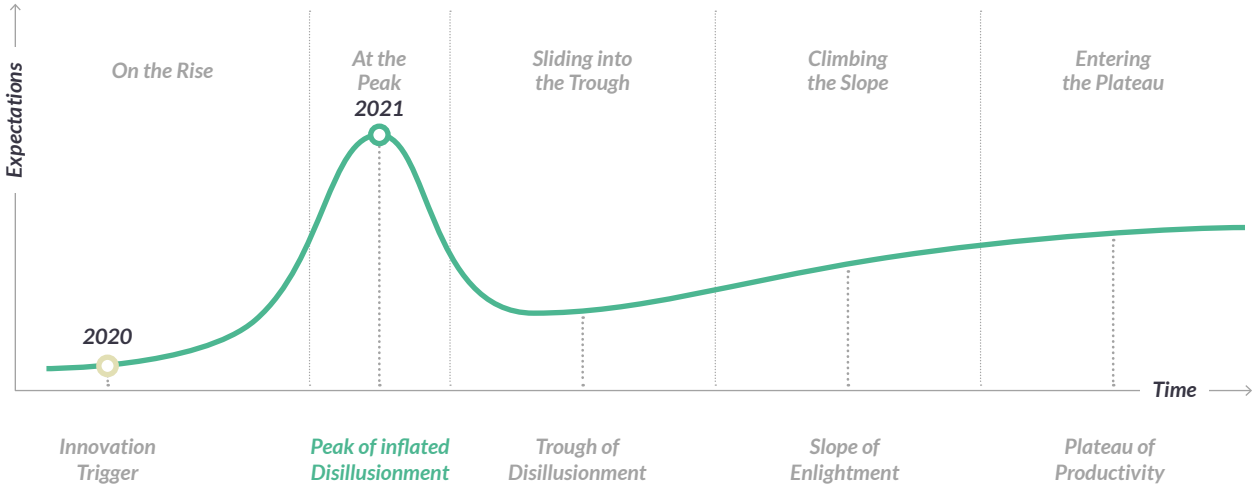
	2019	2020	2021
Number of products	1	3	7
Global ranking	#41	#17	#15

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Canada

Country Map

Find your local chapter

Regional Chairs

- **Toronto**
  Nathan Wosnack *nathan.wosnack@fibree.org*
- **Vancouver**
  Kazim Kargi *kazim.kargi@fibree.org*

Country Facts

Source: Wikipedia

Ottawa
Capital

38,048,738
Population

Canadian Dollar
Currency

English, French
Language

$1.883 trillion
GDP

FIBREE Facts

March 2019
First chapter

< 50
Size of community

2
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Yes**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

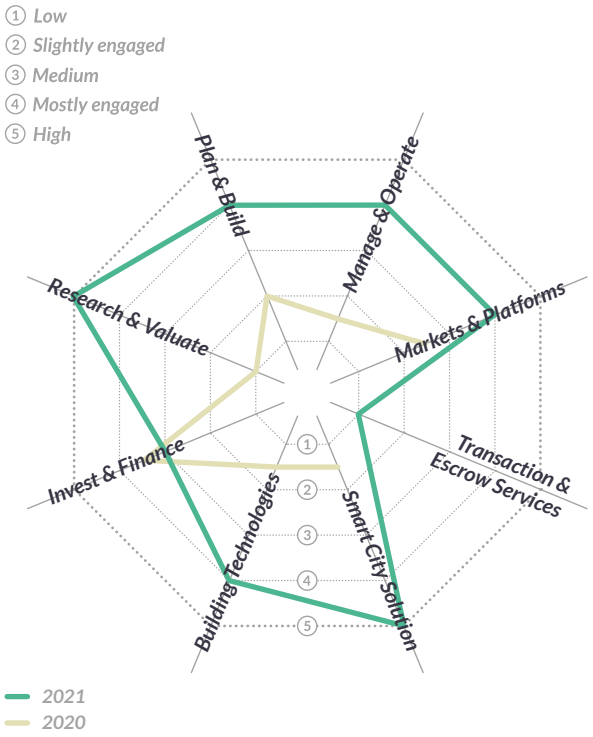
» **446**

Research on Blockchain and Real Estate

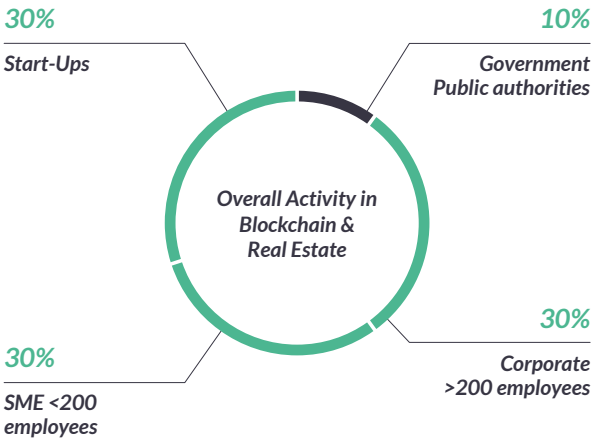
Universities and education programs in the field of blockchain and real estate.

University of Toronto, George Brown, Toronto School of Management, Ryerson

Level of Engagement with Blockchain in Defined Segments



Sector Activity



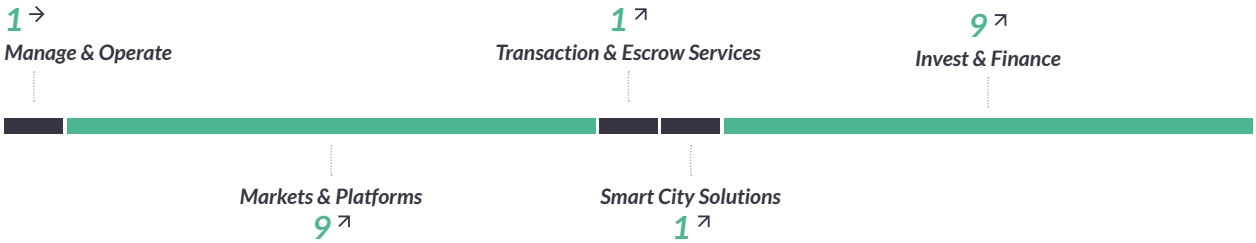
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

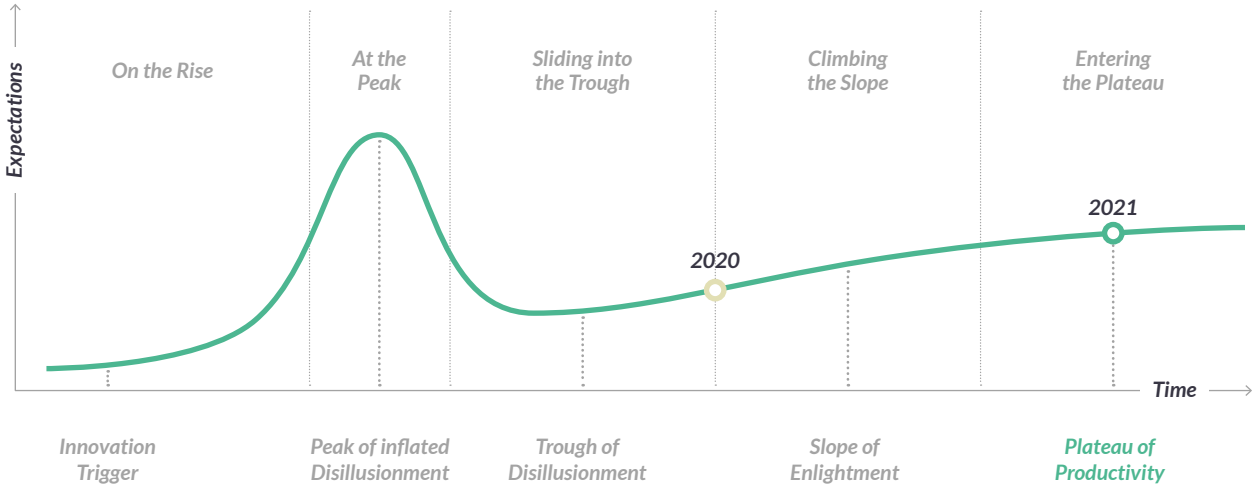
	2019	2020	2021
Number of products	14	14	21
Global ranking	#11	#6	#3

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Country Map

Find your local chapter

Regional Chairs

- ***Qingdao***
  Brian Suin *brian.suin@fibree.org*
- ***Shanghai***
  Albert Xuan *albert.xuan@fibree.org*

Country Facts

Source: Wikipedia

Beijing
Capital

1,444,390,177
Population

Renminbi
Currency

Standard Chinese
Language

$16.64 trillion
GDP

FIBREE Facts

March 2020
First chapter

< 100
Size of community

2
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

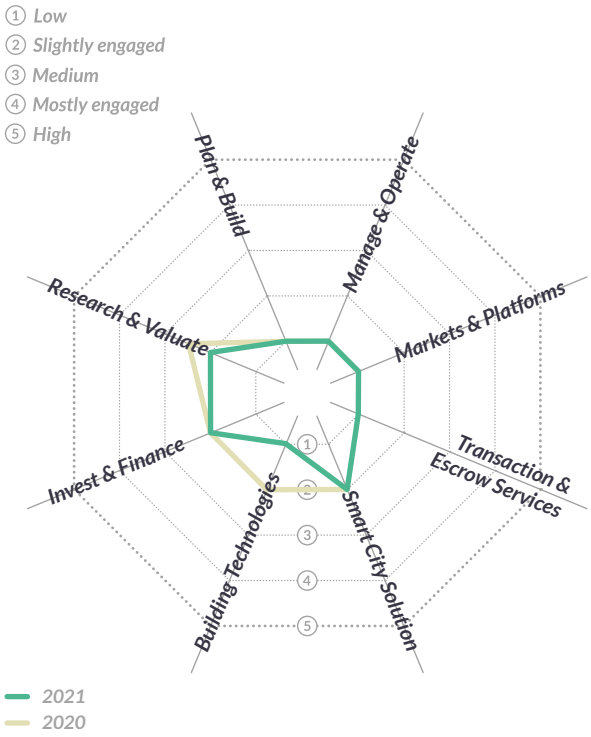
» ***109***

Research on Blockchain and Real Estate

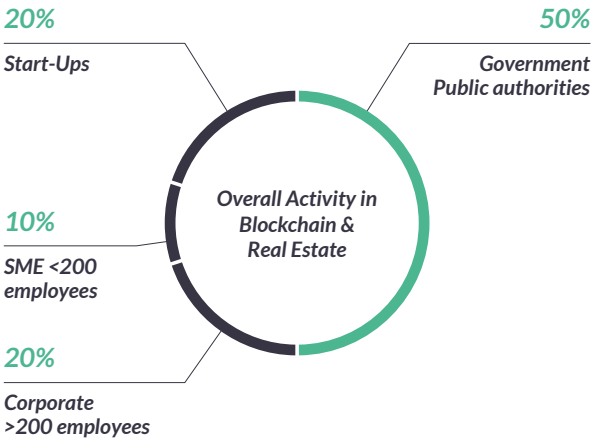
Universities and education programs in the field of blockchain and real estate.

-

Level of Engagement with Blockchain in Defined Segments



Sector Activity



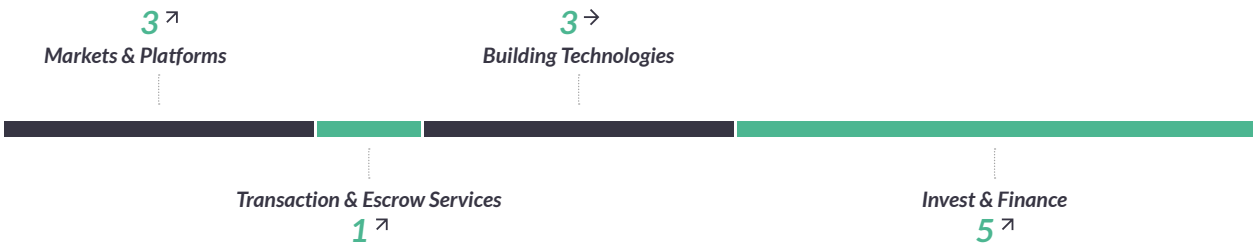
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

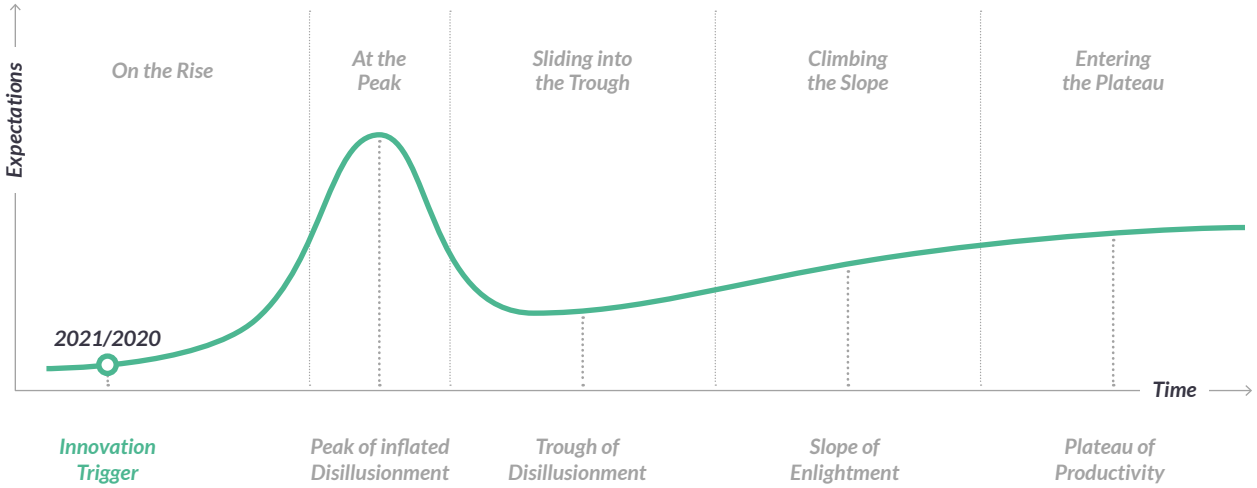
	2019	2020	2021
Number of products	7	9	12
Global ranking	#14	#9	#8

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Colombia

Country Map

Find your local chapter

Regional Chairs

Bogotá
Andrés Assmus andres.assmus@fibree.org

Country Facts

Source: Wikipedia

Bogotá
Capital

50,372,424
Population

Colombian Peso
Currency

Spanish
Language

$343.177 billion
GDP

FIBREE Facts

February 2020
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Yes**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

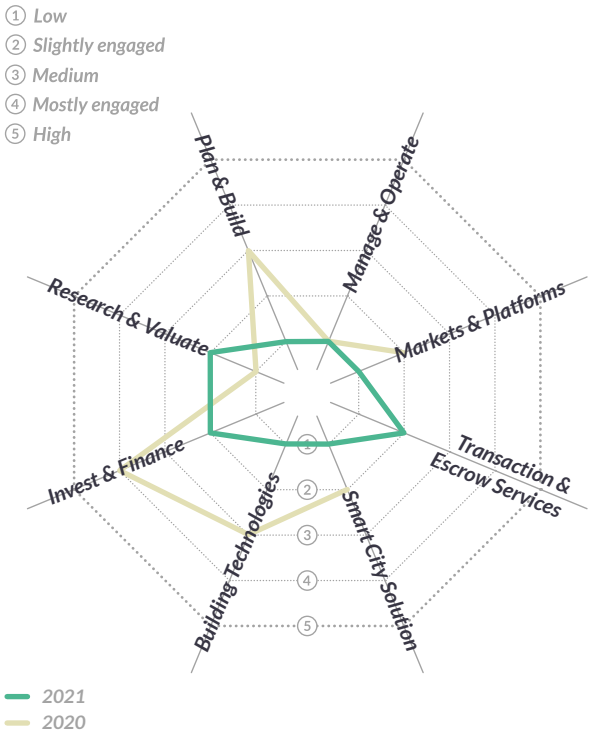
» **33**

Research on Blockchain and Real Estate

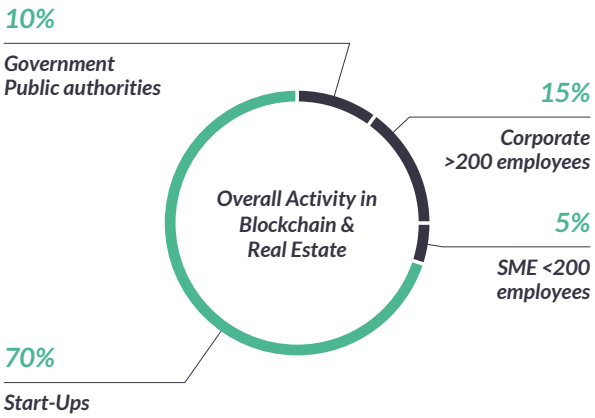
Universities and education programs in the field of blockchain and real estate.

Univ Distrital, Univ de la Sabana, Sergio Arboleda

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

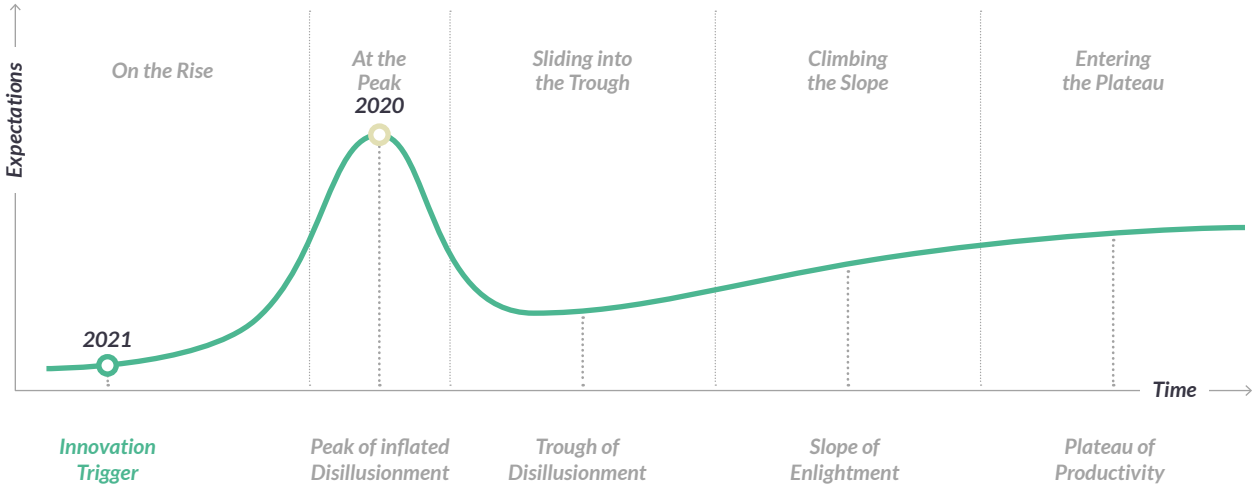
	2019	2020	2021
Number of products	3	0	0
Global ranking	#25	-	-

Product Database by Segment

Active products 2021 and change directions since 2020.

No Products

Gartner Hype Cycle



Croatia

Country Map

Find your local chapter

Regional Chairs

Zagreb
Tomica Cesar tomica.cesar@fibree.org

Country Facts

Source: Wikipedia

Zagreb
Capital

4,058,165
Population

Kuna
Currency

Croatian
Language

$63.172 billion
GDP

FIBREE Facts

July 2018
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» Ethereum

Readiness by Financial Authorities to Accept Blockchain Applications

» Open, but not there yet

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

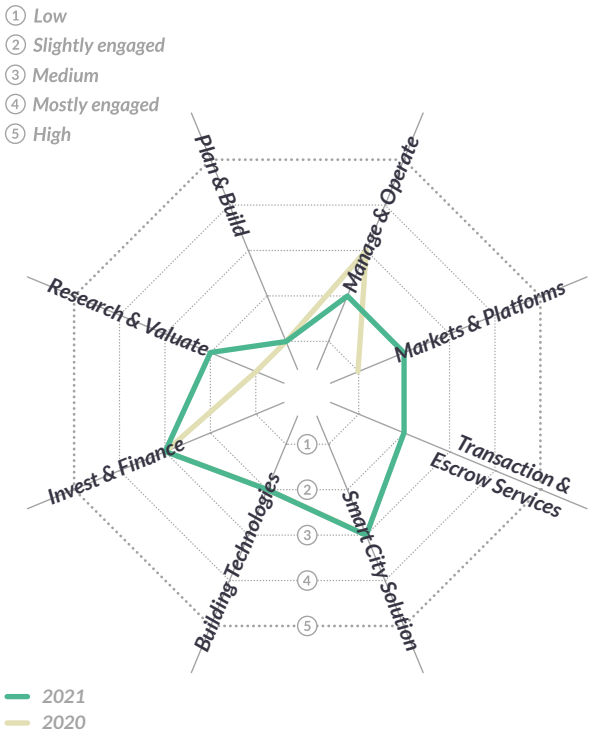
» 55

Research on Blockchain and Real Estate

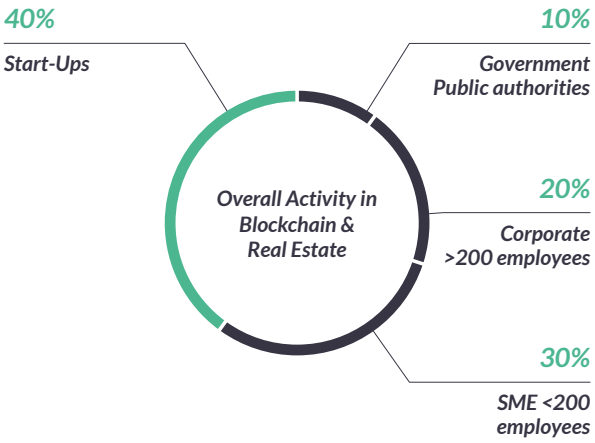
Universities and education programs in the field of blockchain and real estate.

-

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

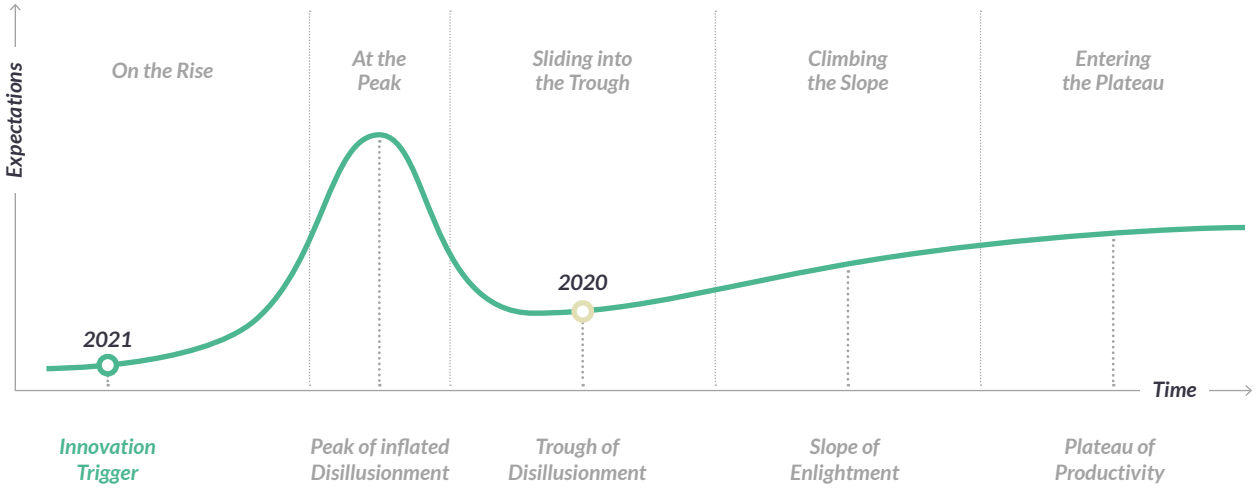
	2019	2020	2021
Number of products	1	0	0
Global ranking	#41	-	-

Product Database by Segment

Active products 2021 and change directions since 2020.

No Products

Gartner Hype Cycle



Denmark

Country Map

Find your local chapter

Regional Chairs

Copenhagen
Claus Skaaning *claus.skanning@fibree.org*

Country Facts

Source: Wikipedia

Copenhagen
Capital

5,843,347
Population

Danish Krone
Currency

Danish
Language

$370 billion
GDP

FIBREE Facts

October 2020
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	**Mostly digital**	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Yes***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» ***120***

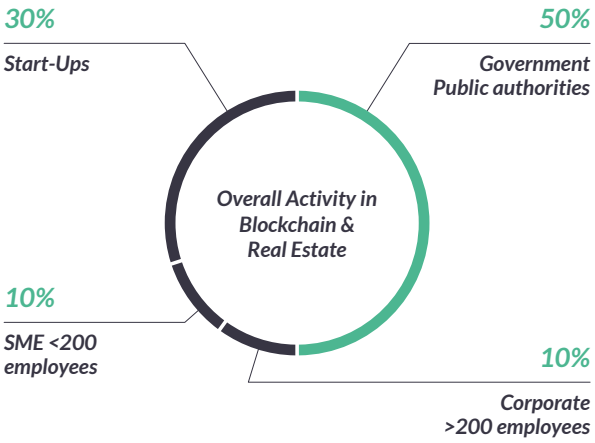
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

CBS, DTU

Level of Engagement with Blockchain in Defined Segments

Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

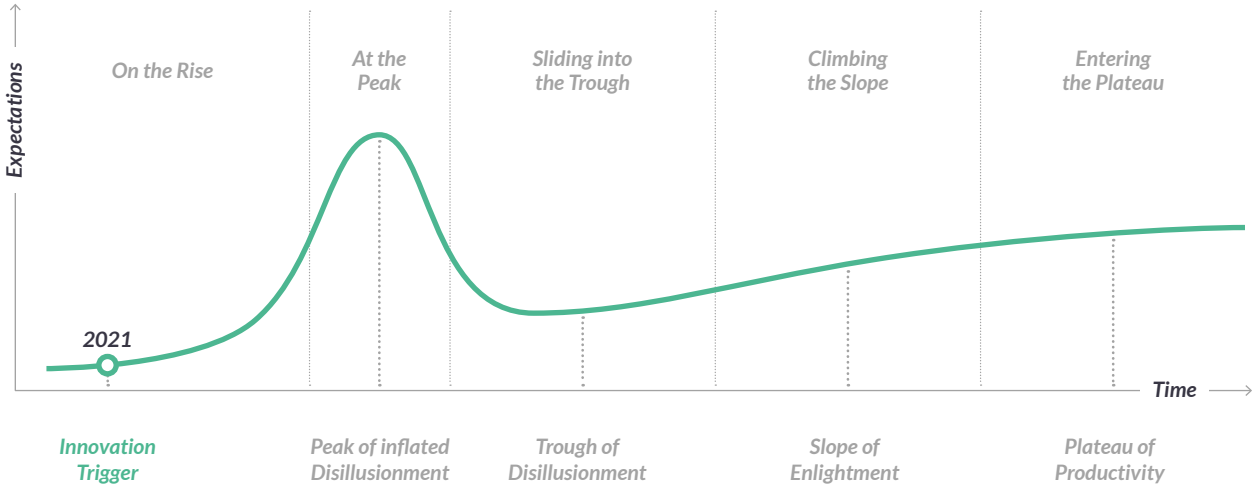
	2019	2020	2021
Number of products	0	0	1
Global ranking	-	-	#40

Product Database by Segment

Active products 2021 and change directions since 2020.

1 ↗
Invest & Finance

Gartner Hype Cycle



Ecuador

Country Map

Find your local chapter

Regional Chairs

Guayaquil
Jaime Antonio Rumbea Dueñas
jamie.antonio.rumbea@fibree.org

Country Facts

Source: Wikipedia

Quito
Capital

17,684,536
Population

United States Dollar
Currency

Spanish
Language

$106.289 billion
GDP

FIBREE Facts

March 2021
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» *Ethereum*

Readiness by Financial Authorities to Accept Blockchain Applications

» *No*

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

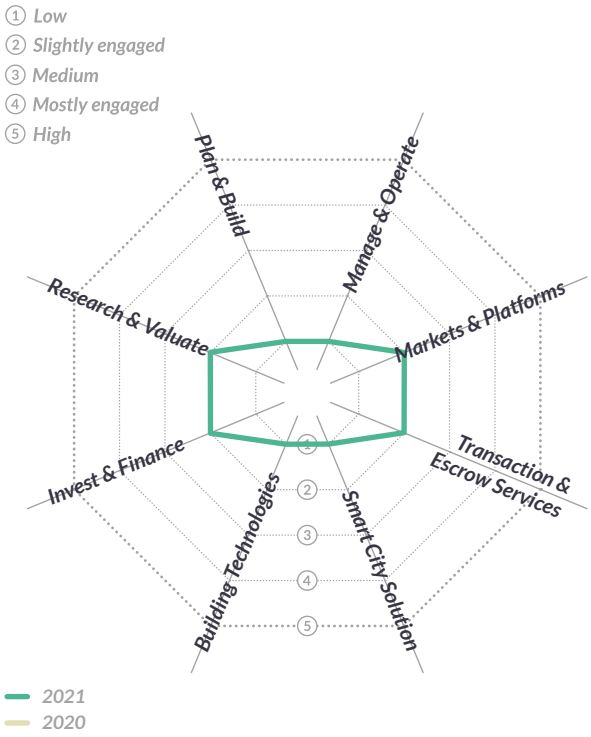
» -

Research on Blockchain and Real Estate

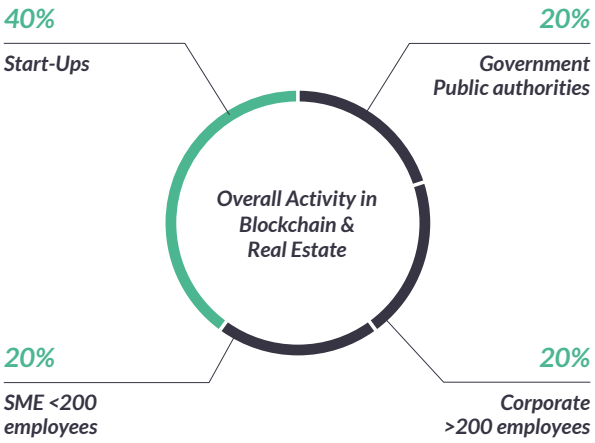
Universities and education programs in the field of blockchain and real estate.

-

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

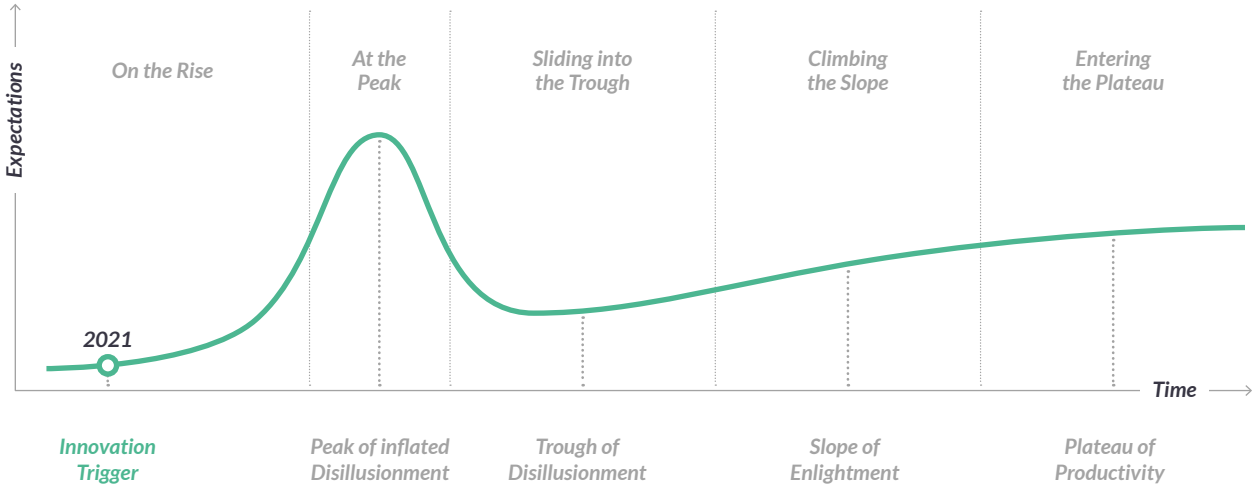
	2019	2020	2021
Number of products	0	0	1
Global ranking	-	-	#40

Product Database by Segment

Active products 2021 and change directions since 2020.

1 ↗
Transaction & Escrow Services

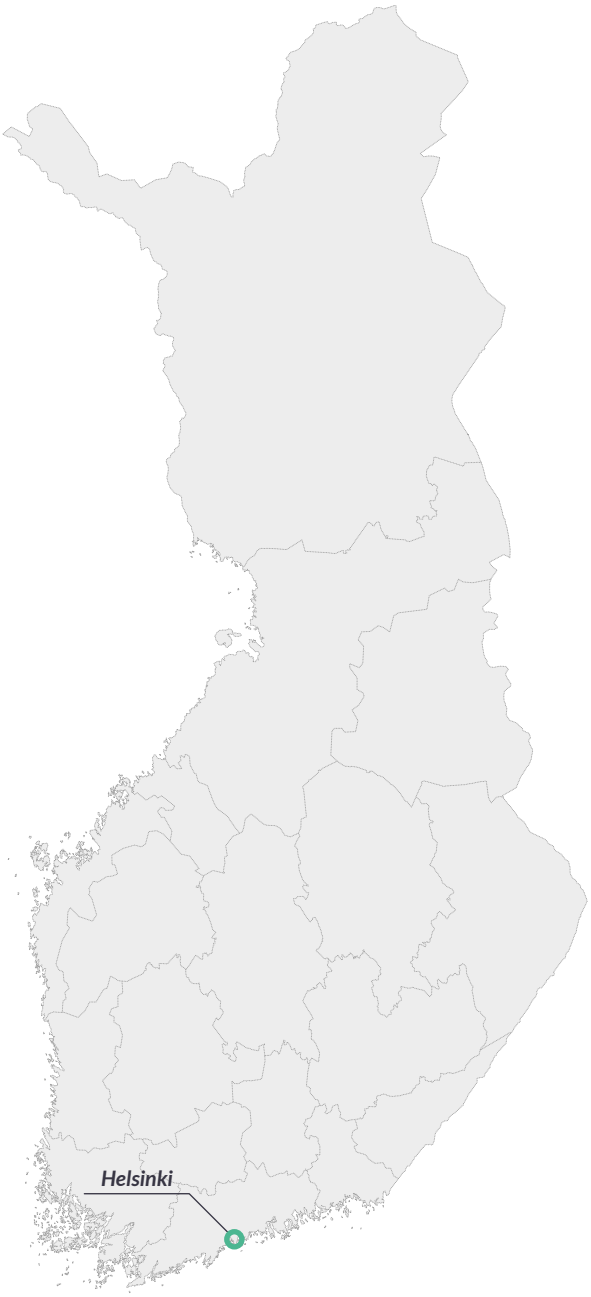
Gartner Hype Cycle



Finland

Country Map

Find your local chapter



Regional Chairs

Helsinki
Ivan Nokhrin *ivan.nokhrin@fibree.org*

Country Facts

Source: Wikipedia

Helsinki
Capital

5,536,146
Population

Euro
Currency

Finnish, Swedish
Language

$277 billion
GDP

FIBREE Facts

August 2020
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Hyperledger**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Open, but not there yet**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

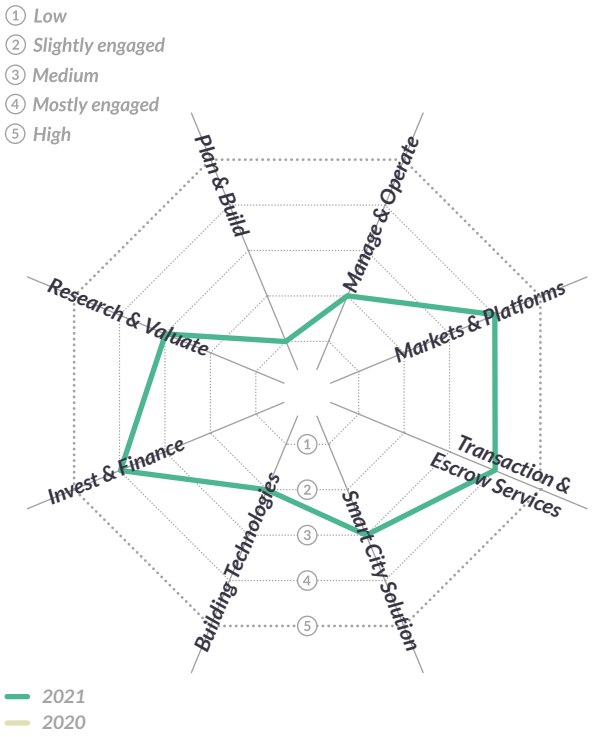
» **131**

Research on Blockchain and Real Estate

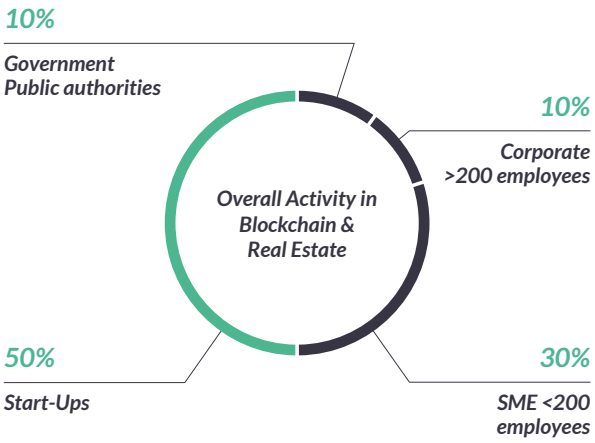
Universities and education programs in the field of blockchain and real estate.

Aalto University, Tampere University of Applied Sciences, LUT

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

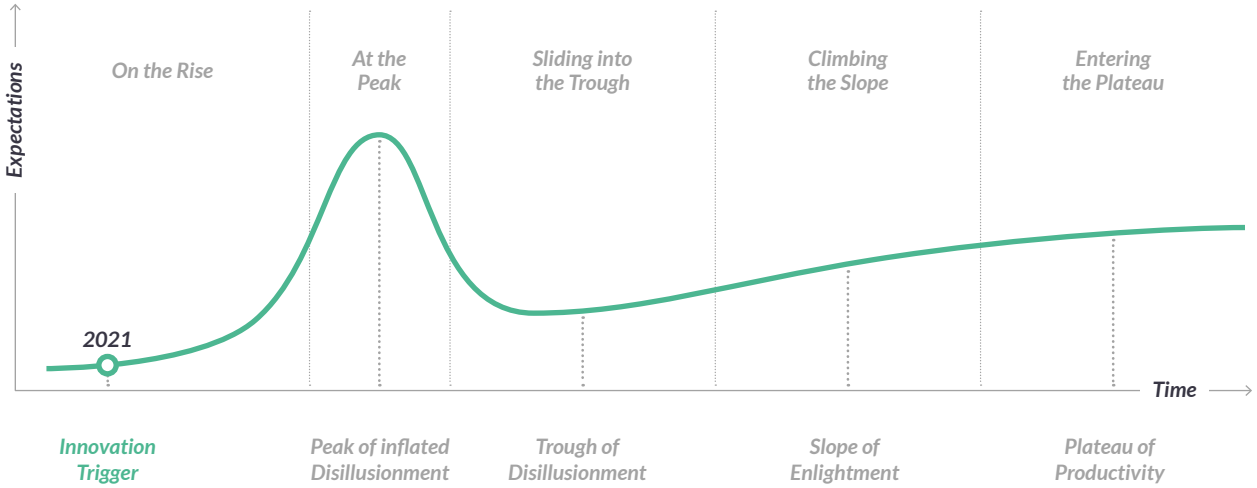
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	0	0	4
Global ranking	-	-	#17

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



France

Country Map

Find your local chapter

Regional Chairs

Paris
Grégoire d'Avout *gregoire.davout@fibree.org*

Country Facts

Source: Wikipedia

Paris
Capital

67,413,000
Population

Euro
Currency

French
Language

$2.551 trillion
GDP

FIBREE Facts

July 2020
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Tezos***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» ***420***

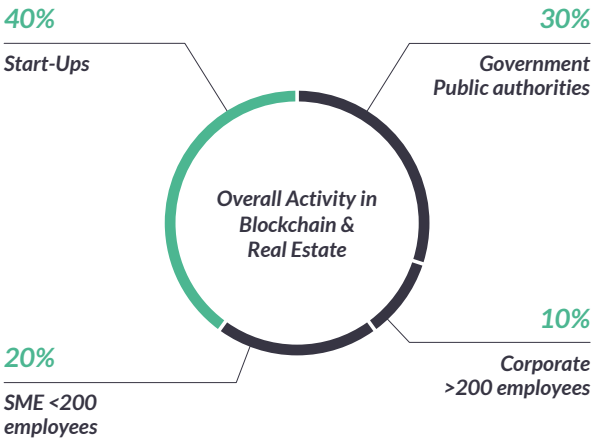
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

-

Level of Engagement with Blockchain in Defined Segments

Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

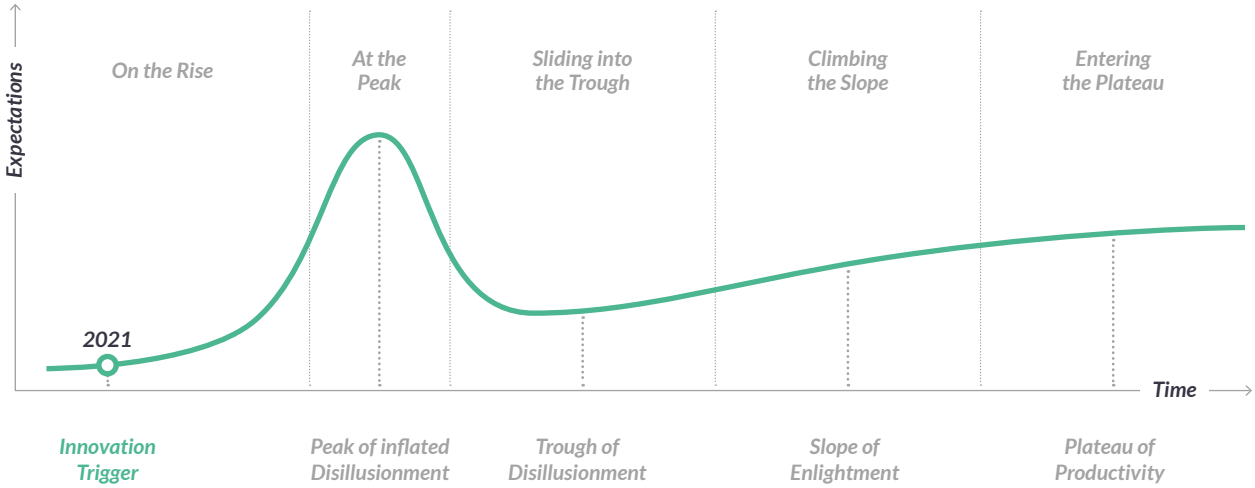
	2019	2020	2021
Number of products	9	4	1
Global ranking	#12	#13	#40

Product Database by Segment

Active products 2021 and change directions since 2020.

1 →
Markets & Platforms

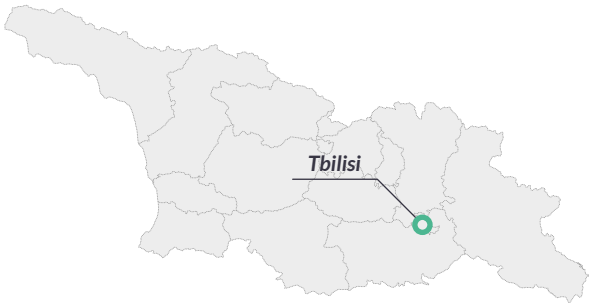
Gartner Hype Cycle



Georgia

Country Map

Find your local chapter



Regional Chairs

Tbilisi
Mariam Turashvili mariam.turashvili@fibree.org

Country Facts

Source: Wikipedia

Tbilisi
Capital

3,716,858
Population

Georgian Lari
Currency

Georgian, Abkhazian
Language

$17.83 billion
GDP

FIBREE Facts

July 2018
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» *Bitcoin*

Readiness by Financial Authorities to Accept Blockchain Applications

» -

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

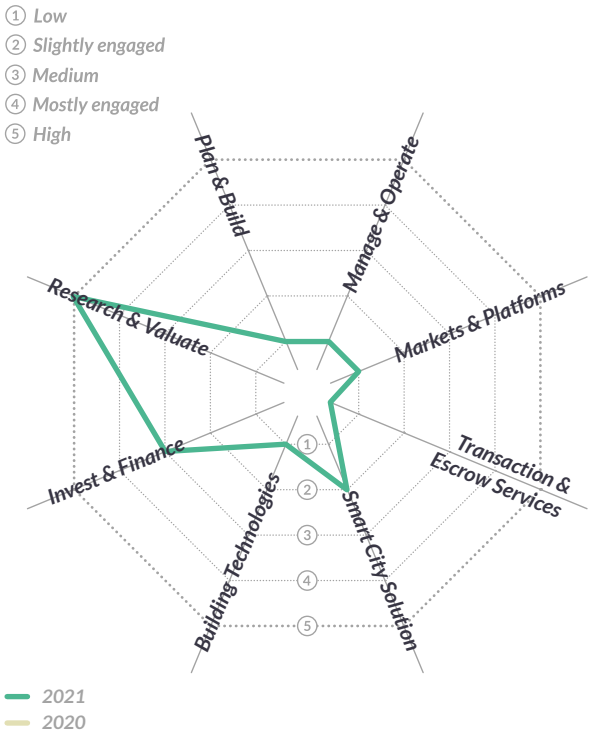
» *11*

Research on Blockchain and Real Estate

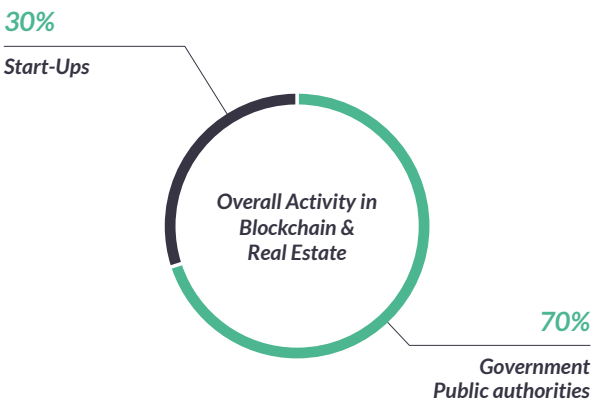
Universities and education programs in the field of blockchain and real estate.

-

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

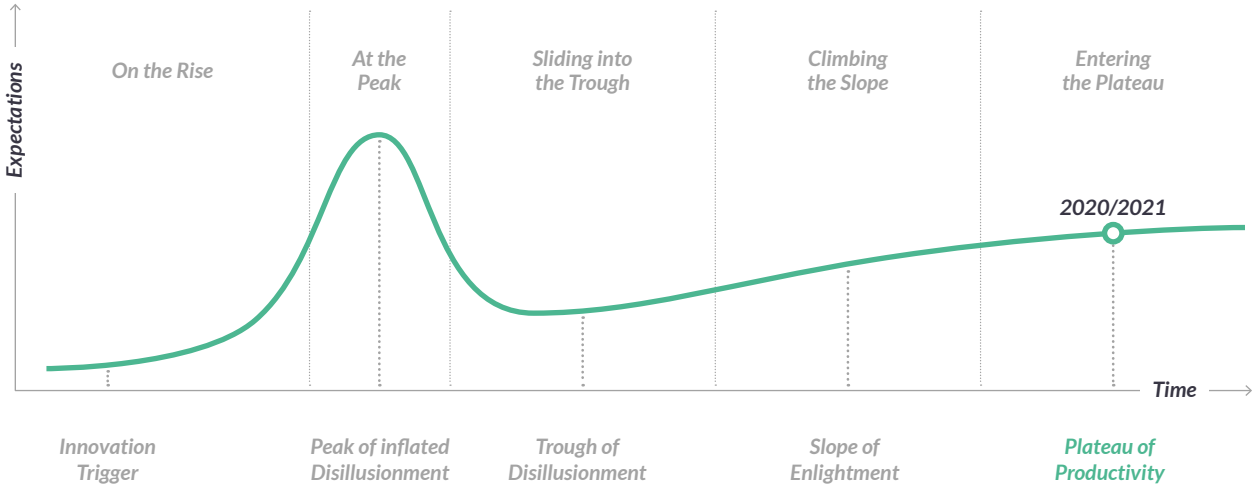
	2019	2020	2021
Number of products	14	14	21
Global ranking	#11	#6	#3

Product Database by Segment

Active products 2021 and change directions since 2020.

No Products

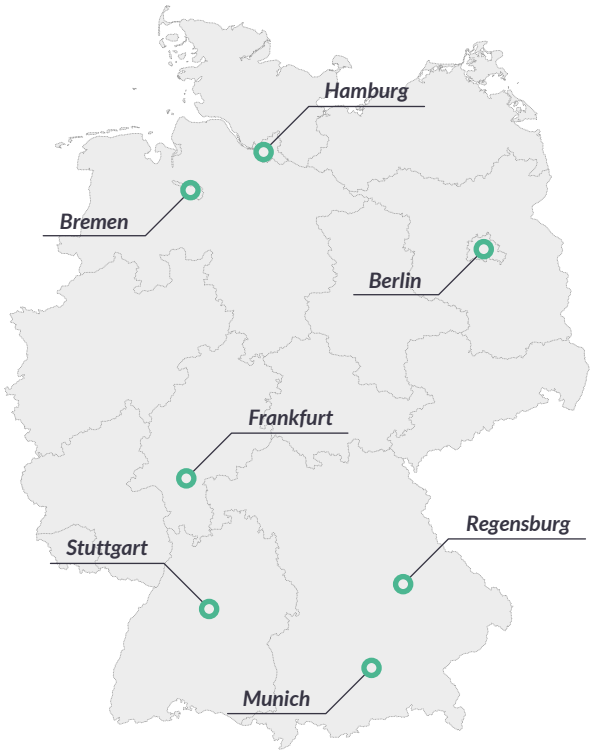
Gartner Hype Cycle



Germany

Country Map

Find your local chapter



Regional Chairs

- **Berlin**
  Achim Jedelsky achim.jedelsky@fibree.org
  Axel von Goldbeck axel.von.goldbeck@fibree.org
- **Bremen**
  Balte Jorns balte.jorns@fibree.org
- **Frankfurt**
  Roland Farhat roland.farhat@fibree.org
- **Hamburg**
  Marc Driessen marc.driessen@fibree.org
  Paul Huelsmann paul.huelsmann@fibree.org
- **Munich**
  Michael Reuter michael.reuter@fibree.org
- **Regensburg**
  Sandor Horvath sandor.horvath@fibree.org
- **Stuttgart**
  Fabian Süß fabian.suess@fibree.org
  Sebastian Steimer sebastian.steimer@fibree.org

Country Facts

Source: Wikipedia

Berlin
Capital

83,190,556
Population

Euro
Currency

German
Language

$4.319 trillion
GDP

FIBREE Facts

July 2018
First chapter

> 1000
Size of community

10
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum, IOTA, Bitcoin**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Yes**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

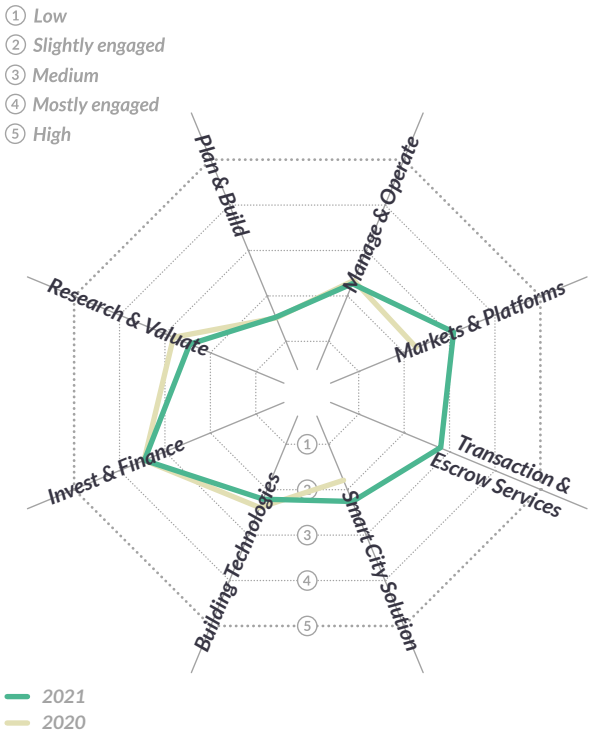
» **325**

Research on Blockchain and Real Estate

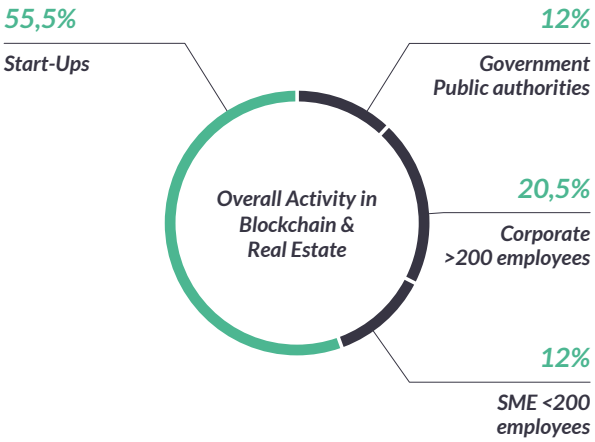
Universities and education programs in the field of blockchain and real estate.

TUM,LMU, Frankfurt School of Finance, FHTW Berlin, DHBW Stuttgart, IREBS at University of Regensburg, HSBA

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

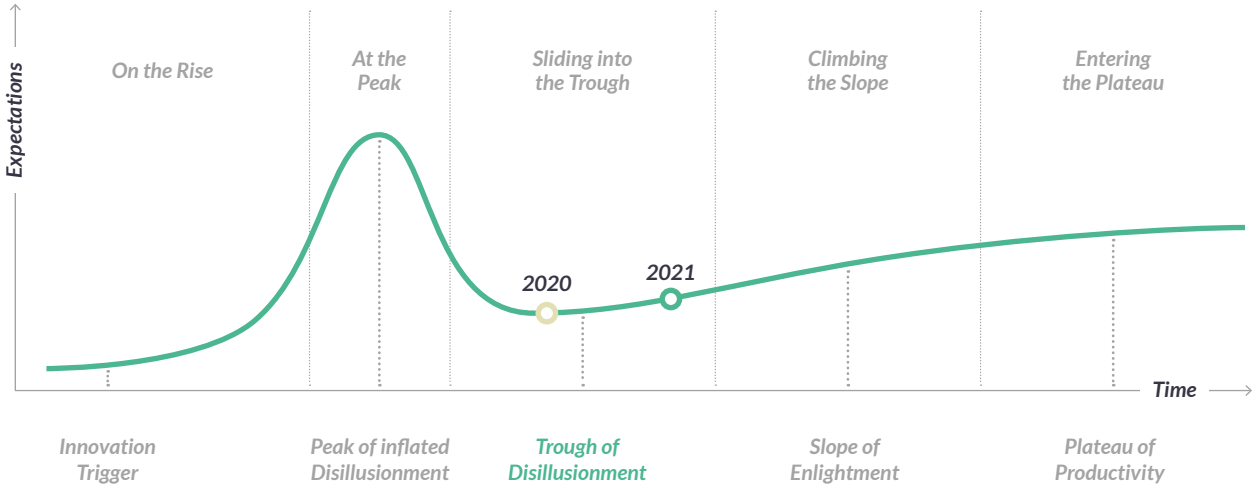
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	17	20	11
Global ranking	#8	#3	#9

Product Database by Segment

Active products 2021 and change directions since 2020.

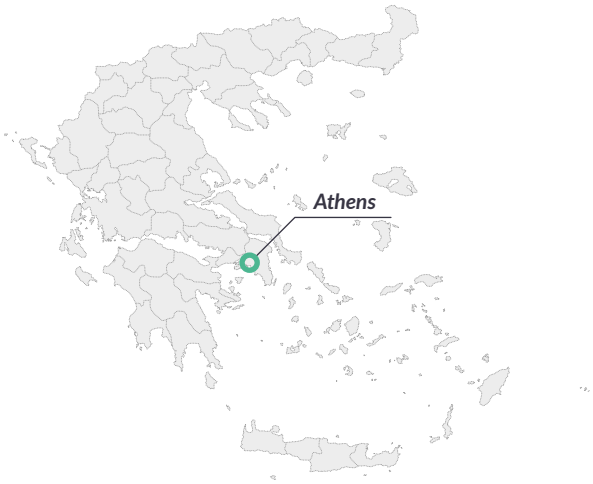
Gartner Hype Cycle



Greece

Country Map

Find your local chapter



Regional Chairs

Athens

Evangelos Lianos *evangelos.lianos@fibree.org*
Paul Tzelepis *paul.tzelepis@fibree.org*
Stefanie Behrendt *stefanie.behrendt@fibree.org*

Country Facts

Source: Wikipedia

Athens
Capital

10,718,565
Population

Euro
Currency

Greek
Language

$194.376 billion
GDP

FIBREE Facts

October 2019
First chapter

< 1000
Size of community

3
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum, Bitcoin***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

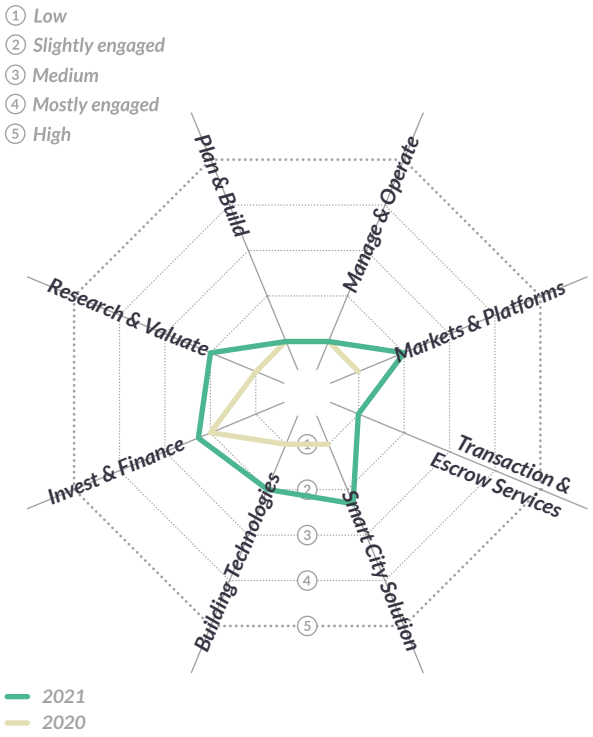
» ***61***

Research on Blockchain and Real Estate

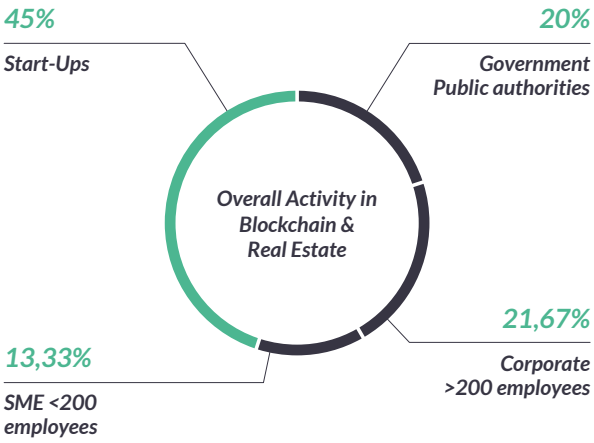
Universities and education programs in the field of blockchain and real estate.

Technical University of Athens

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

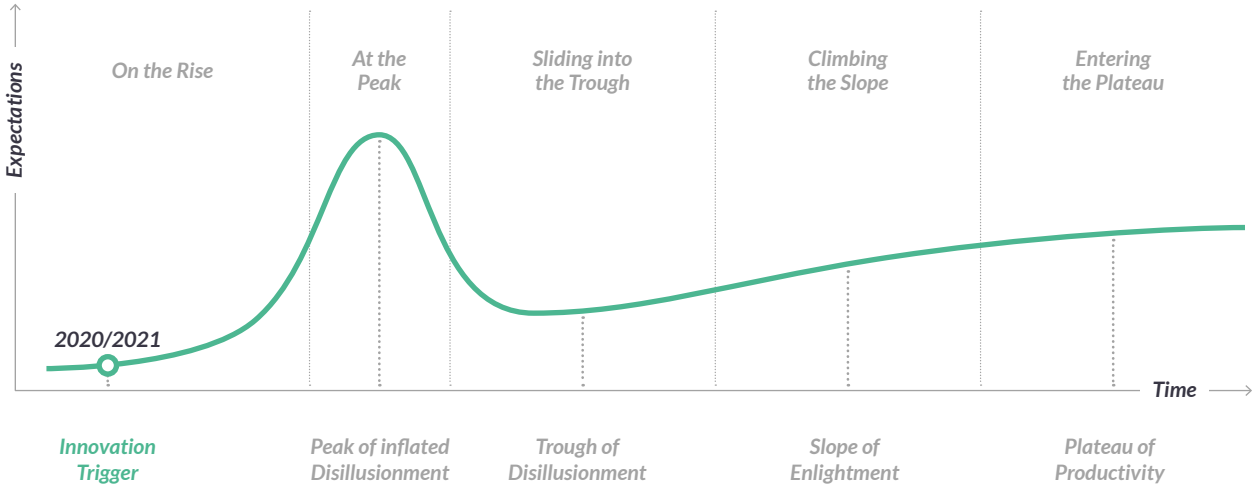
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	1	3	2
Global ranking	#41	#17	#30

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Hungary

Country Map

Find your local chapter

Regional Chairs

Budapest
Kornel Kalocsai kornel.kalocsai@fibree.org

Country Facts

Source: Wikipedia

Budapest
Capital

9,730,000
Population

Forint
Currency

Hungarian
Language

$149.939 billion
GDP

FIBREE Facts

May 2019
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» Hyperledger

Readiness by Financial Authorities to Accept Blockchain Applications

» No

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» 0

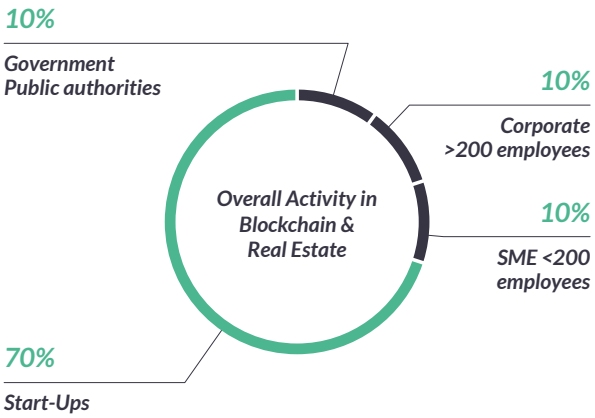
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

Budapest University of Technology and Economy

Level of Engagement with Blockchain in Defined Segments

Sector Activity



Product Database Keyfigures

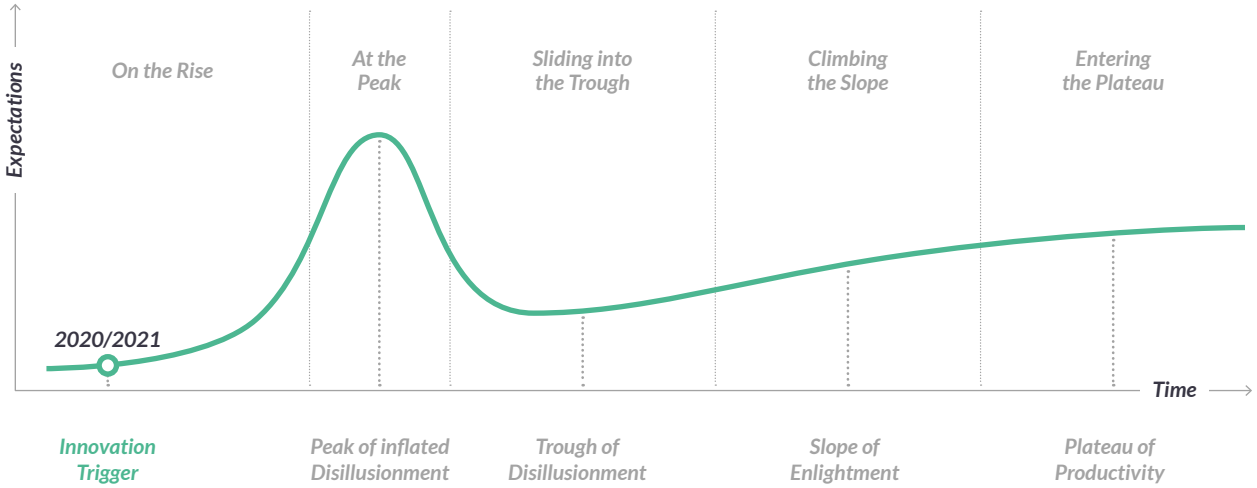
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	0	1	2
Global ranking	-	#33	#40

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Country Map

Find your local chapter

Regional Chairs

- **Bangalore**
  Rajesh D'Souza rajesh.dsouza@fibree.org
- **Hyderabad**
  Azmatullah Muhammad
  azmatullah.muhammad@fibree.org
- **Kolkata**
  Arnab Paul arnab.paul@fibree.org
- **Pune**
  Darshana Parmar Jain darshana.parmar.jain@fibree.org
- **Raipur**
  Bishal Goyal bishal.goyal@fibree.org

Country Facts

Source: Wikipedia

New Delhi
Capital

1,352,642,280
Population

Indian Rupee
Currency

Hindi, English
Language

$3.050 trillion
GDP

FIBREE Facts

October 2018
First chapter

< 50
Size of community

5
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» *Hyperledger*

Readiness by Financial Authorities to Accept Blockchain Applications

» *Open, but not there yet*

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

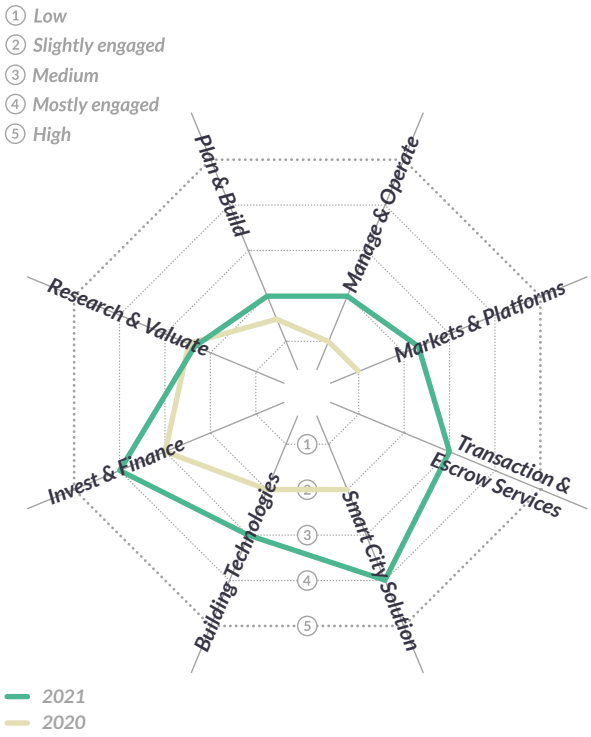
» *97*

Research on Blockchain and Real Estate

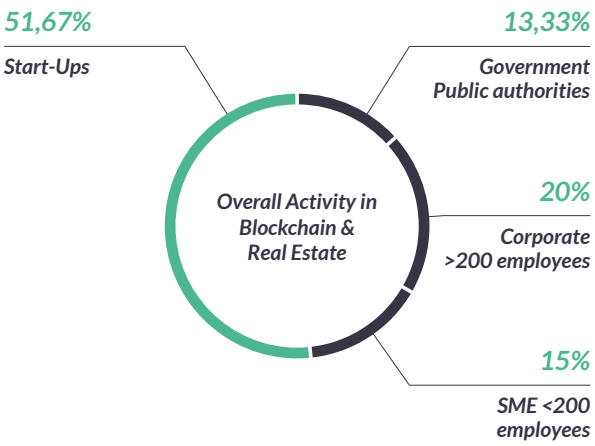
Universities and education programs in the field of blockchain and real estate.

IIT Madras, MIT Pune, IIT Kharagpur, IIT Hyderabad

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

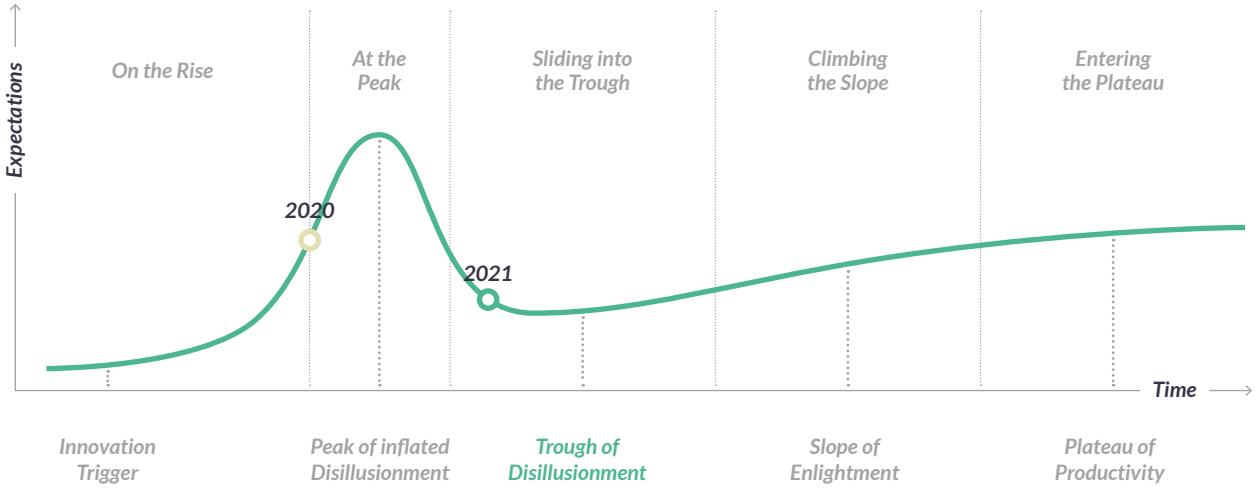
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	1	3	8
Global ranking	#41	#13	#13

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Ireland

Country Map

Find your local chapter

Regional Chairs

Dublin
David Lyons david.lyons@fibree.org

Country Facts

Source: Wikipedia

Dublin
Capital

4,977,400
Population

Euro
Currency

Irish, English
Language

$477 billion
GDP

FIBREE Facts

July 2020
First chapter

< 500
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Yes**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» **84**

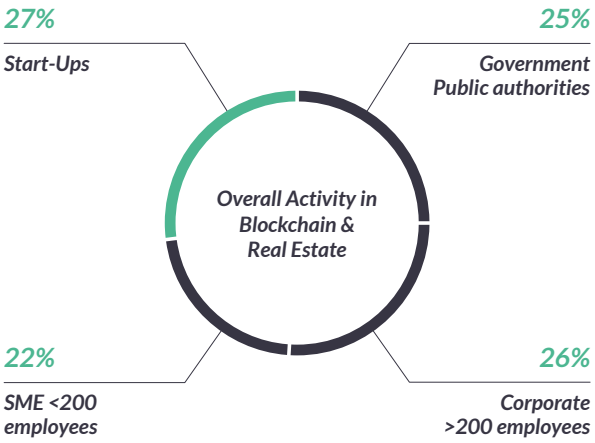
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

-

Level of Engagement with Blockchain in Defined Segments

Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

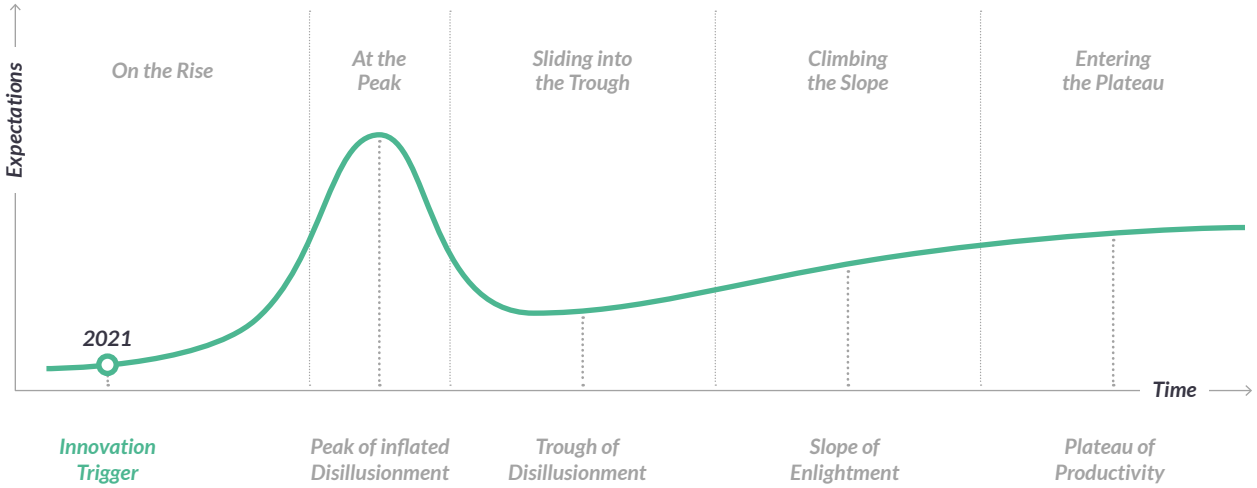
	2019	2020	2021
Number of products	1	0	4
Global ranking	#41	-	#17

Product Database by Segment

Active products 2021 and change directions since 2020.

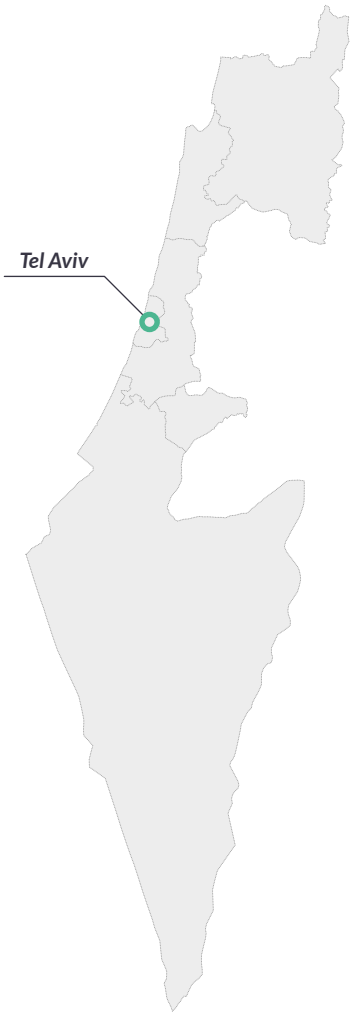
4 ↗
Invest & Finance

Gartner Hype Cycle



Country Map

Find your local chapter



Regional Chairs

Tel Aviv
Ido Shacham *ido.shacham@fibree.org*
Or Perelman *or.perelman@fibree.org*
Yael Tamar *yael.tamar@fibree.org*

Country Facts

Source: Wikipedia

Jerusalem
Capital

9,355,340
Population

New Shekel
Currency

Hebrew
Language

$410.501 billion
GDP

FIBREE Facts

August 2018
First chapter

< 500
Size of community

3
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Open, but not there yet**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

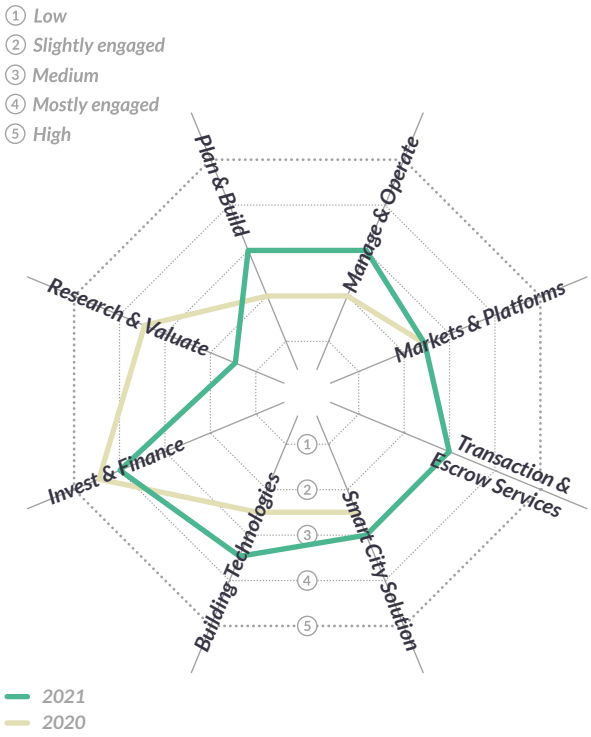
» **414**

Research on Blockchain and Real Estate

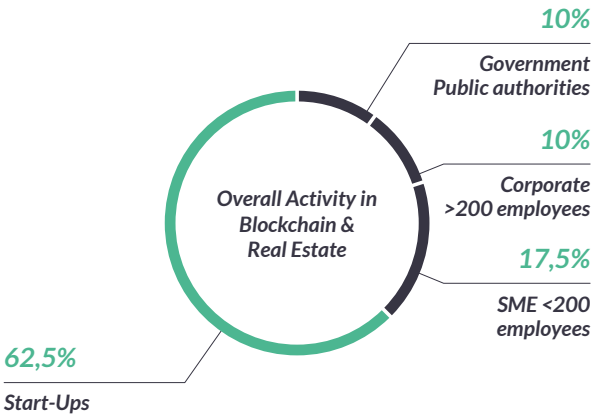
Universities and education programs in the field of blockchain and real estate.

Tel Aviv University

Level of Engagement with Blockchain in Defined Segments



Sector Activity



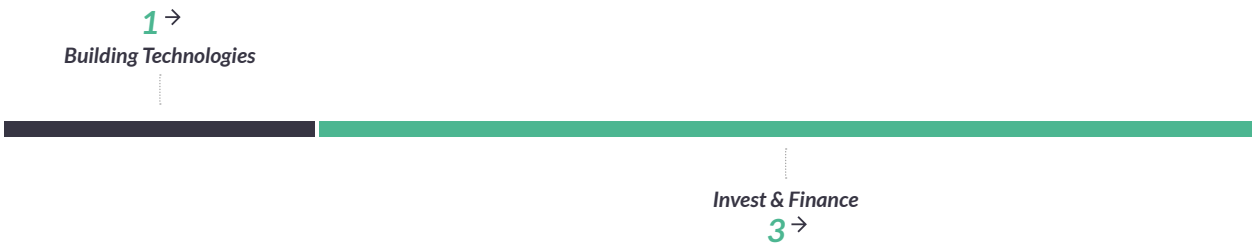
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

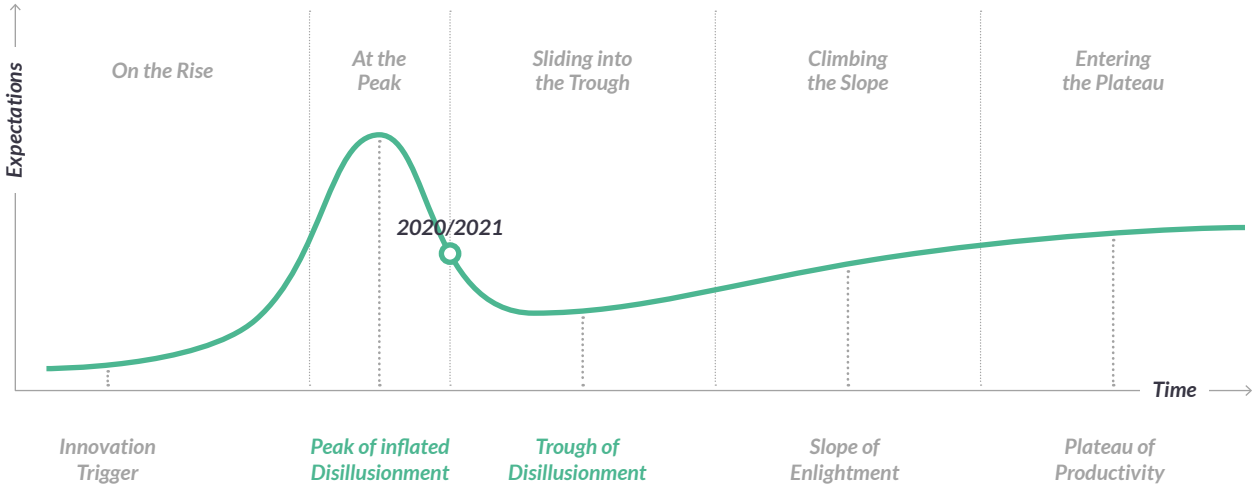
	2019	2020	2021
Number of products	2	4	4
Global ranking	#34	#13	#17

Product Database by Segment

Active products 2021 and change directions since 2020.

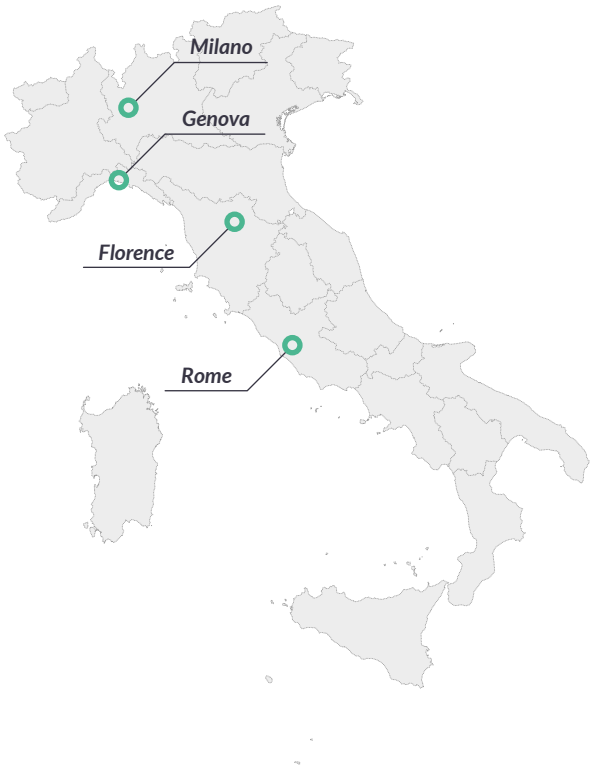


Gartner Hype Cycle



Country Map

Find your local chapter



Regional Chairs

- **Genova**
  Federico Garaventa federico.garaventa@fibree.org
- **Florence**
  Gianfranco Dote gianfranco.dote@fibree.org
- **Milano**
  Alex Dell'Orto alex.dellorto@fibree.org
  Emanuele Rizzardi emanuele.rizzardi@fibree.org
  Francesco Filippo Bruno francesco.bruno@fibree.org
- **Rome**
  Patrizia Giannini patrizia.giannini@fibree.org

Country Facts

Source: Wikipedia

Rome
Capital

60,317,116
Population

Euro
Currency

Italian
Language

$2.106 trillion
GDP

FIBREE Facts

July 2018
First chapter

< 500
Size of community

6
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum, Bitcoin**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Open, but not there yet**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

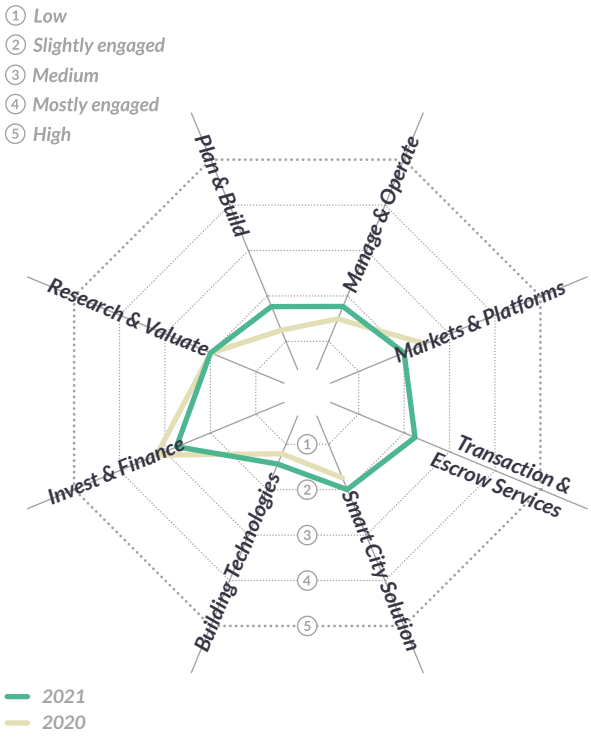
» **126**

Research on Blockchain and Real Estate

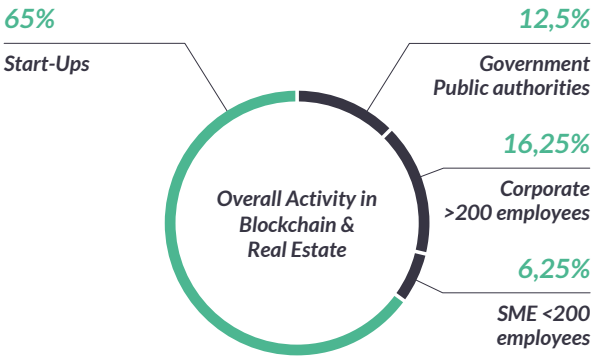
Universities and education programs in the field of blockchain and real estate.

Politecnico di Milano, Università Federico II Napoli, Bocconi Milano, Politecnico Turin

Level of Engagement with Blockchain in Defined Segments



Sector Activity



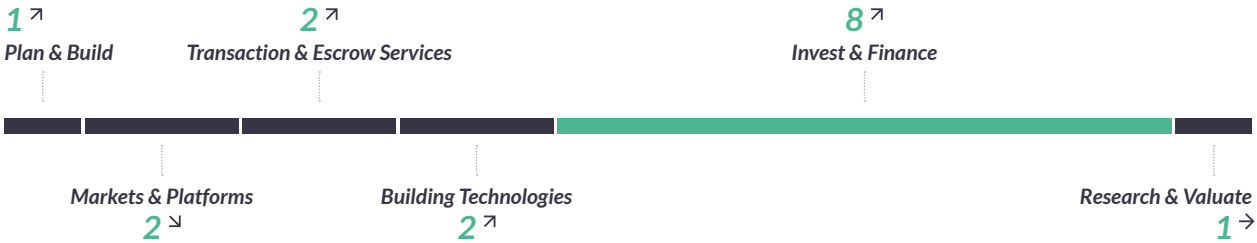
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

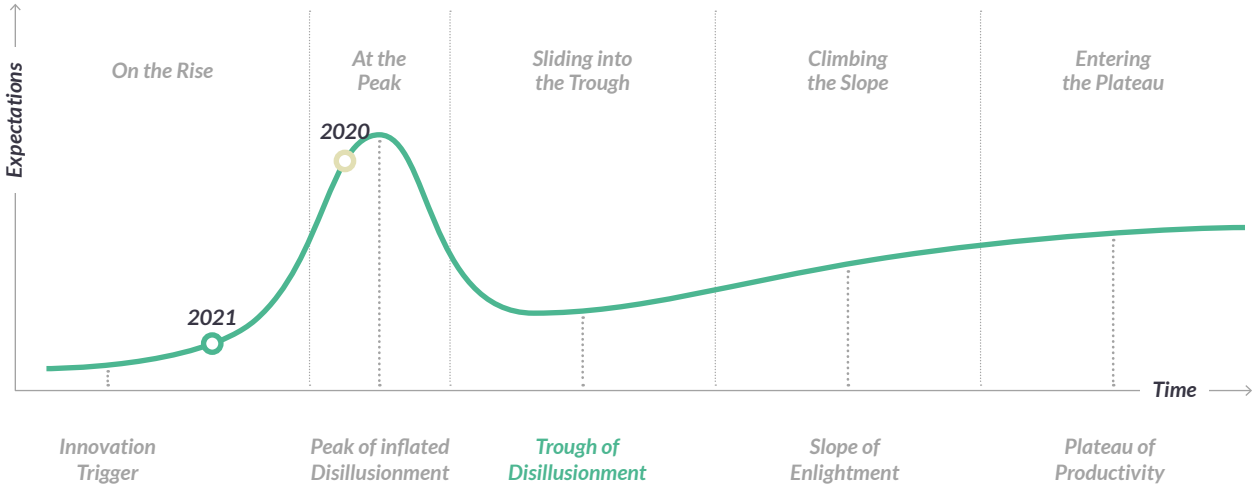
	2019	2020	2021
Number of products	4	7	16
Global ranking	#16	#11	#7

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Kenya

Country Map

Find your local chapter

Regional Chairs

Nairobi
Samuel Ouko *samuel.ouko@fibree.org*

Country Facts

Source: Wikipedia

Nairobi
Capital

54,985,698
Population

Kenyan Shilling
Currency

English, Swahili
Language

$109.116 billion
GDP

FIBREE Facts

January 2019
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Hyperledger***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***No***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

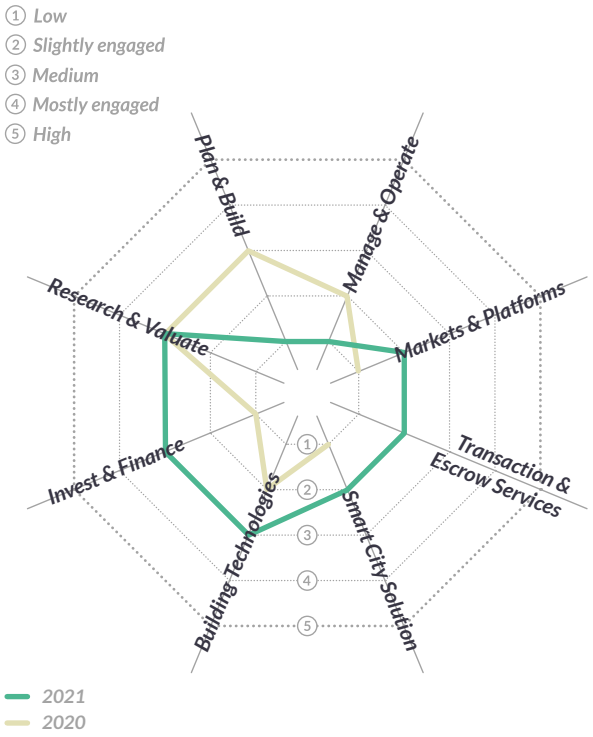
» ***19***

Research on Blockchain and Real Estate

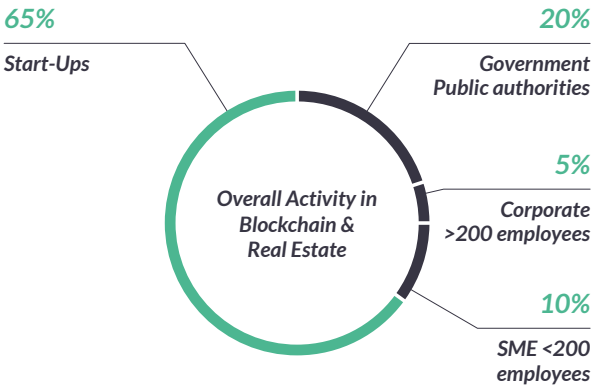
Universities and education programs in the field of blockchain and real estate.

Strathmore University

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

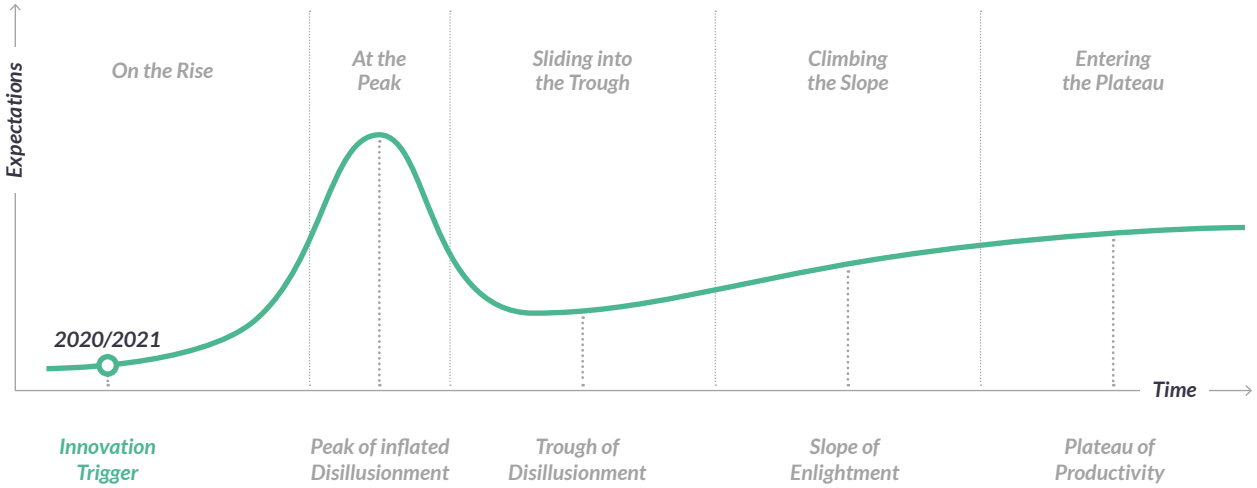
	2019	2020	2021
Number of products	4	1	2
Global ranking	#41	#33	#40

Product Database by Segment

Active products 2021 and change directions since 2020.

2 ↗
Invest & Finance

Gartner Hype Cycle



Luxembourg

Country Map

Find your local chapter

Regional Chairs

Luxembourg
Audrey Baverel *audrey.baverel@fibree.org*

Country Facts

Source: Wikipedia

Luxembourg City
Capital

633,622
Population

Euro
Currency

Luxembourgish, French, German
Language

$69.453 billion
GDP

FIBREE Facts

June 2020
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ripple***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» ***68***

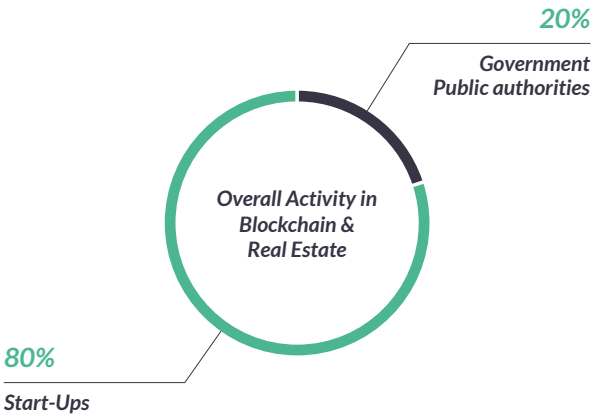
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

University of Luxembourg

Level of Engagement with Blockchain in Defined Segments

Sector Activity



Product Database Keyfigures

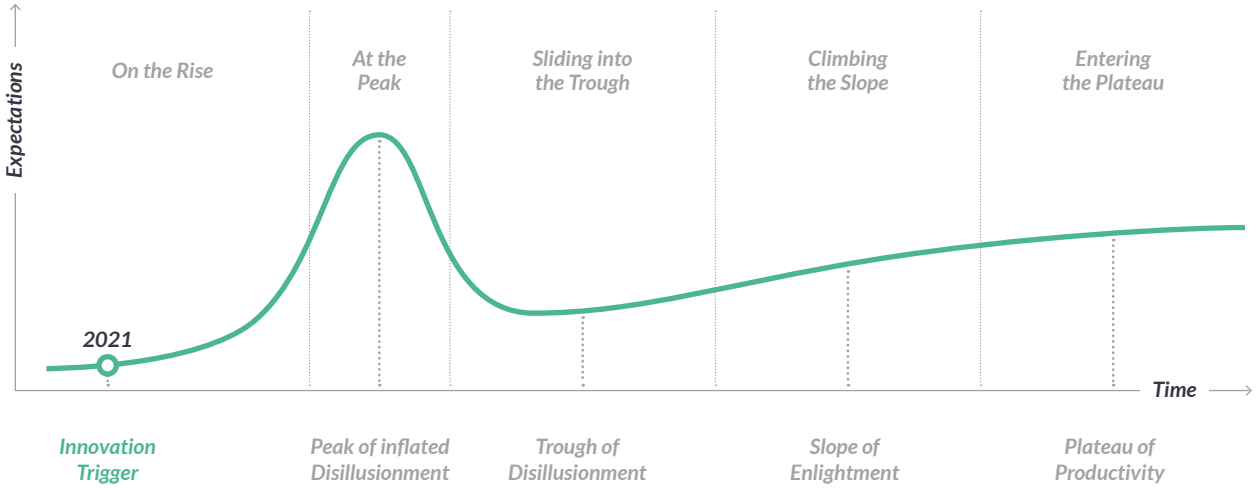
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	2	3	6
Global ranking	#34	#17	#14

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Malta

Country Map

Find your local chapter

Regional Chairs

Valletta
Andrea Romaoli andrea.romaoli@fibree.org

Country Facts

Source: Wikipedia

Valletta
Capital

514,564
Population

Euro
Currency

Maltese, English
Language

$15.134 billion
GDP

FIBREE Facts

September 2019
First chapter

< 100
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Bitcoin**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Yes**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» **20**

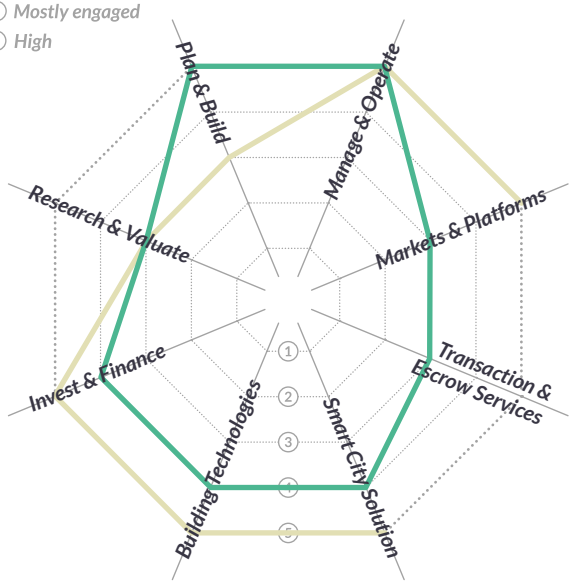
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

L-Università ta' Malta (UM)

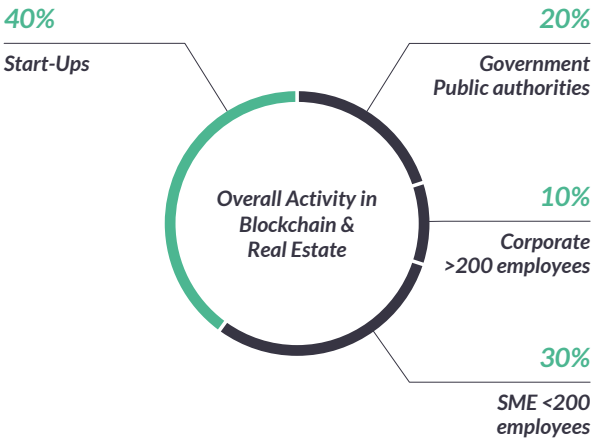
Level of Engagement with Blockchain in Defined Segments

① Low
② Slightly engaged
③ Medium
④ Mostly engaged
⑤ High



2021
2020

Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

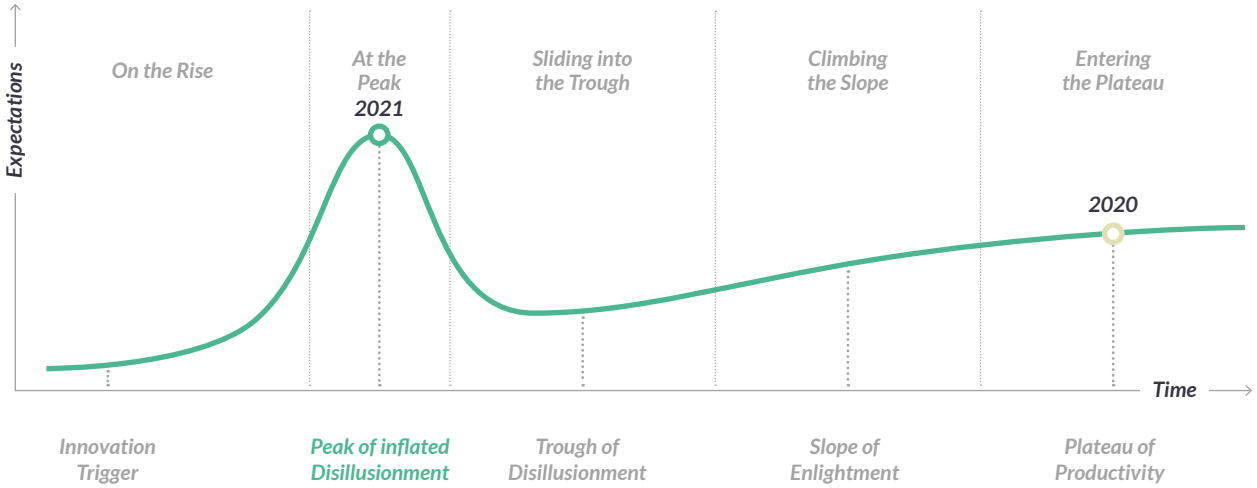
	2019	2020	2021
Number of products	1	1	2
Global ranking	#41	#33	#30

Product Database by Segment

Active products 2021 and change directions since 2020.

2 ↗
Markets & Platforms

Gartner Hype Cycle



Mexico

Country Map

Find your local chapter

Regional Chairs

Mexico City

Alejandro Vélez *alejandro.velez@fibree.org*
Carlos Vazquez *carlos.vazquez@fibree.org*
Enrique J. Suárez Avilés *enrique.suarez@fibree.org*
Francisco Arias *francisco.arias@fibree.org*

Country Facts

Source: Wikipedia

Mexico City
Capital

126,014,024
Population

Peso
Currency

Spanish
Language

$1.322 trillion
GDP

FIBREE Facts

February 2020
First chapter

< 500
Size of community

4
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum, Tezos, Hyperledger***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» ***49***

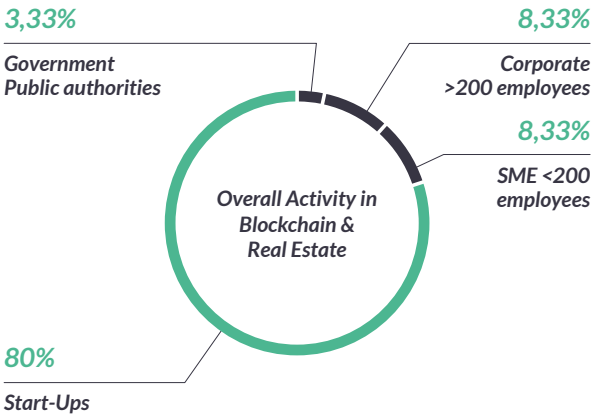
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

Uady University, Parque Tecnologico San Miguelense

Level of Engagement with Blockchain in Defined Segments

Sector Activity



Product Database Keyfigures

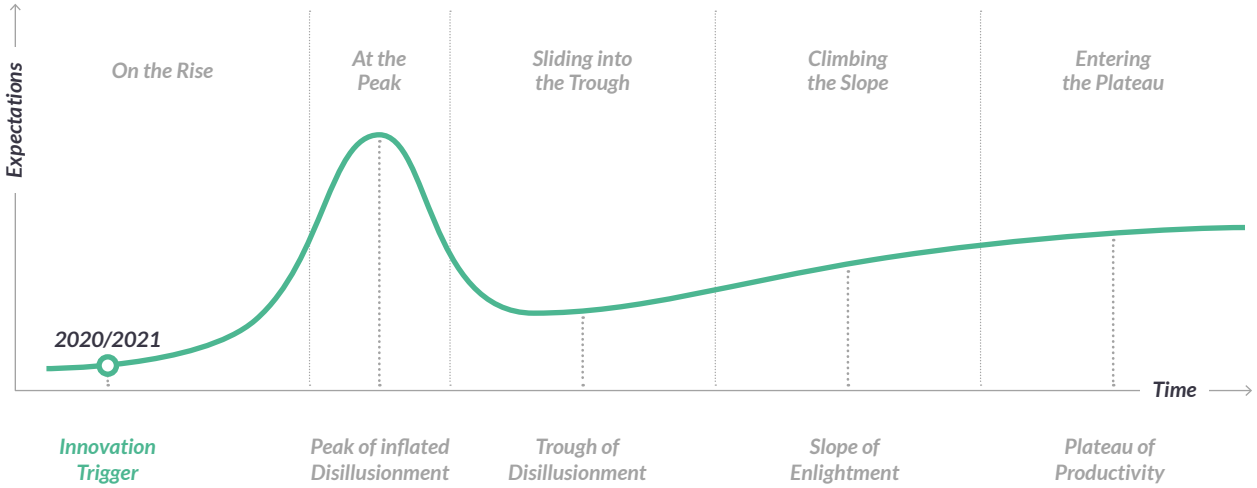
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	4	4	3
Global ranking	#16	#17	#23

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Netherlands

Country Map

Find your local chapter

Regional Chairs

- **Amsterdam**
  Jo Bronckers *jo.bronckers@fibree.org*
- **Enschede**
  Jan Veuger *jan.veuger@fibree.org*

Country Facts

Source: Wikipedia

Amsterdam
Capital

17,469,635
Population

Euro
Currency

Dutch
Language

$1.012 trillion
GDP

FIBREE Facts

July 2018
First chapter

< 500
Size of community

2
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	**Mostly digital**	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum, Bitcoin**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Open, but not there yet**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

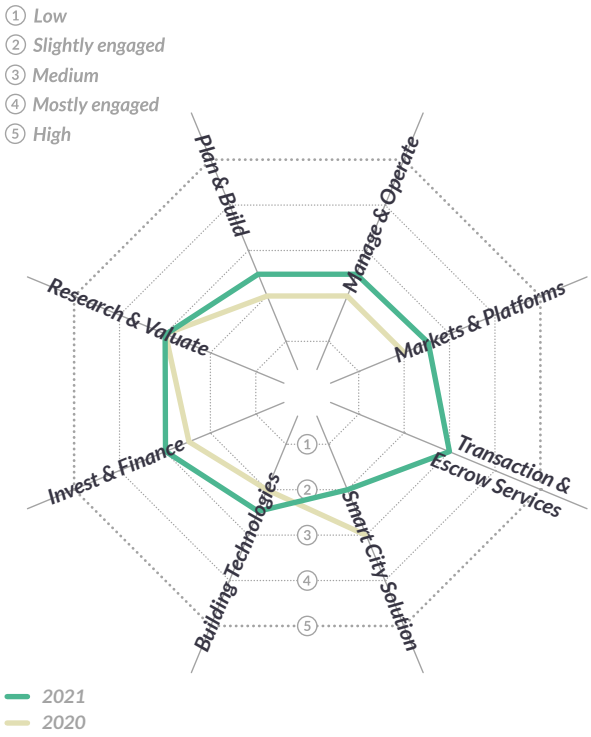
» *218*

Research on Blockchain and Real Estate

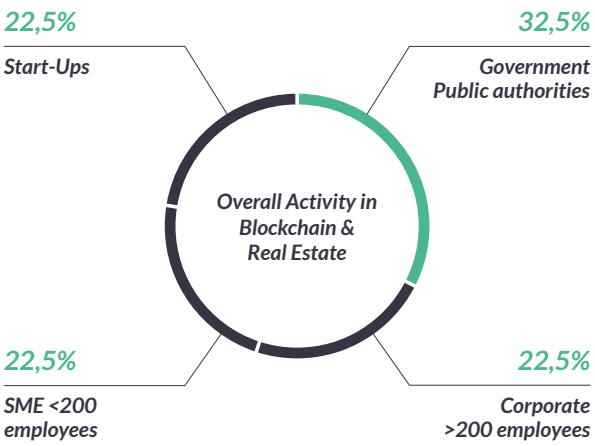
Universities and education programs in the field of blockchain and real estate.

Saxion University / TU Eindhoven / TU Delft / Tias School for Business and Society

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

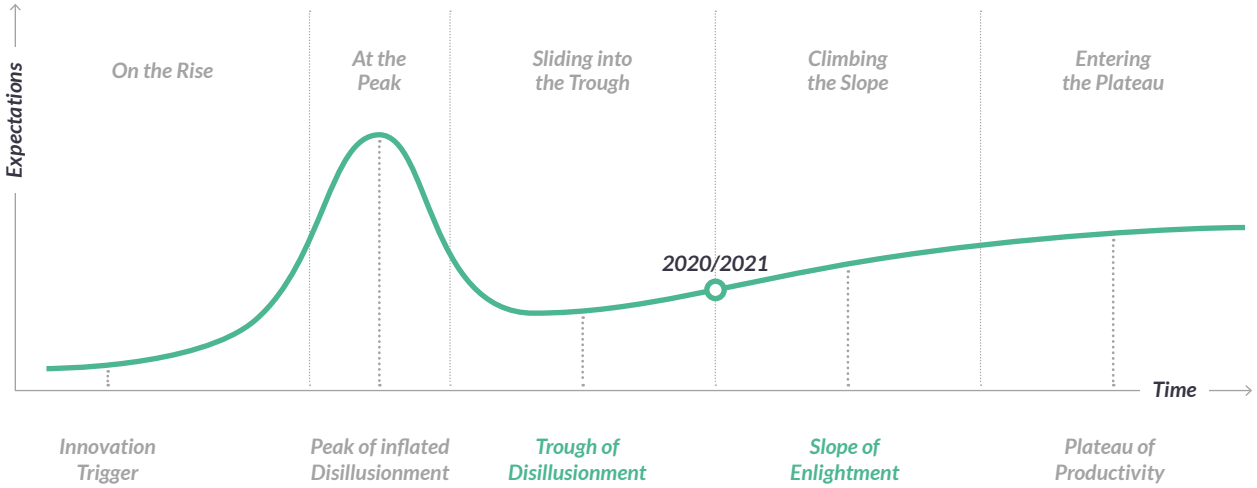
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	26	14	11
Global ranking	#5	#6	#9

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Nigeria

Country Map

Find your local chapter

Regional Chairs

- ***Abuja***
  Justin Okpu *justin.okpu@fibree.org*
  Nura Jibo *nura.jibo@fibree.org*
- ***Lagos***
  Ifemayowa Omotunde-Bank
  Ifemayowa.omotunde@fibree.org
  Jide Oluwadeyi *jide.oluwadeyi@fibree.org*
  Sola Enitan *sola.enitan@fibree.org*

Country Facts

Source: Wikipedia

Abuja
Capital

211,400,708
Population

Naira
Currency

English
Language

$514.049 billion
GDP

FIBREE Facts

April 2020
First chapter

< 500
Size of community

5
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum, Bitcoin***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» ***24***

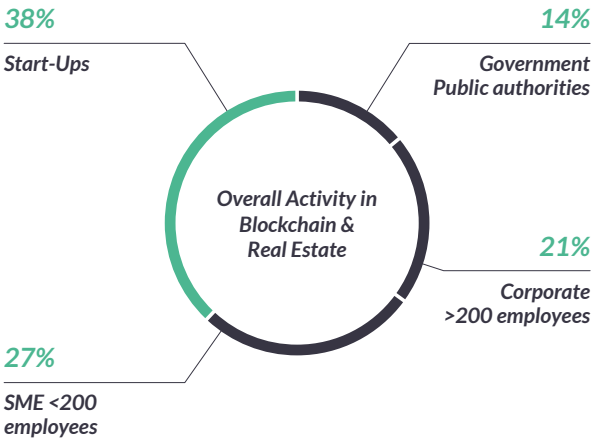
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

University of Abuja (UNIABUJA), Enugu State University of Science and Technology (ESUT), University of Lagos (UNILAG), Covenant University

Level of Engagement with Blockchain in Defined Segments

Sector Activity



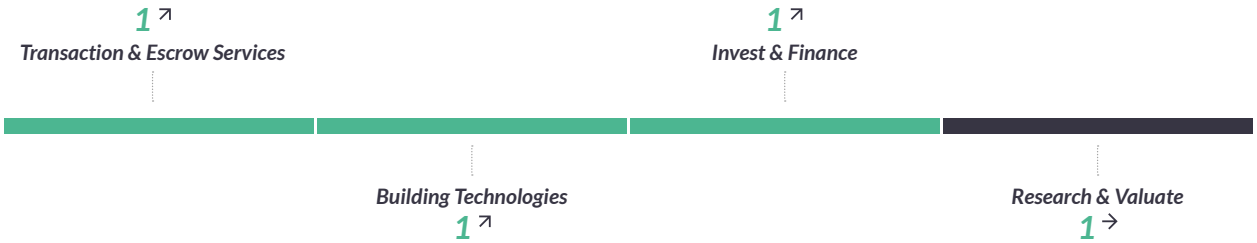
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

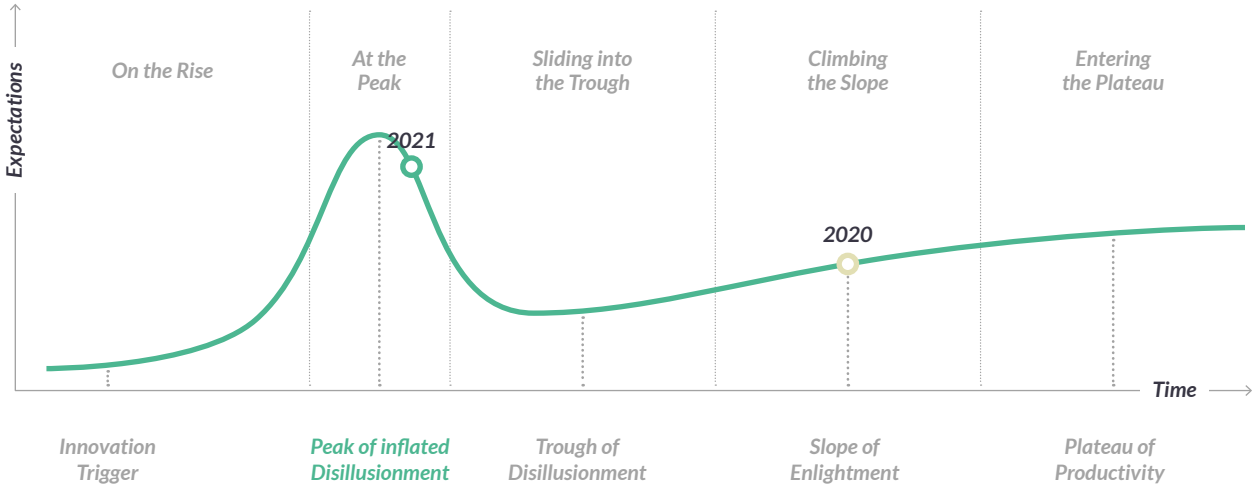
	2019	2020	2021
Number of products	4	1	4
Global ranking	#16	#36	#17

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Poland

Country Map

Find your local chapter

Regional Chairs

Warsaw
Adrian Karczewicz adrian.karczewicz@fibree.org
Alexander Morari alexander.morari@fibree.org
Sylwia Toczyska sylwia.toczyska@fibree.org

Country Facts

Source: Wikipedia

Warsaw
Capital

38,268,000
Population

Polish Złoty
Currency

Polish
Language

$642 billion
GDP

FIBREE Facts

January 2019
First chapter

< 100
Size of community

3
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	**Mostly digital**	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Open, but not there yet**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» **109**

Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

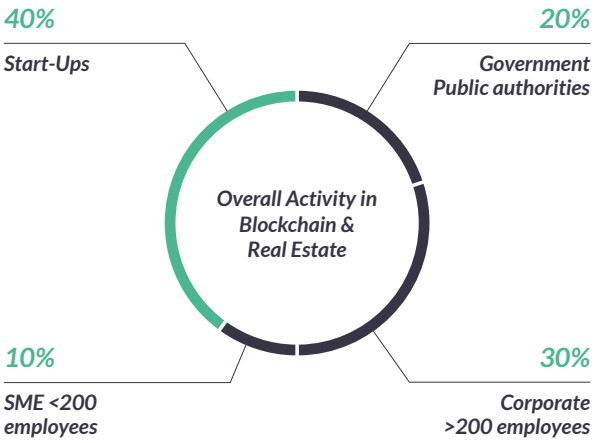
-

Level of Engagement with Blockchain in Defined Segments

① Low
② Slightly engaged
③ Medium
④ Mostly engaged
⑤ High

2021
2020

Sector Activity



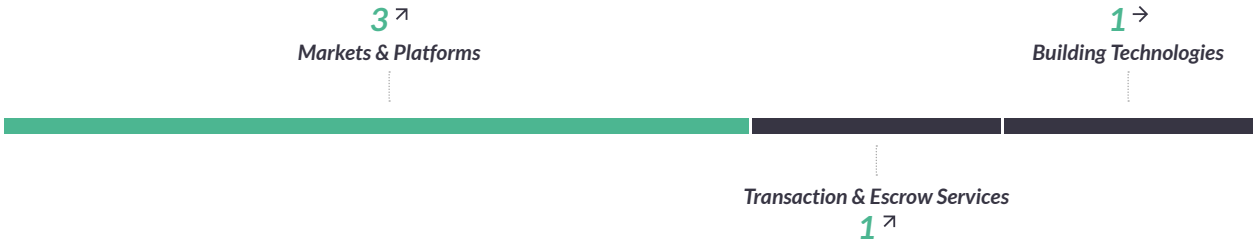
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

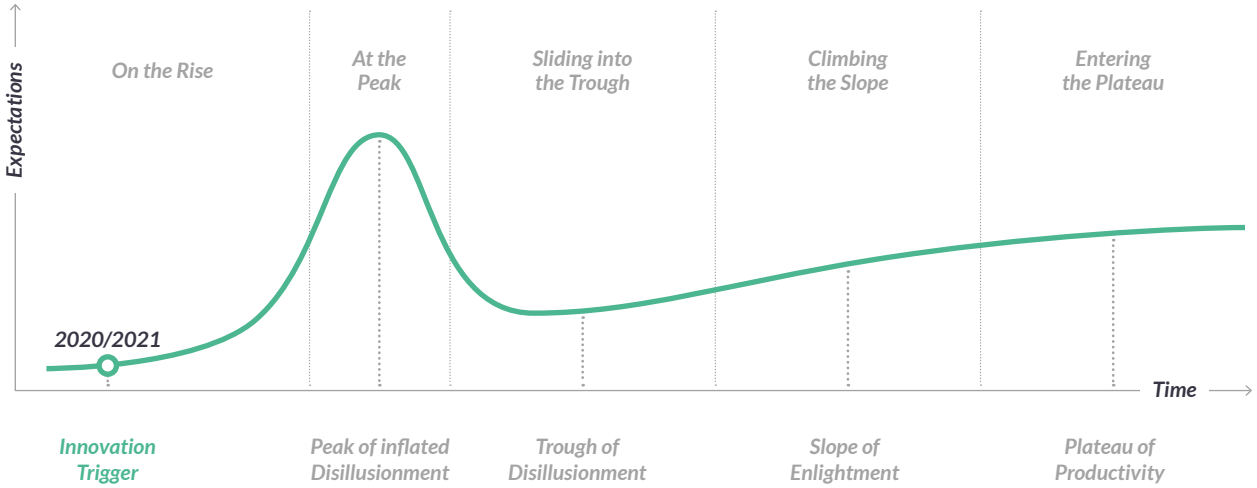
	2019	2020	2021
Number of products	3	3	5
Global ranking	#25	#17	#17

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Portugal

Country Map

Find your local chapter

Regional Chairs

Lisbon
Cristina Campian *cristina.campian@fibree.org*
José Reis Santos *jose.reis.santos@fibree.org*

Country Facts

Source: Wikipedia

Lisbon
Capital

10,295,909
Population

Euro
Currency

Portuguese
Language

$257.4 billion
GDP

FIBREE Facts

October 2019
First chapter

< 100
Size of community

2
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	***Partly digital, but mostly paperbased***	*Mostly digital*	*100% digital*

Most Used Technology for Blockchain Applications

» ***Ethereum***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

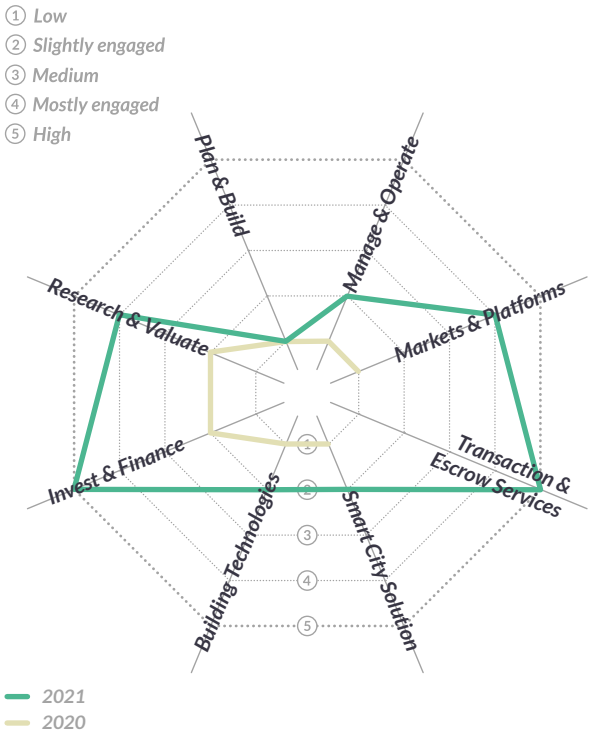
» ***112***

Research on Blockchain and Real Estate

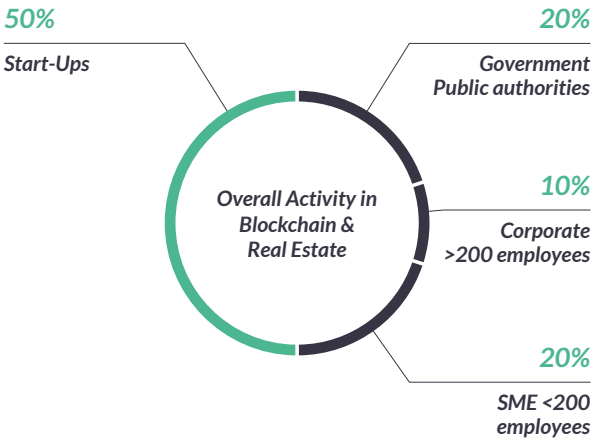
Universities and education programs in the field of blockchain and real estate.

Universidade Católica, Instituto Superior Técnico - Universidade de Lisboa, Porto Business School, ISEC Lisboa - Instituto Superior de Educação e Ciências

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

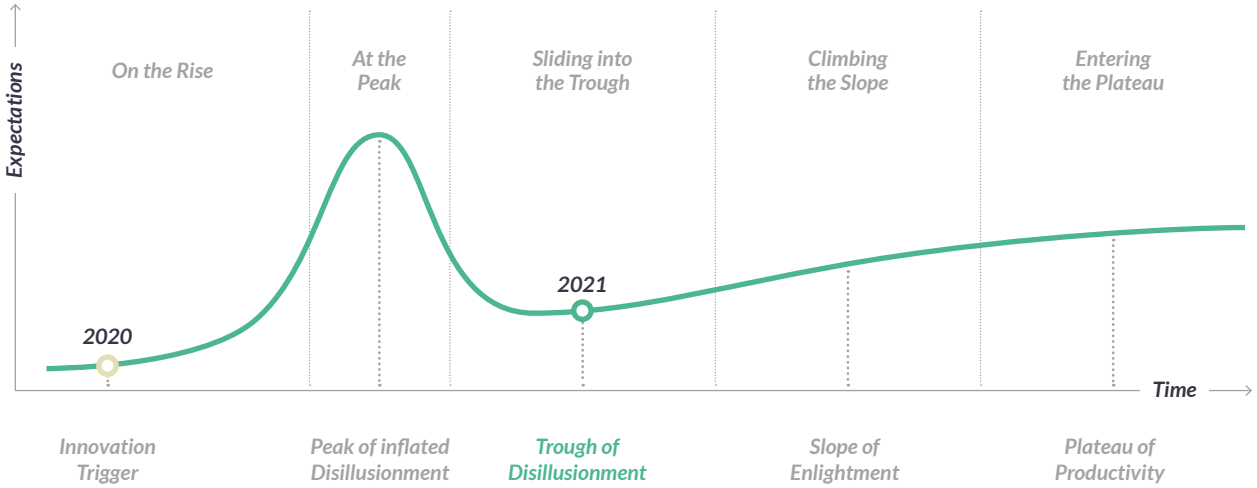
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	0	0	2
Global ranking	-	-	#30

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Russia

Country Map

Find your local chapter

Regional Chairs

- ***Moscow***
  Stephen Inscoe *stephen.inscoe@fibree.org*

Country Facts

Source: Wikipedia

Moscow
Capital

143,759,445
Population

Russian Ruble
Currency

Russian
Language

$1.710 trillion
GDP

FIBREE Facts

May 2019
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	**Mostly digital**	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» ***33***

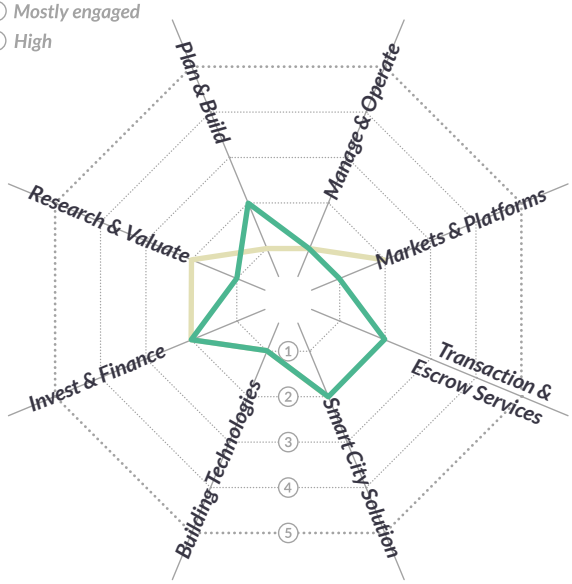
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

-

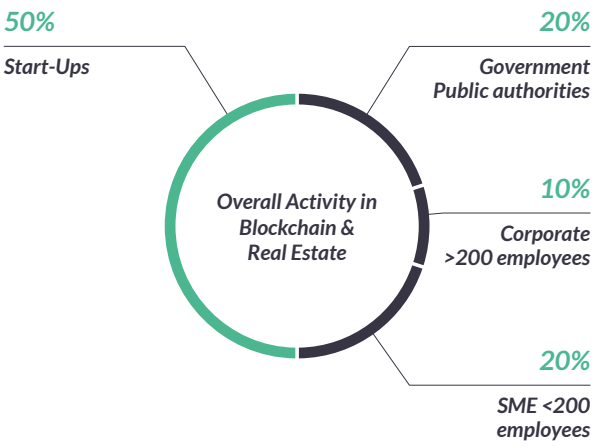
Level of Engagement with Blockchain in Defined Segments

① Low
② Slightly engaged
③ Medium
④ Mostly engaged
⑤ High



2021
2020

Sector Activity



Product Database Keyfigures

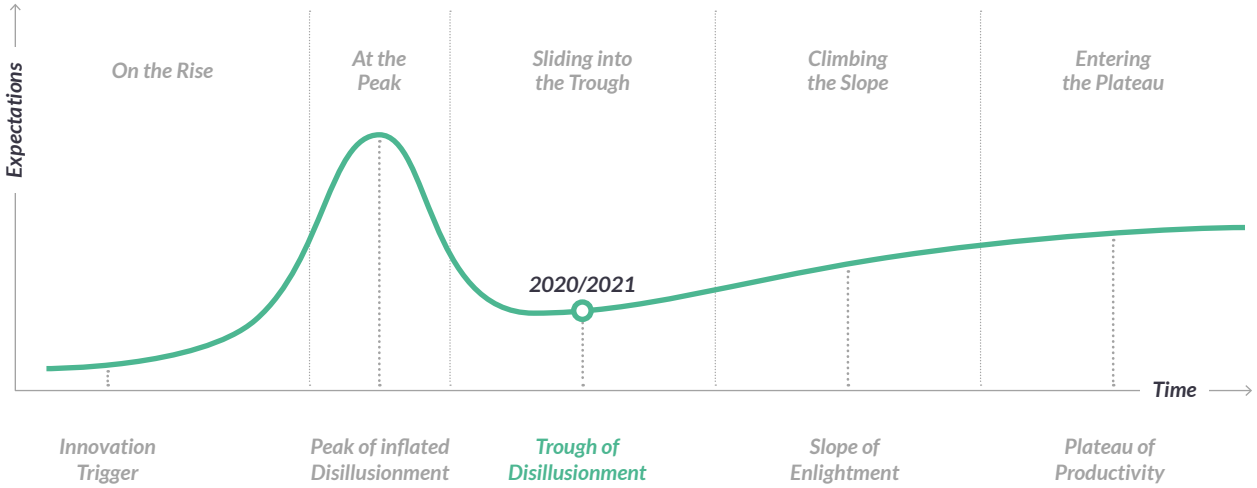
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	23	2	3
Global ranking	#23	#2	#3

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Saudi Arabia

Country Map

Find your local chapter

Regional Chairs

Riyadh
Faraj Alhouty *faraj.alhouty@fibree.org*

Country Facts

Source: Wikipedia

Riyadh
Capital

34,218,169
Population

Saudi Riyal
Currency

Arabic
Language

$779.289 billion
GDP

FIBREE Facts

February 2020
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Bitcoin***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» ***17***

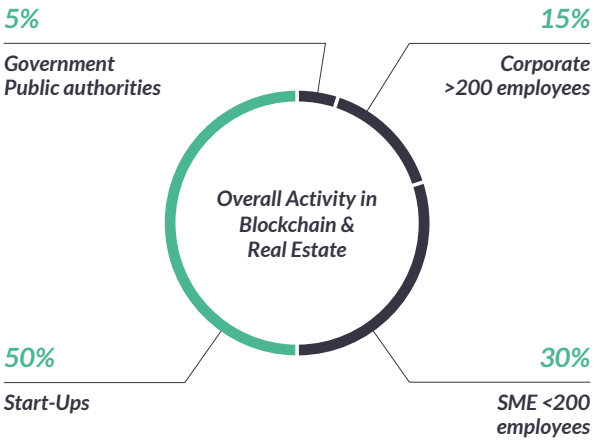
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

„Taibah University, King Abdulaziz University, King Abdullah University For Science and TechnologyKing Abdulaziz City For Science and Technology“

Level of Engagement with Blockchain in Defined Segments

Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

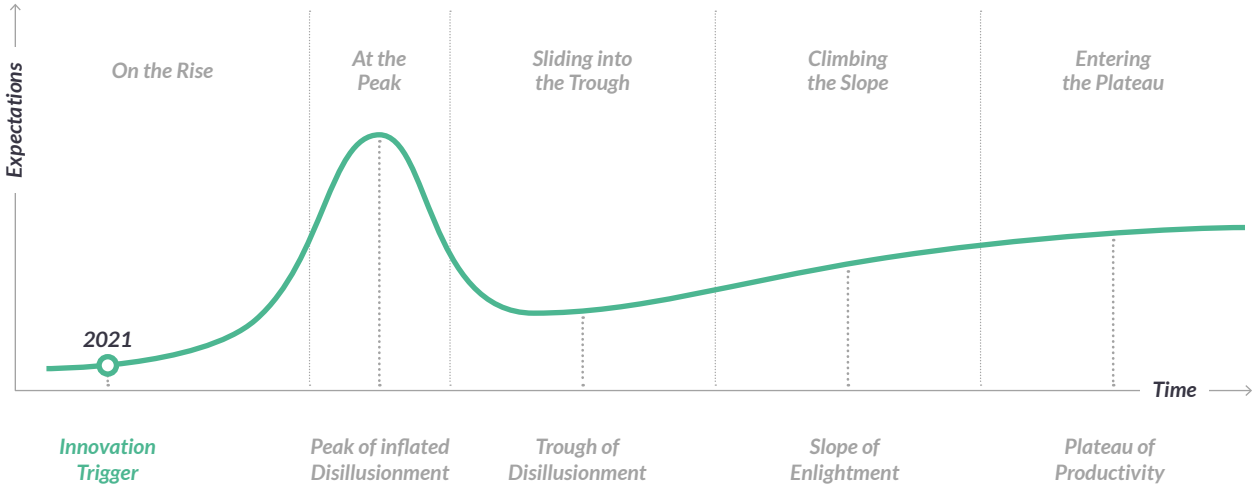
	2019	2020	2021
Number of products	0	0	2
Global ranking	-	-	#13

Product Database by Segment

Active products 2021 and change directions since 2020.

2 ↗
Invest & Finance

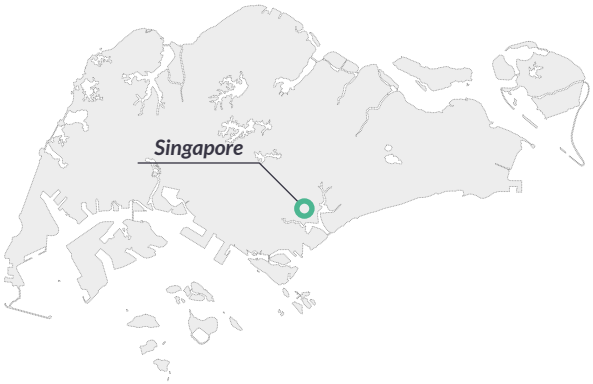
Gartner Hype Cycle



Singapore

Country Map

Find your local chapter



Regional Chairs

Singapore
Oliver Siah oliver.siah@fibree.org

Country Facts

Source: Wikipedia

Singapore
Capital

5,703,600
Population

Singapore Dollar
Currency

English, Malay, Mandarin, Tamil
Language

$374.394 billion
GDP

FIBREE Facts

September 2019
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» *Ethereum*

Readiness by Financial Authorities to Accept Blockchain Applications

» *Yes*

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

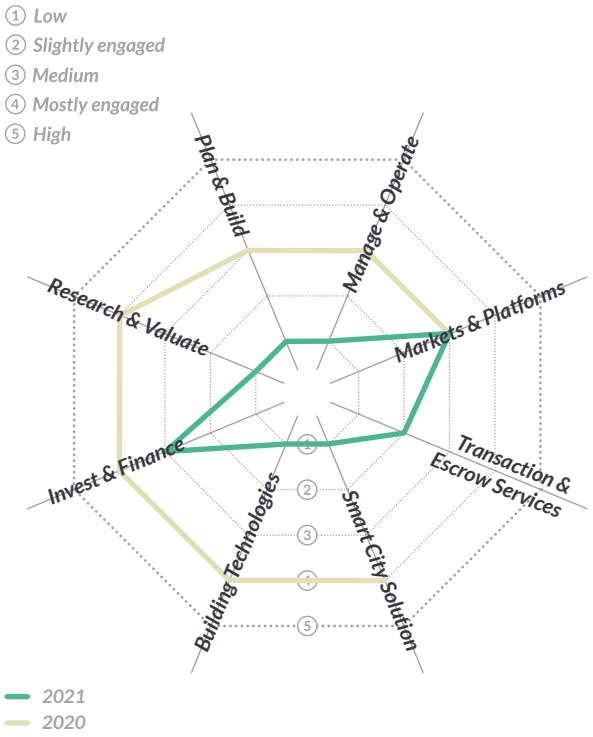
» *85*

Research on Blockchain and Real Estate

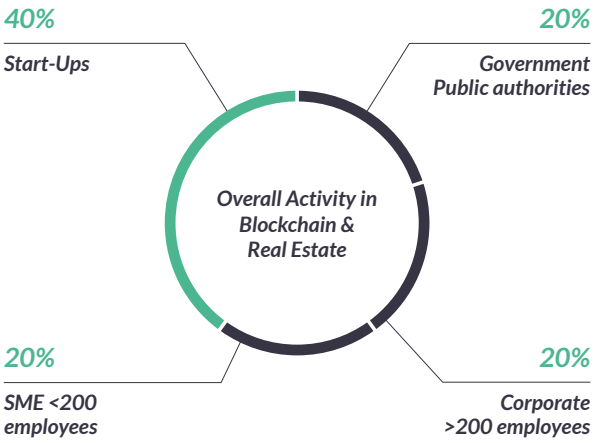
Universities and education programs in the field of blockchain and real estate.

SUSS, NUS

Level of Engagement with Blockchain in Defined Segments



Sector Activity



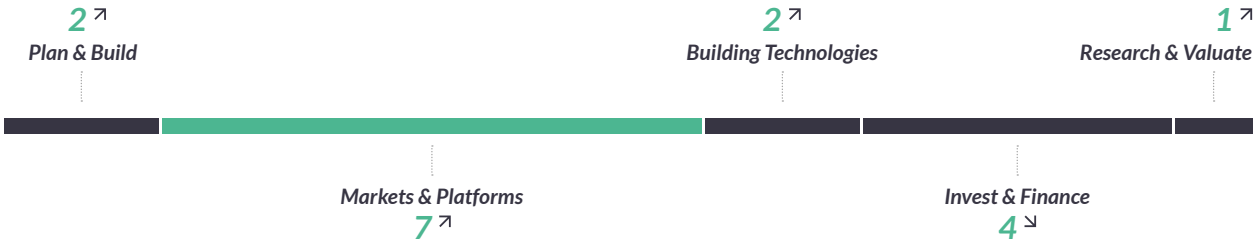
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

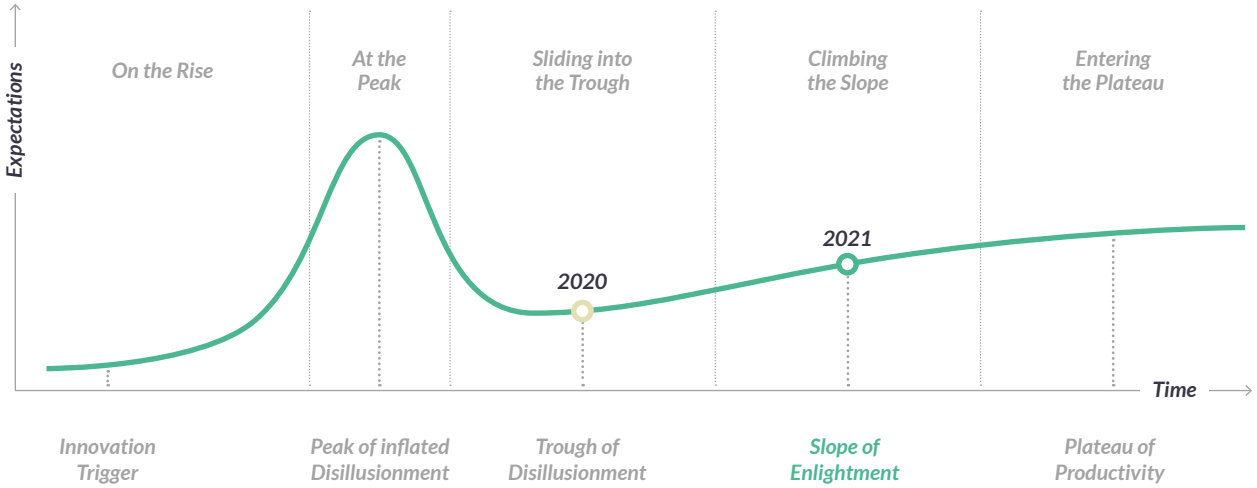
	2019	2020	2021
Number of products	28	9	16
Global ranking	#3	#10	#5

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Slovenia

Country Map

Find your local chapter

Regional Chairs

Ljubljana
Andrej Lampe *andrej.lampe@fibree.org*
Denis Petrovcic *denis.petrovcic@fibree.org*

Country Facts

Source: Wikipedia

Ljubljana
Capital

2,108,977
Population

Euro
Currency

Slovene
Language

$56 billion
GDP

FIBREE Facts

July 2018
First chapter

< 500
Size of community

2
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

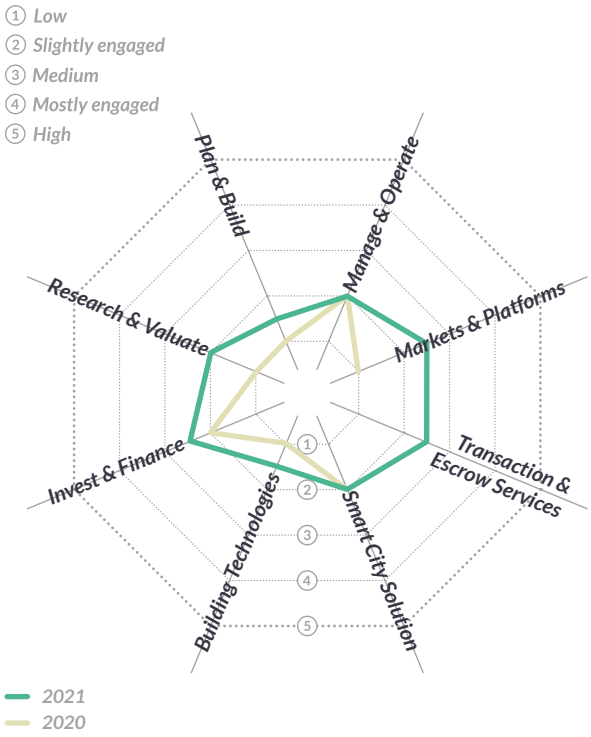
» ***47***

Research on Blockchain and Real Estate

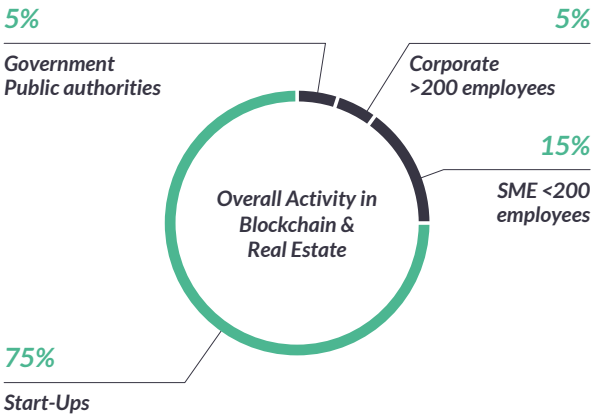
Universities and education programs in the field of blockchain and real estate.

Univerza v Ljabljani

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

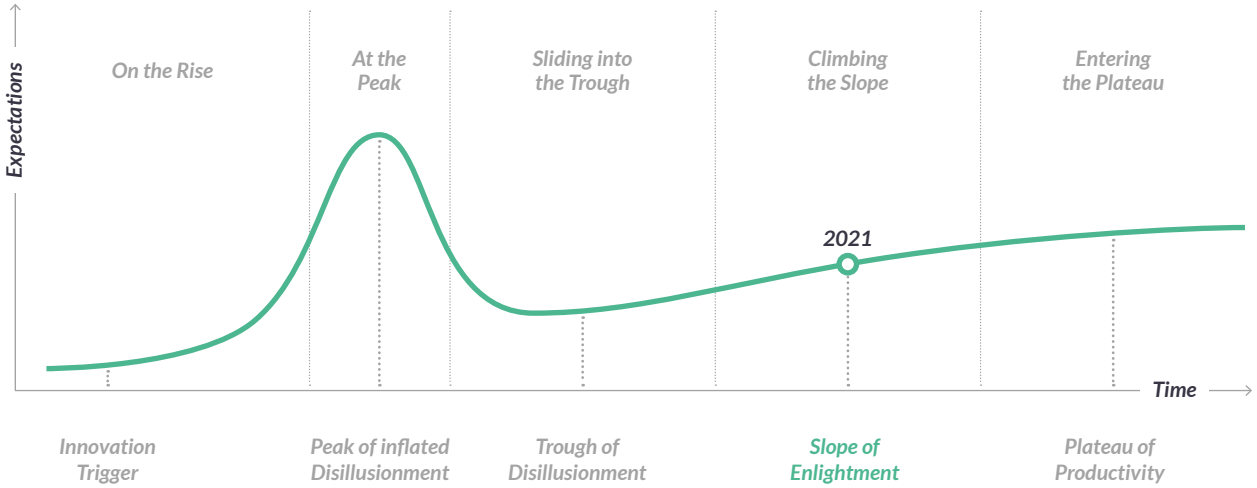
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	3	3	2
Global ranking	#25	#17	#30

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Spain

Country Map

Find your local chapter

Regional Chairs

- **Barcelona**
  Daniel Codina Guerra daniel.codina@fibree.org
  Edwin Mata edwin.mata@fibree.org
  Lorenzo Moreno lorenzo.moreno.munoz@fibree.org
- **Levante (Region)**
  Andrew Campbell-Boross
  andrew.campbell.boross@fibree.org
  José García Caballero jose.garcia.caballero@fibree.org
- **Madrid**
  Alfredo Díaz-Araque Moro
  adiazaraque@fibree.org
  Miguel Linera Alperi miguel.linera@fibree.org
- **Malaga**
  Ali Parandeh Zandpour
  ali.parandeh.zandpour@fibree.org
  Vicente Ortiz vicente.ortiz.alonso@fibree.org
- **Seville**
  Eric Sanchez Galvez eric.sanchez@fibree.org

Country Facts

Source: Wikipedia

Madrid
Capital

47,450,795
Population

Euro
Currency

Spanish
Language

$1.450 trillion
GDP

FIBREE Facts

January 2019
First chapter

< 500
Size of community

10
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» *Ethereum*

Readiness by Financial Authorities to Accept Blockchain Applications

» *Open, but not there yet*

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

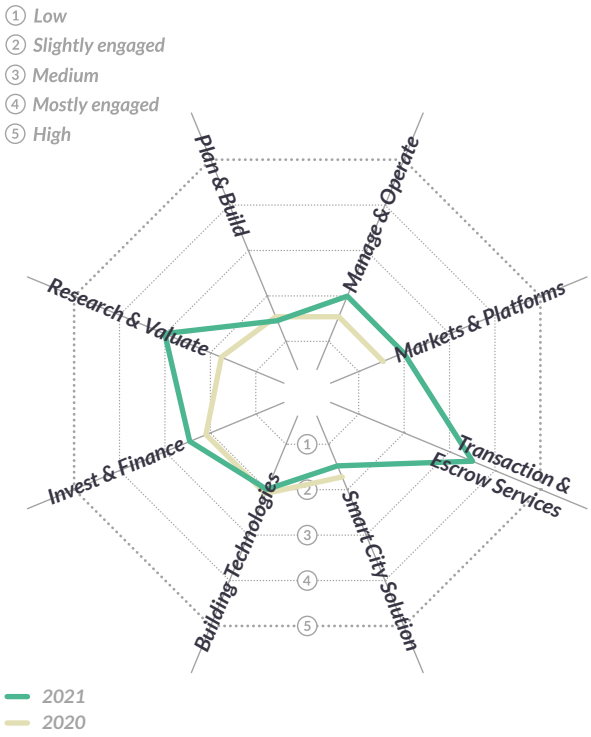
» *178*

Research on Blockchain and Real Estate

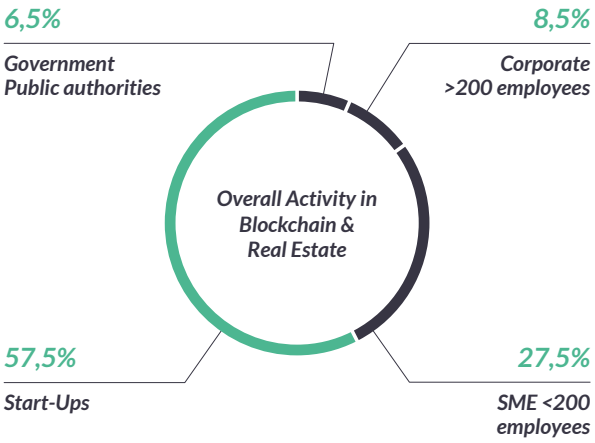
Universities and education programs in the field of blockchain and real estate.

Universidad de Malaga

Level of Engagement with Blockchain in Defined Segments



Sector Activity



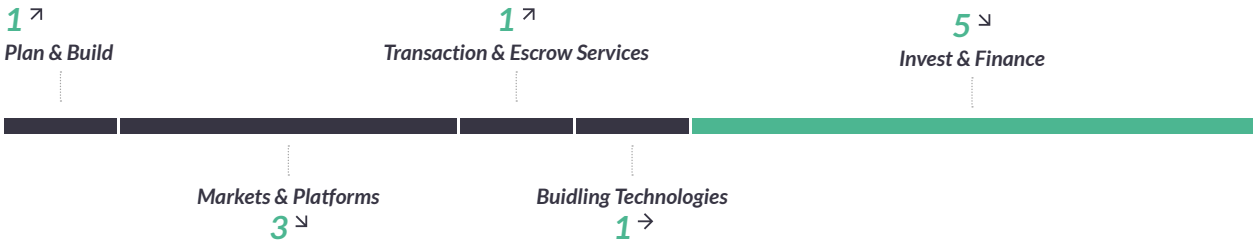
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

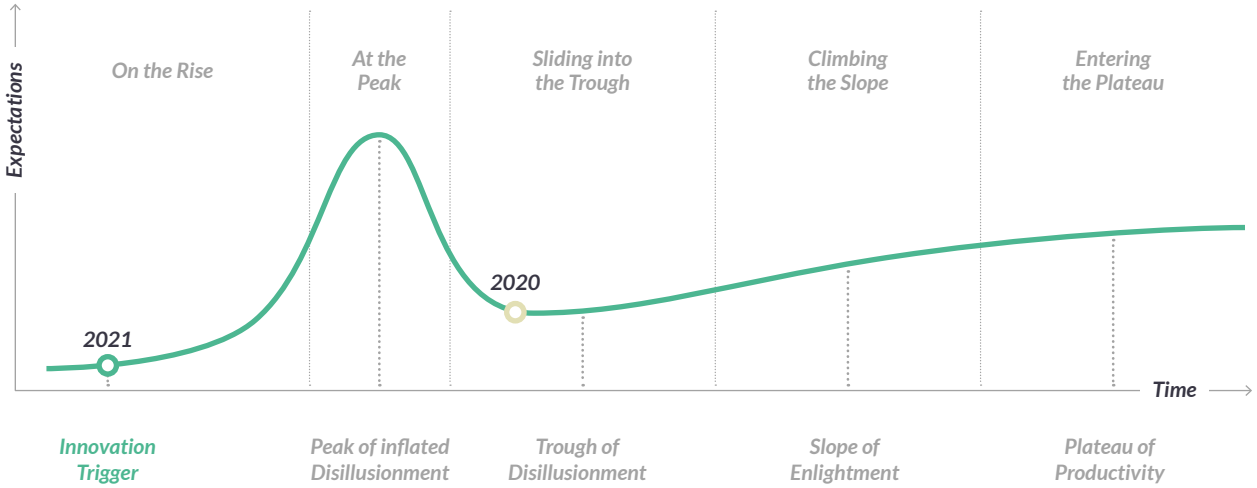
	2019	2020	2021
Number of products	15	12	11
Global ranking	#10	#8	#9

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Switzerland

Country Map

Find your local chapter

Regional Chairs

- **Lugano**
  Paolo Siligoni paolo.siligoni@fibree.org
- **Zug**
  Lutz Thelen lutz.thelen@fibree.org
  Michael Trübestein michael.truebestein@fibree.org
  Walter Strametz walter.strametz@fibree.org

Country Facts

Source: Wikipedia

Bern
Capital

8,570,146
Population

Swiss Franc
Currency

German, French, Italian, Romansh
Language

$749 billion
GDP

FIBREE Facts

July 2018
First chapter

< 1000
Size of community

4
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	**Mostly digital**	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Yes**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

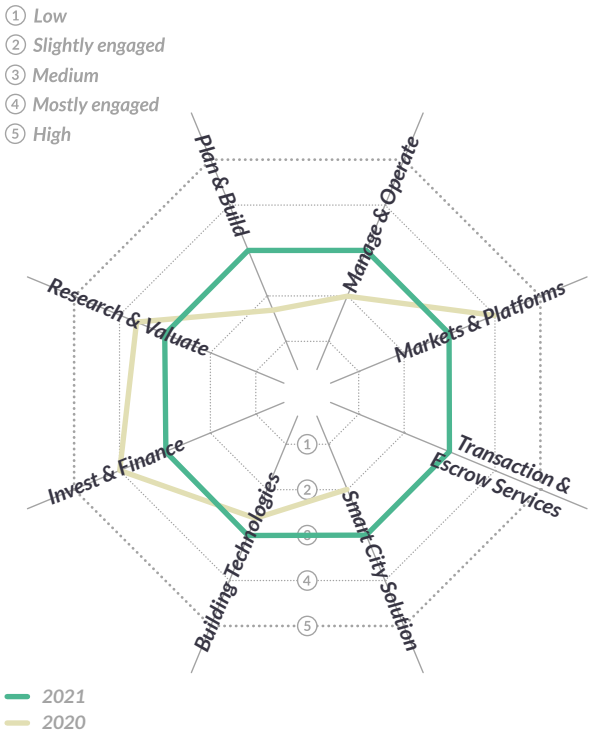
» **154**

Research on Blockchain and Real Estate

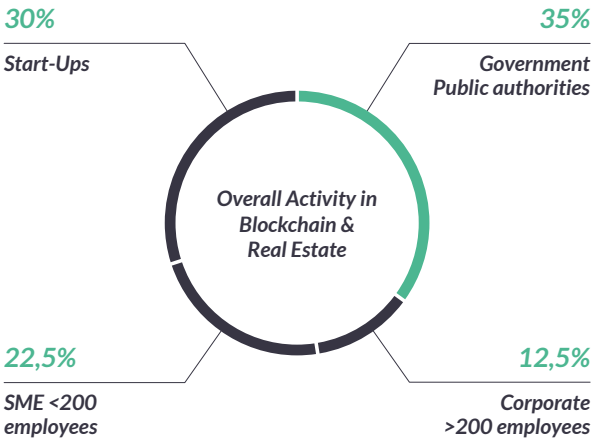
Universities and education programs in the field of blockchain and real estate.

-

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

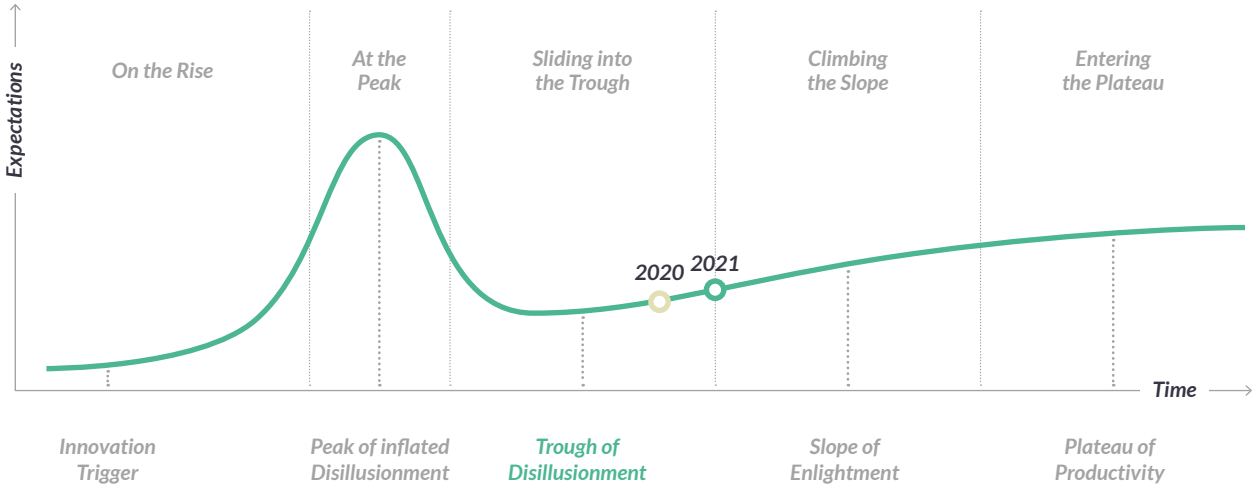
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	27	20	13
Global ranking	#4	#3	#6

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



Turkey

Country Map

Find your local chapter

Regional Chairs

Istanbul
Sima Baktas *sima.baktas@fibree.org*

Country Facts

Source: Wikipedia

Ankara
Capital

83,614,362
Population

Turkish Lira
Currency

Turkish
Language

$794.530 billion
GDP

FIBREE Facts

June 2020
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Avalanche (AVAX)***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» *47*

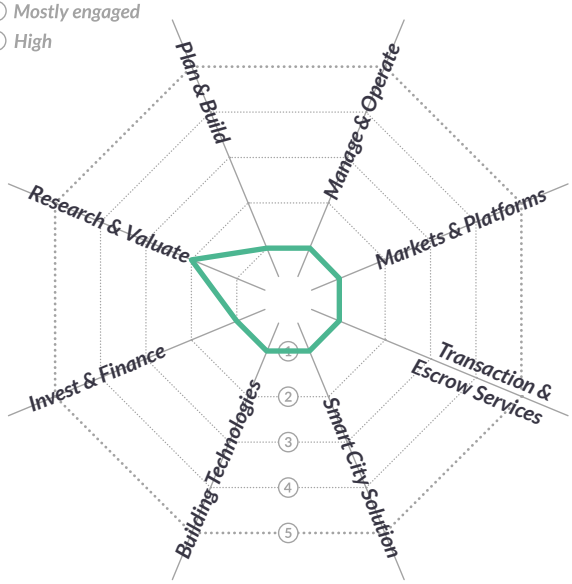
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

Bahcesehir University, Blockchain TURKEY Platform

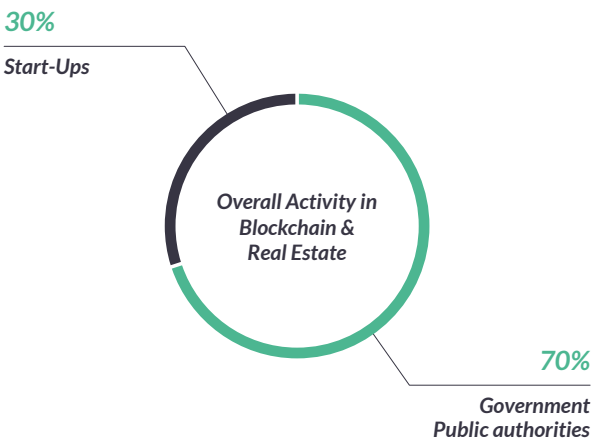
Level of Engagement with Blockchain in Defined Segments

① Low
② Slightly engaged
③ Medium
④ Mostly engaged
⑤ High



2021
2020

Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

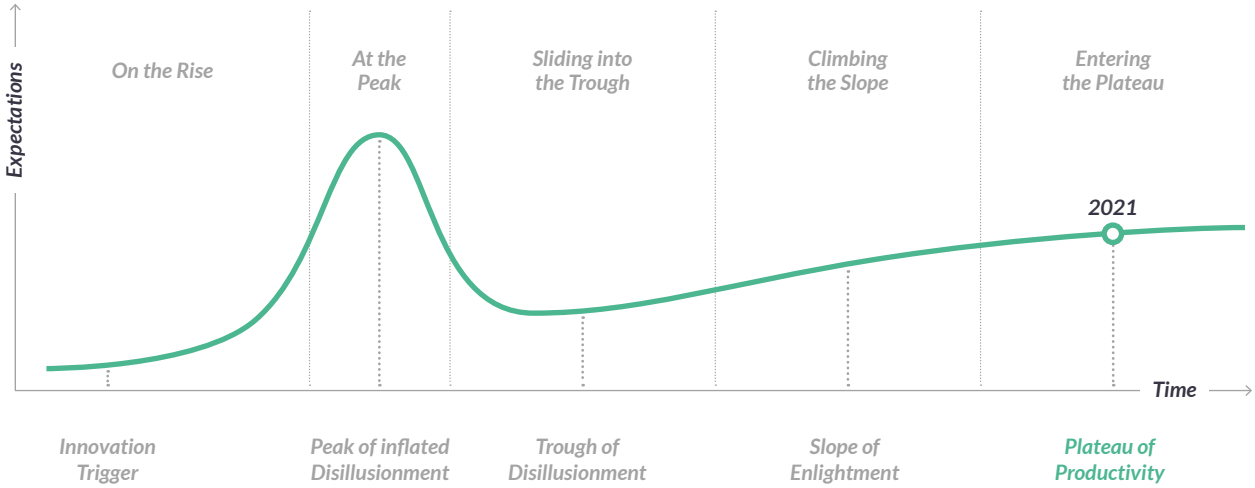
	2019	2020	2021
Number of products	3	0	1
Global ranking	#25	-	#40

Product Database by Segment

Active products 2021 and change directions since 2020.

1 ↗
Markets & Platforms

Gartner Hype Cycle



Uganda

Country Map

Find your local chapter

Regional Chairs

Kampala
Ronald Kaweesi *ronald.kaweesi@fibree.org*

Country Facts

Source: Wikipedia

Kampala
Capital

42,729,036
Population

Ugandan Shilling
Currency

English, Swahili
Language

$30.765 billion
GDP

FIBREE Facts

August 2019
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Hyperledger***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

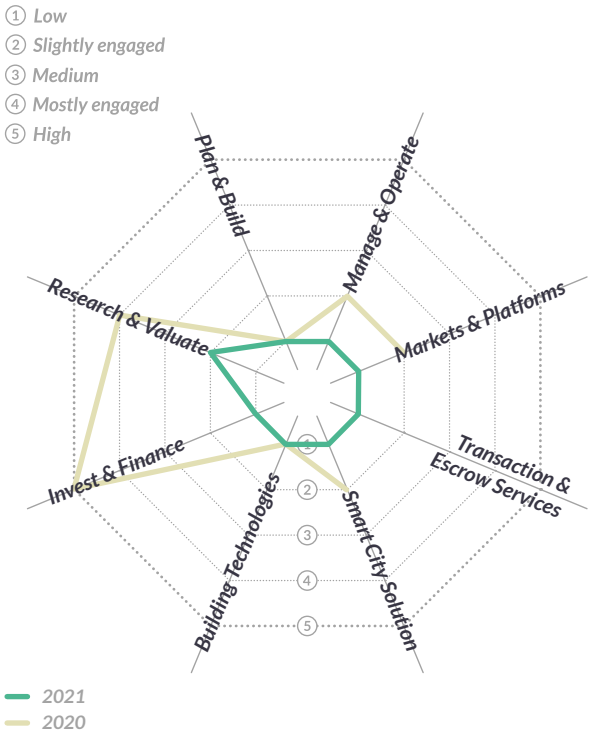
» *9*

Research on Blockchain and Real Estate

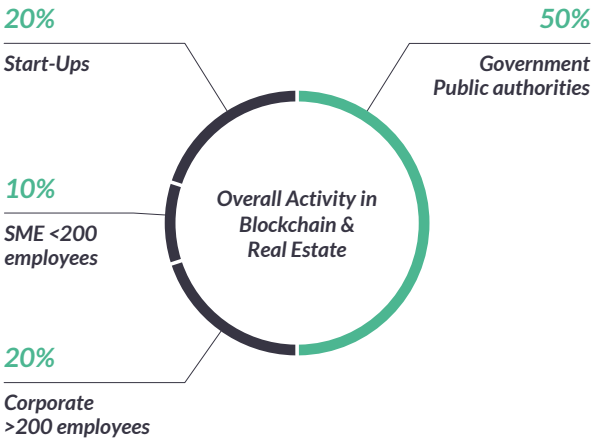
Universities and education programs in the field of blockchain and real estate.

Makerere University

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

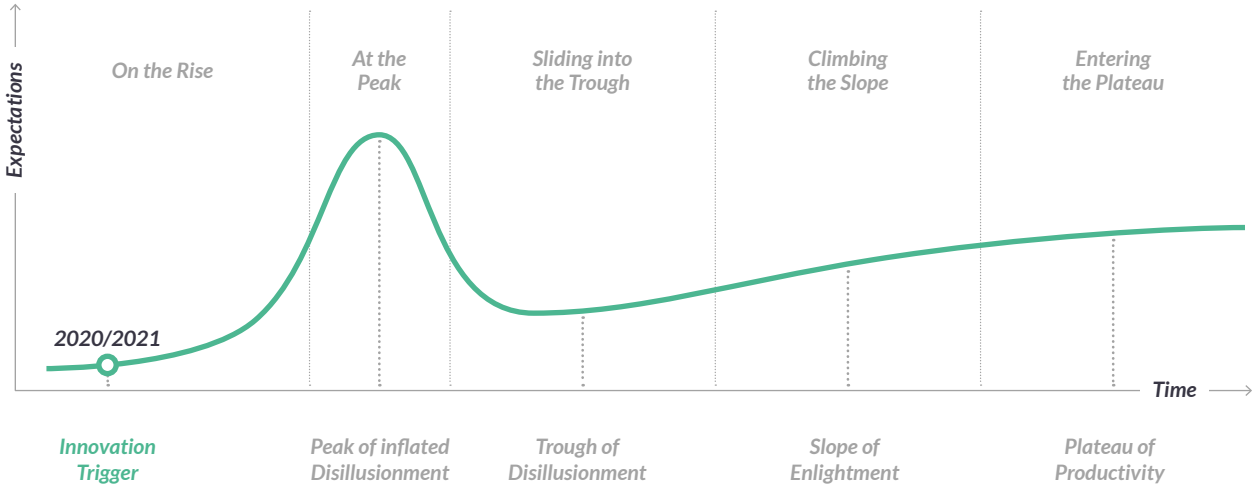
	2019	2020	2021
Number of products	0	2	1
Global ranking	-	#28	#40

Product Database by Segment

Active products 2021 and change directions since 2020.

1 →
Building Technologies

Gartner Hype Cycle



United Arab Emirates

Country Map

Find your local chapter

Regional Chairs

Dubai
Makram Hani makram.hani@fibree.org

Country Facts

Source: Wikipedia

Abu Dhabi
Capital

9,890,400
Population

UAE Dirham
Currency

Arabic
Language

$353.899 billion
GDP

FIBREE Facts

March 2021
First chapter

< 50
Size of community

1
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» **Ethereum**

Readiness by Financial Authorities to Accept Blockchain Applications

» **Open, but not there yet**

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

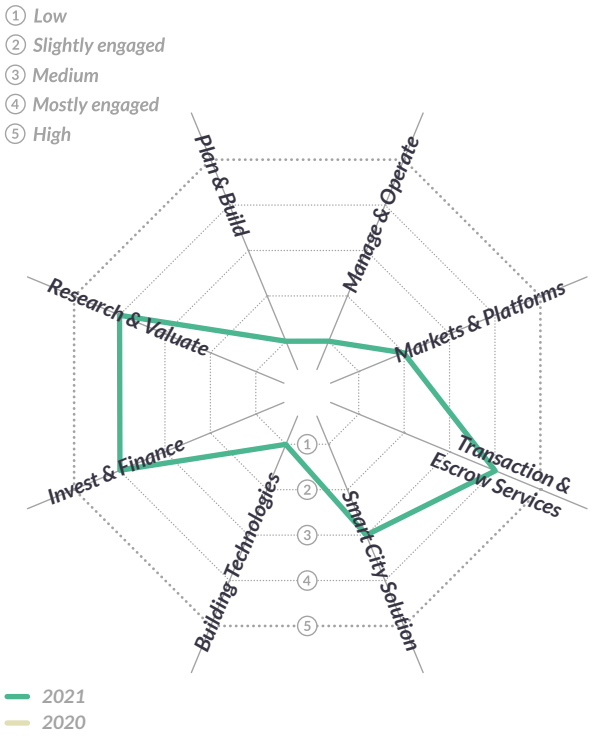
» **27**

Research on Blockchain and Real Estate

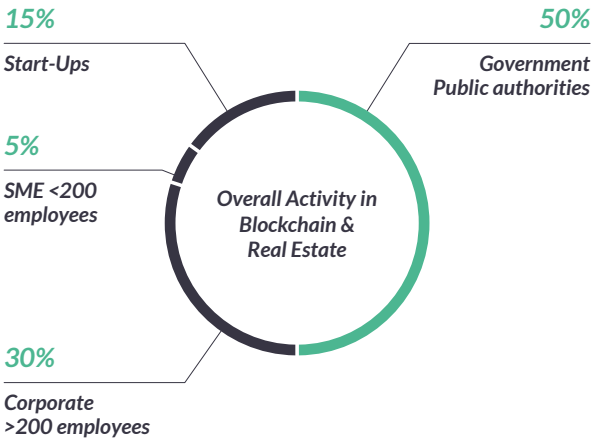
Universities and education programs in the field of blockchain and real estate.

Amity University

Level of Engagement with Blockchain in Defined Segments



Sector Activity



Product Database Keyfigures

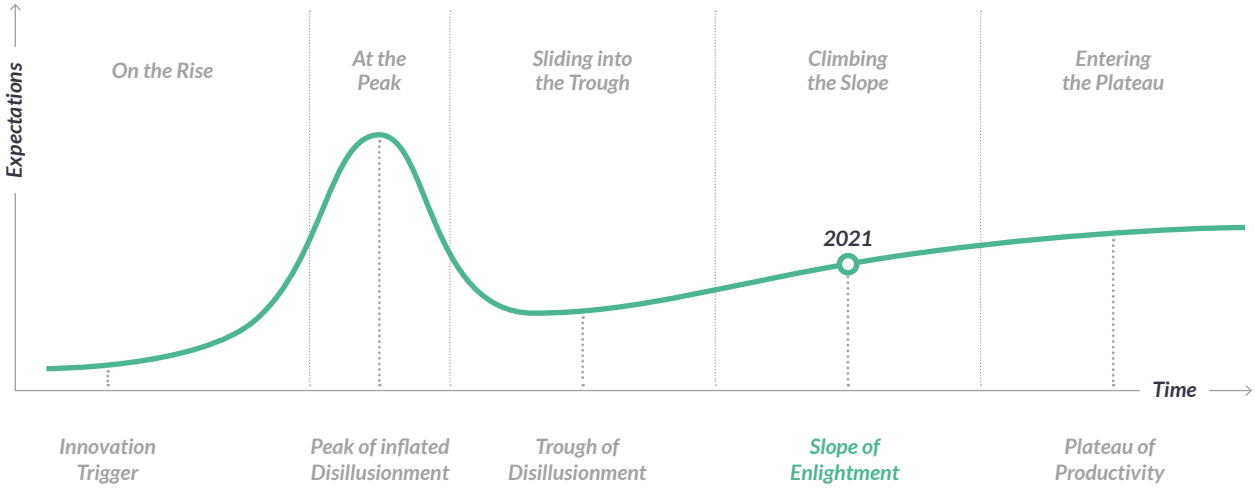
Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

	2019	2020	2021
Number of products	17	3	3
Global ranking	#8	#17	#23

Product Database by Segment

Active products 2021 and change directions since 2020.

Gartner Hype Cycle



United Arab Emirates

United Kingdom

Country Map

Find your local chapter

Regional Chairs

London
Irina Karagyaur *irina.karagyaur@fibree.org*
Jeremy Barnett *jeremy.barnett@fibree.org*
Kevin O'Grady *kevin.ogrady@fibree.org*

Country Facts

Source: Wikipedia

London
Capital

67,886,004
Population

Pound Sterling
Currency

English
Language

$3.124 trillion
GDP

FIBREE Facts

May 2019
First chapter

> 1000
Size of community

3
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	**Partly digital, but mostly paperbased**	Mostly digital	100% digital

Most Used Technology for Blockchain Applications

» ***Ethereum***

Readiness by Financial Authorities to Accept Blockchain Applications

» ***Open, but not there yet***

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

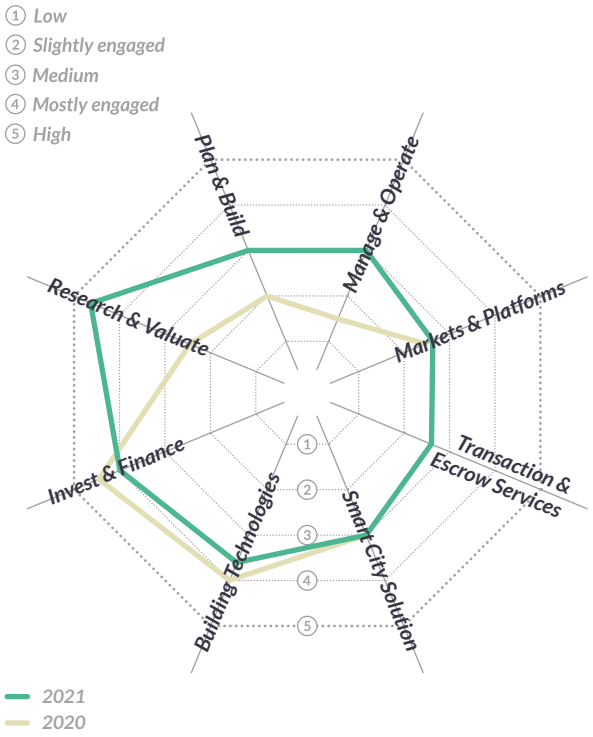
» ***569***

Research on Blockchain and Real Estate

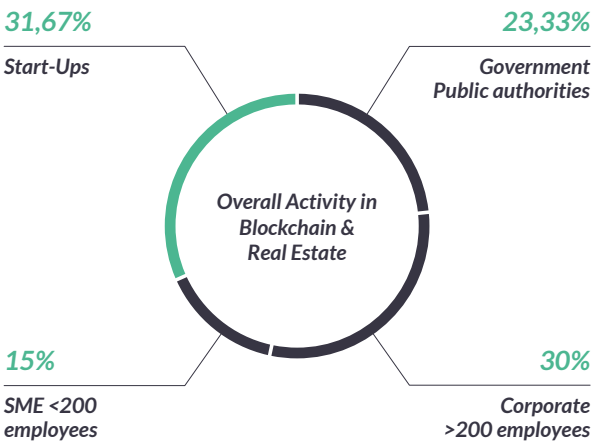
Universities and education programs in the field of blockchain and real estate.

Cardiff and Cambridge, UCL

Level of Engagement with Blockchain in Defined Segments



Sector Activity



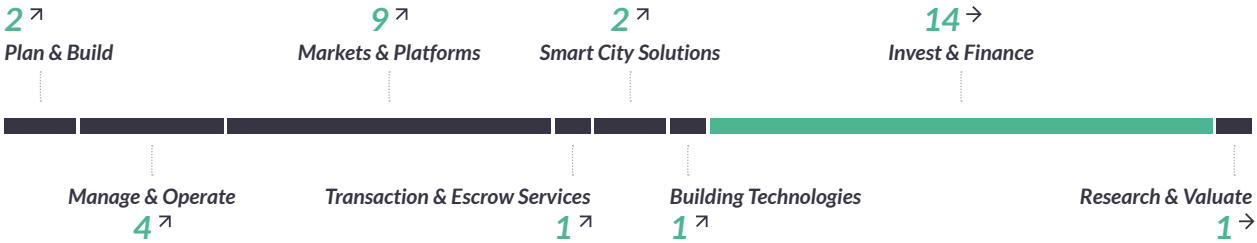
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

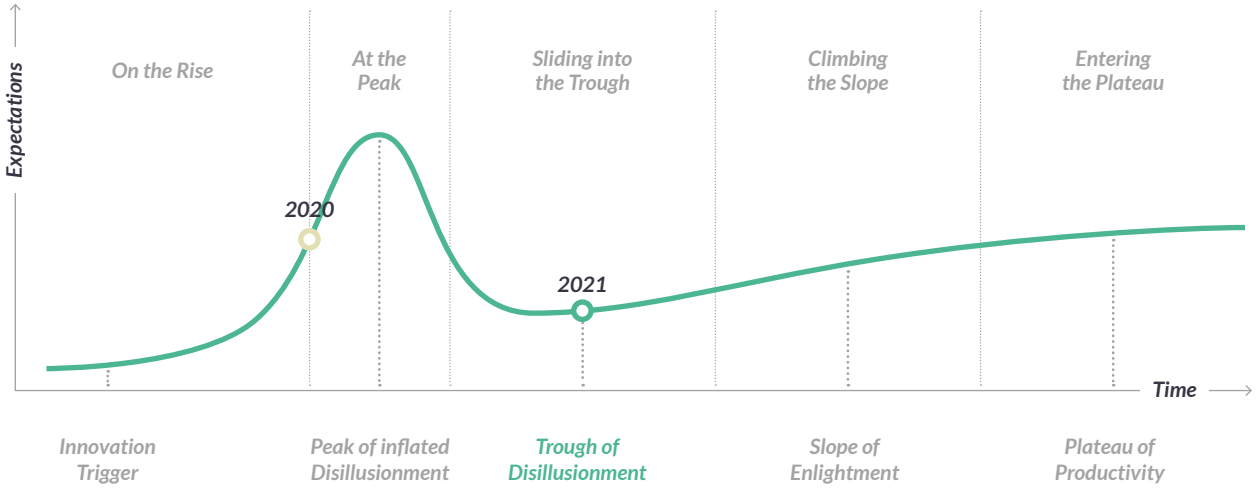
	2019	2020	2021
Number of products	53	23	34
Global ranking	#2	#2	#2

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



United Kingdom

USA

Country Map

Regional Chairs

- **Boston**
  Paul Ferreira paul.ferreira@fibree.org
- **Chicago**
  Geoffrey Kasselman geoffrey.kasselman@fibree.org
- **Dallas**
  Chris Deans chris.deans@fibree.org
  Lee Bratcher lee.bratcher@fibree.org
- **Denver**
  Garratt Hasenstab garratt.hasenstab@fibree.org
- **Houston**
  Mark Kingston mark.kingston@fibree.org
  Sachin Kapoor sachin.kapoor@fibree.org
- **Los Angeles**
  Eric Bryant eric.bryant@fibree.org
- **Miami**
  John Dean Markunas john.dean.markunas@fibree.org
- **New York**
  Bill Staniford bill.staniford@fibree.org
- **Pasadena**
  Ken Rhinehart ken.rhinehart@fibree.org
- **Philadelphia**
  Gary Brandeis gary.brandeis@fibree.org
- **Phoenix**
  Ian Staley ian.staley@fibree.org
- **Salt Lake City**
  Demitri Haddad demitri.haddad@fibree.org
- **San Francisco**
  Ranganathan Krishnan ranganathan.krishnan@fibree.org
- **Seattle**
  Brock Freeman brock.freeman@fibree.org
- **Silicon Valley**
  Peter Su peter.su@fibree.org
- **Tampa / Saint Petersburg**
  Lori Souza lori.souza@fibree.org
- **Washington D.C.**
  Todd Miller todd.miller@fibree.org

Country Facts

Source: Wikipedia

Washington
Capital

331.449.281
Population

United States Dollar
Currency

English
Language

$21,4 trillion
GDP

FIBREE Facts

October 2018
First chapter

> 1000
Size of community

19
Regional chairs

Analog to Digital

How far the country is moving from paper-based business to a digital economy in the real estate industry.

Still mostly paperbased	Partly digital, but mostly paperbased	**Mostly digital**	100% digital

Most Used Technology for Blockchain Applications

» *Ethereum, Hyperledger, Bitcoin*

Readiness by Financial Authorities to Accept Blockchain Applications

» *Open, but not there yet*

Investors Overview

Total number of investors with focus on early-stage, blockchain, prop-tech and crypto related start-ups.

» *2110*

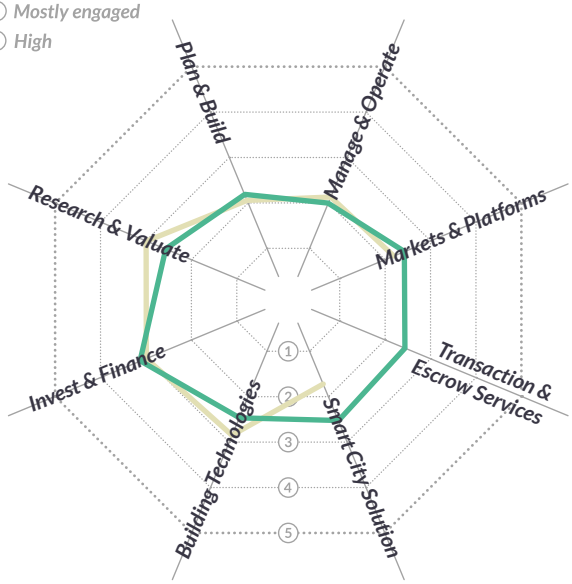
Research on Blockchain and Real Estate

Universities and education programs in the field of blockchain and real estate.

MIT, U.C. U.C. Berkeley, Harvard, Stanford University, Oxford, California Institute of Technology (Cal Tech); University of Southern California (USC), University of Arizona,University of Colorado at Boulder, Columbia, NYU, University Of Illinois, George Mason University, Georgetown University, Johns Hopkins University, Brigham Young University, University of Utah, Utah Valley University, University of Texas Dallas, University of Miami, State of Ohio, Cornell University, Cornell NY, UC Irvine, USC, UCLA

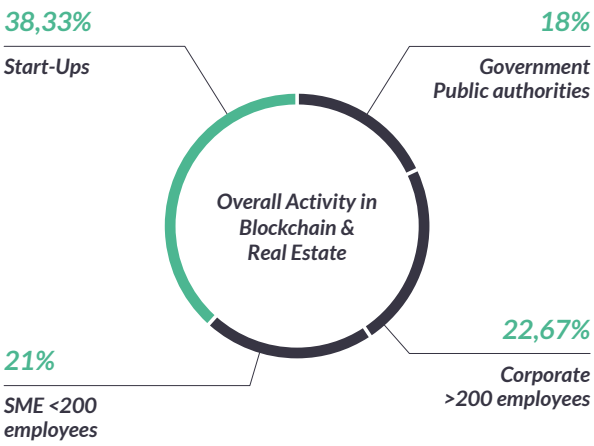
Level of Engagement with Blockchain in Defined Segments

① Low
② Slightly engaged
③ Medium
④ Mostly engaged
⑤ High



2021
2020

Sector Activity



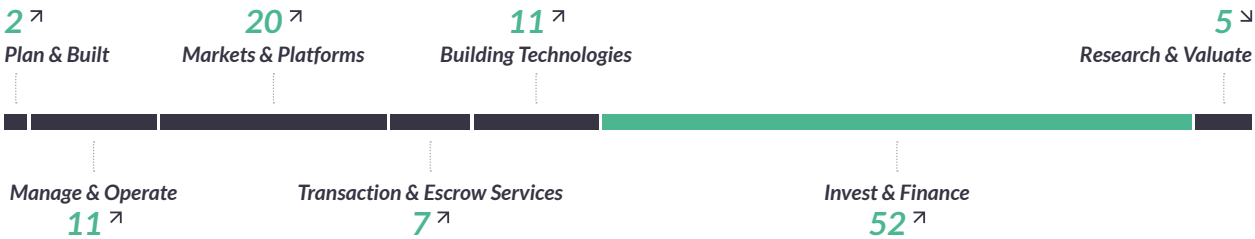
Product Database Keyfigures

Active products due to desktop research and input by regional chairs and FIBREE representatives in this country. Ranking according to globally available products.

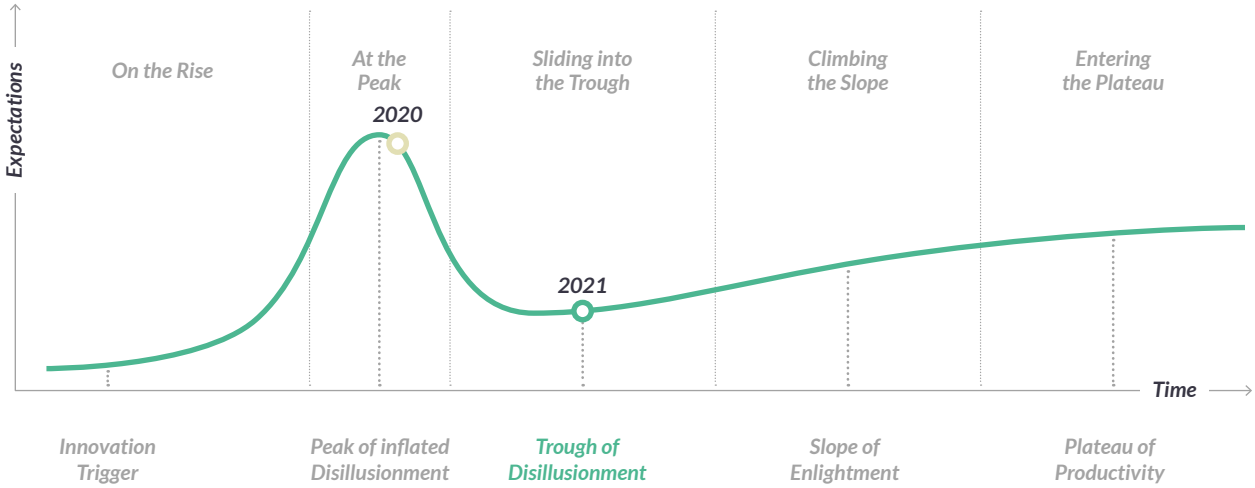
	2019	2020	2021
Number of products	125	69	108
Global ranking	1	1	1

Product Database by Segment

Active products 2021 and change directions since 2020.



Gartner Hype Cycle



Product Database

This product database was created by a FIBREE working group mainly based on desktop research (see page 34). Products that were public available by 15 June 2021 have been recognized to the best of our effort. As the industry is constantly changing this can only be a snapshot and has no claim to be complete. So please be aware that some of the products listed, might in the period in between have ceased their activities. Via the FIBREE website you can add products / startups to this database or let us know in case projects that are listed here ceased meanwhile. Highlighted products are supporting FIBREE as a featured company.

Want to be found in the haystack? Have a look on how to become a FIBREE supporter as featured company on our website: fibree.org/advertise

Brand	Focus	City	Country	Entry point	FIBREE Growth Stages	Website
Crowdium	**Invest & Finance**	**Buenos Aires**	**Argentina**	**BC > RE**	**3**	**crowdium.com**
Avestix	Invest & Finance	Brisbane	Australia	RE > BC	3	avestix.com
Benext	Transaction & Escrow Services	Melbourne	Australia	BC > RE	1	benext.io
Bricklet	Invest & Finance	Manly	Australia	BC > RE	-	bricklet.com.au
BuildSort	**Plan & Build**	**Perth**	**Australia**	**50/50**	**1**	**buildsort.com**
Contracoin	Markets & Platforms	Southport	Australia	BC > RE	-	contracoin.network
Deedcoin	Invest & Finance	Melbourne	Australia	BC > RE	-	deedcoinlaunch.com
EnergyStorageRights	Manage & Operate	Canberra	Australia	50/50	1	energystoragerights.com
Fractonium	Invest & Finance	Sydney	Australia	BC > RE	-	fractonium.com
GiFang	Invest & Finance	Sydney	Australia	RE > BC	3	gifang.com
GREIT	Invest & Finance	Sydney	Australia	BC > RE	2	greit.io
Hutly	Markets & Platforms	Brisbane	Australia	50/50	3	hutly.com
iContract Technologies	**Building Technologies**	**Sydney**	**Australia**	**BC > RE**	**1**	**icontract.ai**
Konkrete	Invest & Finance	Melbourne	Australia	BC > RE	1	konkrete.io
Liquid Token	Invest & Finance	Melbourne	Australia	BC > RE	-	liquidtoken.net
Locihub	Markets & Platforms	Brisbane	Australia	BC > RE	2	ocihub.com
MNotes	Invest & Finance	Sydney	Australia	BC > RE	3	mnotes.online
Piptle	Invest & Finance	Brisbane	Australia	BC > RE	1	piptle.com
Powerledger	Building Technologies	Perth	Australia	BC > RE	3	powerledger.io
Propoty	Invest & Finance	Melbourne	Australia	BC > RE	2	propoty.com
Serenity Source	Building Technologies	Narrabeen	Australia	BC > RE	1	serenitysource.com.au
Tokenized	Invest & Finance	Canberra	Australia	BC > RE	-	tokenized.com
Black Manta Capital Partners	Invest & Finance	Vienna	Austria	BC > RE	3	blackmanta.capital
Blockchain Consultig	Building Technologies	Graz	Austria	BC > RE	-	blockchain-consulting.io
Brickwise	**Invest & Finance**	**Graz**	**Austria**	**50/50**	**1**	**brickwise.at**
Chris Miess	Invest & Finance	Schwaz	Austria	BC > RE	-	chrismiess.com
Hot City	Smart City Solutions	Vienna	Austria	BC > RE	-	picapipe.com
Obsnetwork	Building Technologies	Vienna	Austria	BC > RE	3	Obsnetwork.com
Riddle&Code	Building Technologies	Vienna	Austria	BC > RE	-	riddle&code.com
Weavs	Building Technologies	Dornbirn	Austria	BC > RE	3	weavs.io
Rise Markets	Invest & Finance	-	Bahamas	50/50	-	risemarkets.io
Dexma	Manage & Operate	Antwerpen	Belgium	RE > BC	3	dexma.com
Settlemint	Markets & Platforms	Leuven	Belgium	BC > RE	3	settlemint.com
Trase	Building Technologies	Hasselt	Belgium	BC > RE	3	trase.be
BlockImob	Markets & Platforms	Sao Paulo	Brazil	50/50	-	blockimob.com.br
Growth Tech	Building Technologies	Rio de Janeiro	Brazil	BC > RE	3	growthtech.com.br

MB Digital Assets	Invest & Finance	Sao Paulo	Brazil	BC > RE	3	mercadobitcoin.com.br
Netspaces	Markets & Platforms	Porto Alegre	Brazil	50/50	1	netspaces.org
One Percent	Invest & Finance	Sao Paulo	Brazil	BC > RE	3	onepercent.io
ReitBz	Invest & Finance	Sao Paulo	Brazil	BC > RE	3	reitbz.io
Toke Invest	Markets & Platforms	Curitiba	Brazil	50/50	-	tokeinvest.com.br
Limechain	Building Technologies	Sofia	Bulgaria	BC > RE	3	limechain.tech
Acreage	Invest & Finance	Toronto	Canada	-	-	acreageway.com
Arextech	Markets & Platforms	Toronto	Canada	BC > RE	3	arex.technology
Atlas One	Invest & Finance	Vancouver	Canada	BC > RE	1	atlasone.ca
Bitcoin Real Estate	Markets & Platforms	Port Alberni	Canada	BC > RE	3	bitcoin-realestate.com
BRED Token	Invest & Finance	Ontario	Canada	-	-	bredtoken.com
Chelle Coin	Invest & Finance	Mississauga	Canada	-	-	chellecoin.com
Coinvestion Technologies Inc.	Invest & Finance	Vancouver	Canada	BC > RE	2	coinvestion.com
GeoClique	Invest & Finance	Montreal	Canada	BC > RE	1	welcome.geoclique.com
Honestdoor	Markets & Platforms	Edmonton	Canada	RE > BC	3	honestdoor.com
Infiblocks Technologies Inc	Manage & Operate	Toronto	Canada	RE > BC	1	infiblocks.com
International Deal Gateway	Markets & Platforms	Vancouver	Canada	50/50	-	dealgateway.com
Metavest	Invest & Finance	Toronto	Canada	BC > RE	1	metavest.io
Nobul	Markets & Platforms	Toronto	Canada	-	-	nobul.com
ProximaX	Markets & Platforms	Vancouver	Canada	-	-	proximax.io
RealShare	Invest & Finance	Calgary	Canada	-	-	yourealshare.com
Reitium	Markets & Platforms	Vancouver	Canada	BC > RE	3	reitium.com
Sold solutions	Transaction & Escrow Services	Toronto	Canada	BC > RE	-	soldwallet.com
Tokenfunder	Invest & Finance	Toronto	Canada	BC > RE	3	tokenfunder.com
XR Web	Markets & Platforms	Toronto	Canada	BC > RE	3	xrweb.network
Zooky	Markets & Platforms	Vancouver	Canada	RE > BC	3	zooky.ca
Evareium	Invest & Finance	George Town	Cayman Islands	-	-	evareium.io
Brix International Limited	Invest & Finance	Hong Kong	China	-	-	brix.international
Chaintech	Markets & Platforms	Beijing	China	50/50	3	cchaintech.com
Conflux Network	Building Technologies	Changsha	China	BC > RE	3	confluxnetwork.org
Cybereits	Invest & Finance	Hong Kong	China	-	-	cybereits.com
E-House	Transaction & Escrow Services	Shanghai	China	RE > BC	3	eju.com
EBaas	Building Technologies	Shanghai	China	BC > RE	3	ebaas.com
IHT	Markets & Platforms	Shanghai	China	BC > RE	-	ihtcoin.com
iReam	Invest & Finance	Shanghai	China	-	-	iream.club
Rocktree Capital	Markets & Platforms	Beijing	China	BC > RE	3	rocktreecapital.com
Uprets	Invest & Finance	Beijing	China	-	-	uprets.io
VastChain	Building Technologies	Hang Zhou	China	BC > RE	3	vastchain.cn
Wealthe Coin	Invest & Finance	Shanghai	China	BC > RE	3	wealthe.io
Cityzeen	**Smart City Solutions**	**Bogota**	**Colombia**	**RE > BC**	**1**	**cityzeen.co**
Blocknify	Building Technologies	Prague	Czech Republic	BC > RE	2	blocknify.com
Brikkapp	Markets & Platforms	Prague	Czech Republic	50/50	1	Brikkapp.com

DigiShares	**Invest & Finance**	**Aalborg**	**Denmark**	**BC > RE**	**3**	**digishares.io**
Suscribo	**Transaction & Escrow Services**	**Guayas**	**Ecuador**	**BC > RE**	**3**	**suscribo.com**
BitOfProperty	Markets & Platforms	Tallinn	Estonia	RE > BC	1	bitofproperty.com
United Token	Invest & Finance	Tallinn	Estonia	BC > RE	1	unitedtoken.eu
W2B.IO	Invest & Finance	Tallinn	Estonia	-	-	w2b.io
DIAS	Invest & Finance	Helsinki	Finland	BC > RE	-	dias.fi
Empirica	Building Technologies	Turku	Finland	BC > RE	-	empirica.fi
Realstocks	Invest & Finance	Helsinki	Finland	50/50	-	realstocks.io
Tomorrow Tech	Building Technologies	Helsinki	Finland	BC > RE	-	tomorrow.fi
Olarchy	Markets & Platforms	Paris	France	RE > BC	-	olarchy.com
Apato	Invest & Finance	Berlin	Germany	-	-	apato.company
Bloxxter	Invest & Finance	Hamburg	Germany	50/50	1	bloxxter.com
Datarella	Building Technologies	Munich	Germany	BC > RE	3	datarella.com
Domi	Research & Valuate	Berlin	Germany	50/50	1	domilabs.io
Finexity AG	**Invest & Finance**	**Hamburg**	**Germany**	**BC > RE**	**3**	**finexity.com**
Fundament	Invest & Finance	Hamburg	Germany	-	-	fnd.group
INFINITE	Manage & Operate	Munich	Germany	BC > RE	1	infinite.de
KlickOwn AG	Invest & Finance	Hamburg	Germany	RE > BC	1	klickown.com
Micobo	Building Technologies	Frankfurt am Main	Germany	BC > RE	3	micobo.com
OLI Systems	Manage & Operate	Stuttgart	Germany	BC > RE	3	my-oli.com
UBIRCH	Building Technologies	Cologne	Germany	BC > RE	3	ubirch.com
Bitland	Smart City Solutions	Kumasi	Ghana	50/50	1	bitlandghana.org
Zilios	Building Technologies	Gibraltar	Gibraltar	50/50	1	zillios.io
LVE	Building Technologies	-	Greece	-	-	lveblockchain.org
Realchain	Invest & Finance	Athens	Greece	-	-	fós.com/realchainp.c
LABS Group	Invest & Finance	Hong Kong	Hong Kong	50/50	1	labsgroup.io
Liquefy	Invest & Finance	Hong Kong	Hong Kong	50/50	1	liquefy.com
Mai blocks	Invest & Finance	Hong Kong	Hong Kong	50/50	1	maiblocks.com
Riodefi	Building Technologies	Hong Kong	Hong Kong	BC > RE	2	riodefi.com
eHaz	Manage & Operate	Budapest	Hungary	RE > BC	-	ehaz.hu
SmartDeposit	Invest & Finance	Budapest	Hungary	BC > RE	1	smartdeposit.hu
CoBuy	Invest & Finance	Pune	India	50/50	1	
Definite	Invest & Finance	Delhi	India	50/50	3	definite.re
hBits	Invest & Finance	Mumbai	India	50/50	3	hbits.co
Minddeft	Building Technologies	Ahmedabad	India	BC > RE	2	minddeft.com
Property Share	Invest & Finance	Bangalore	India	50/50	1	propertyshare.in
prosares	Transaction & Escrow Services	Mumbai	India	RE > BC	3	prosares.com
Snapperfuturetech	**Markets & Platforms**	**Pune**	**India**	**BC > RE**	**1**	**snapperfuturetech.com**
StarProp	Invest & Finance	Pune	India	50/50	3	strataprop.com
I-Pro Token	Invest & Finance		Indonesia	BC > RE	1	i-protoken.com

Triumland	Invest & Finance	Bitung	Indonesia	RE > BC	1	triumland.com
BidX1	Invest & Finance	Dublin	Ireland	RE > BC	3	bidxcom
CasaCrowd	Invest & Finance	Dublin	Ireland	BC > RE	1	casacrowd.com
Geowox	Invest & Finance	Dublin	Ireland	50/50	1	geowox.com
Spry Finance	Invest & Finance	Dublin	Ireland	50/50	2	spryfinance.ie
Brikoin	Invest & Finance	Tel Aviv	Israel	50/50	2	brikoin.com
Everflow	Invest & Finance	Tel Aviv	Israel	-	-	everflow.global
Inveniam	Building Technologies	-	Israel	-	3	inveniam-group.com
Solidblock	**Markets & Platforms**	**Tel Aviv**	**Israel**	**BC > RE**	**3**	**solidblock.co**
Acca	Transaction & Escrow Services	Napoli	Italy	BC > RE	-	acca.it
Affidaty	Building technologies	Firenze	Italy	BC > RE	2	affidaty.io
Alyon	Invest & Finance	Verona	Italy	50/50	1	alyon.co
Bcademy	**Transaction & Escrow Services**	**Pordenone**	**Italy**	**RE > BC**	**2**	**bcademy.it**
Brickoin	Invest & Finance	Milano	Italy	50/50	1	brickoin.com
CASAVO	Markets & Platforms	Milano	italy	RE > BC	3	casavo.com/it
Ekobonus	Invest & Finance	Padova	Italy	50/50	2	ekobonus.com
HomePanda	Markets & Platforms	Milano	italy	50/50	3	homepanda.it
Mybrix	Invest & Finance	Rome	Italy	RE > BC	-	mybrix.it
Realhouse	Invest & Finance	Milano	Italy	50/50	-	realhouse.io
Rechain	Plan & Build	Milano	Italy	50/50	1	rechain.it
REDD	Research & Valuate	Rome	Italy	50/50	1	realestatedocumentsdata.com
RElabs	**Manage & Operate**	**Rome**	**Italy**	**BC > RE**	**1**	**relabs.it**
Reply S.p.A.	Transaction & Escrow Services	Torino	Italy	50/50	3	reply.com
Scrypta	Building technologies	Firenze	Italy	BC > RE	-	scrypta.foundation
Trusters	Invest & Finance	Milano	Italy	50/50	2	trusters.it
WIZKEY	Invest & Finance	Milano	italy	BC > RE	2	wizkey.io
Zwei Space	Building Technologies	Tokyo	Japan	50/50	2	zweispace.co.jp
Land Layby	Invest & Finance	Nairobi	Kenya	50/50	-	hrbe.io
Ubricoin	Invest & Finance	Nairobi	Kenya	BC > RE	1	ubricoin.com
CROWDLITOKEN AG	Invest & Finance	Triesen	Liechtenstein	50/50	2	crowdlitoken.com
Stone coin	Invest & Finance	Triesen	Liechtenstein	50/50	2	thestonecoin.com
World Opo	Invest & Finance	Triesen	Liechtenstein	50/50	2	worldopo.io
Eliacin	Invest & Finance	Luxembourg	Luxembourg	BC > RE	3	eliacin.lu
Estate Share	Invest & Finance	Luxembourg	Luxembourg	50/50	1	estateshare.eu
Housetoken	Invest & Finance	Luxembourg	Luxembourg	RE > BC	1	housetoken.io
Niu Group	Building Technologies	Luxembourg	Luxembourg	BC > RE	3	niugroup.lu
STOKR	Markets & Platforms	Luxembourg	Luxembourg	BC > RE	2	stokr.io
Tokeny	Building Technologies	Luxembourg	Luxembourg	BC > RE	2	tokeny.com
Scarlett invest	Invest & Finance	Penang	Malaysia	50/50	1	scarlettinvest.com
REX	Markets & Platforms	-	Malta	RE > BC	-	rexhomes.com
Tokenomica	Markets & Platforms	San Gwann	Malta	RE > BC	1	tokenomica.com
Kauri	Markets & Platforms	-	Marshall Islands	50/50	2	kauricrypto.com

101ladrillos	Invest & Finance	Guadalajara	Mexico	50/50	3	100ladrillos.com
Mexenova	**Markets & Platforms**	**San Miguel de Allende**	**Mexico**	**RE > BC**	**2**	**mexenova.com**
Mountx	**Markets & Platforms**	**Mexico City**	**Mexico**	**RE > BC**	**2**	**mountx.io**
Ofertare	Markets & Platforms	Mexico City	Mexico	RE > BC	3	ofertare.com
Blandlord	Markets & Platforms	Rotterdam	Netherlands	50/50	2	blandlord.com
Blockmaterials	Plan & Build	Heerlen	Netherlands	RE > BC	2	blockmaterials.com
Bloqhouse	Invest & Finance	Amsterdam	Netherlands	50/50	3	bloqhouse.com
Blyver	**Invest & Finance**	**Rotterdam**	**Netherlands**	**BC > RE**	**1**	**blyver.com**
Empowa	Invest & Finance	The Hague	Netherlands	50/50	1	empowa.io
Fundum Capital	Invest & Finance	Amsterdam	Netherlands	50/50	-	fundum.capital
Kate Innovations	Markets & Platforms	Utrecht	Netherlands	RE > BC	3	kateinnovations.com
Loek!	Markets & Platforms	The Hague	Netherlands	RE > BC	3	loekonline.nl
LTO Network	**Building Technologies**	**Amsterdam**	**Netherlands**	**BC > RE**	**3**	**ltonetwork.com**
Max Property Group B.V.	**Invest & Finance**	**Rotterdam**	**Netherlands**	**RE > BC**	**3**	**maxpropertygroup.com**
ReCheck	Markets & Platforms	Heerlen	Netherlands	BC > RE	3	recheck.io
Synopsis	**Invest & Finance**	**Amsterdam**	**Netherlands**	**RE > BC**	**1**	**synopsis.capital**
BAM Tecnology	Building Technologies	Lagos	Nigeria	BC > RE	2	blockchainmgt.com
Hilton top Solicitor	Transaction & Escrow Services	Lagos	Nigeria	RE > BC	3	hiltontopsolicitors.com
Justin Okpu & Co. Ltd.	Research & Valuate	Abuja	Nigeria	-	-	justinokpuandco.wordpress.com
PropVat	Invest & Finance	Abuja	Nigeria	50/50	2	propvat.com
Aqwire	Markets & Platforms	Manila	Philippines	50/50	3	aqwire.io
Cestates	Markets & Platforms	Manila	Philippines	50/50	2	cestates.io
Quickwire Inc.	Building Technologies	Manila	Philippines	BC > RE	2	qwikwire.com
CCUniverse	Building Technologies	Warsaw	Poland	50/50	-	ccuniverse.org
Exea Smart Space	Transaction & Escrow Services	Warsaw	Poland	50/50	3	smartspace.io
FCQ Platform	Markets & Platforms	Lublin	Poland	50/50	2	fcqplatform.com
Pracownia Finansowa	Markets & Platforms	Warsaw	Poland	RE > BC	3	pracownia-finansowa.pl
SonarHome	Markets & Platforms	Warsaw	Poland	RE > BC	3	sonarhome.pl
Next Reality	Building Technologies	Lisbon	Portugal	50/50	3	nextreality.com
Smart Deed	Transaction & Escrow Services	Lisbon	Portugal	50/50	1	-
In Portal	Markets & Platforms	San Juan	Puerto Rico	50/50	2	inportalusa.com
Squarex PLatform	Building Technologies	Moscow	Russia	50/50	1	squarex.io
Universal Blockchain	Smart City Solutions	-	Russia	50/50	2	universablockchain.com
Waves Enterprise	Building Technologies	-	Russia	BC > RE	3	wavesenterprise.com
Avrio BC	Invest & Finance	Jeddah	Saudi Arabia	50/50	2	avrioinvest.com
Quara Holding	Invest & Finance	Ryad	Saudi Arabia	50/50	1	quaraholding.com

BIMPROQR	Plan & Build	Singapore	Singapore	RE > BC	2	bimproqr.com
BlockCrowd	Markets & Platforms	Singapore	Singapore	50/50	1	blockcrowd.io
Chintai	Invest & Finance	Singapore	Singapore	50/50	1	chintai.io
Comm X	Markets & Platforms	Singapore	Singapore	50/50	2	commx.io
Fraxtor	**Invest & Finance**	**Singapore**	**Singapore**	**RE > BC**	**2**	**fraxtor.com**
iatokens	Markets & Platforms	Singapore	Singapore	50/50	1	iatokens.com
Investax	Markets & Platforms	Singapore	Singapore	-	-	investax.io
Moonwhale	Building Technologies	Singapore	Singapore	-	-	moonwhale.io
Real estate DOC	Markets & Platforms	Singapore	Singapore	50/50	1	realestatedoc.co
SDAX	Invest & Finance	Singapore	Singapore	RE > BC	2	sdax.co
Shareable assets	Markets & Platforms	Singapore	Singapore	RE > BC	2	shareableasset.com
Spazio NOON	Plan & Build	Singapore	Singapore	RE > BC	2	noon.sg
STIE	Building Technologies	Singapore	Singapore	RE > BC	3	stie.com.sg
TUU	Research & Valuate	Singapore	Singapore	50/50	1	tuu.eco
Twin Capital	Invest & Finance	Singapore	Singapore	BC > RE	1	twincapital.com
Zwei Space	Markets & Platforms	Singapore	Singapore	50/50	2	zweispace.co.jp
SIMMST	Building Technologies	Piestany	Slovakia	50/50	1	simmst.de
Blocksquare	**Invest & Finance**	**Ljubljana**	**Slovenia**	**BC > RE**	**2**	**blocksquare.io**
Elements Estates	Invest & Finance	Ljubljana	Slovenia	50/50	1	elementsestates.io
Bitprop	Invest & Finance	Cape Town	South-Africa	-	-	bitprop.com
Kasa	Markets & Platforms	Seoul	South-Korea	50/50	2	kasa.co.kr
Mossland	Invest & Finance	Seoul	South-Korea	BC > RE	1	moss.land
TUTI.FUND	Invest & Finance	Barcelona	Spain	50/50	1	tuti.fund
Bionm	Plan & Build	Madrid	Spain	RE > BC	1	bionm.es
Brickken	**Invest & Finance**	**Barcelona**	**Spain**	**BC > RE**	**3**	**brickken.com**
Deed	Markets & Platforms	Malaga	Spain	RE > BC	-	deedspain.com
Dyvare	Markets & Platforms	Almeria	Spain	50/50	1	dyvare.com
Housers	Invest & Finance	Madrid	Spain	RE > BC	3	housers.com
RealFund	Invest & Finance	Madrid	Spain	BC > RE	2	realfund.tech
RentalT	Transaction & Escrow Services	Madrid	Spain	50/50	-	rentalt.co
Tokeniza	**Research & Valuate**	**Madrid**	**Spain**	**BC > RE**	**1**	**tokeniza.es**
Transfertrade	Building Technologies	Castellón de la Plana	Spain	BC > RE	1	transfertrade.com
Vicente Ortiz&Co	Markets & Platforms	Marbella	Spain	BC > RE	1	vicenteortizabogados.com
ChromaWay	Building Technologies	Stockholm	Sweden	50/50	2	chromaway.com
AdNovum	Building Technologies	Zurich	Switzerland	-	1	adnovum.ch
Algotecture	Research & Valuate	Zurich	Switzerland	-	1	algotecture.github.io
Blockimmo	Markets & Platforms	Zug	Switzerland	-	1	blockimmo.ch
BlockState	Markets & Platforms	Zug	Switzerland	-	1	blockstate.com
Brickmark AG	Invest & Finance	Zug	Switzerland	-	1	brickmark.net
Casa Real Estate AG	Invest & Finance	Trogen	Switzerland	-	1	casarealestate.ch

Consensys	Building Technologies	Zug	Switzerland	-	1	consensys.net
Crowdlitoken	Invest & Finance	Zurich	Switzerland	RE > BC	3	crowdlitoken.com
element36	Building Technologies	Zug	Switzerland	BC > RE	3	element36.io
Idoneus	Invest & Finance	Zug	Switzerland	RE > BC	1	idoneus.io
Swiss-Crowd	Building Technologies	Lugano	Switzerland	-	1	swiss-crowd.com
Token Factory	Building Technologies	Zug	Switzerland	-	1	tokenfactory.global
Tokenestate	Invest & Finance	Geneva	Switzerland	-	1	tokenestate.io
NOON Property Management	Plan & Build	Phuket	Thailand	RE > BC	1	noon.sg
Sharkaroo	Building Technologies	Bangkok	Thailand	RE > BC	2	sharkaroo.io
GABORAS	Markets & Platforms	□stanbul	Turkey	-	-	gaboras.com.tr
Chiragh	Markets & Platforms	Dubai	UAE	50/50	2	chiragh.com
GRIP Investments	Invest & Finance	Dubai	UAE	50/50	-	grip.investments
SmartCrowd	Markets & Platforms	Dubai	UAE	50/50	1	smartcrowd.ae
Crypto Savannah	Building Technologies	Kampala	Uganda	BC > RE	1	cryptosavannah.com
ATLANT	Markets & Platforms	-	UK	50/50	-	atlant.io
Aztec Protocol	Transaction & Escrow Services	London	UK	BC > RE	-	aztec.network
Bips	Invest & Finance	Cheshire	UK	BC > RE	1	bips.moneybrain.com
Block Estates	Markets & Platforms	London	UK	BC > RE	2	blockestates.io
Blockdeed	Invest & Finance	London	UK	-	-	blockdeed.com
Brikcoin	Invest & Finance	London	UK	-	-	brikcoin.net
Building Innovation Management	**Manage & Operate**	**Farnborough**	**UK**	**BC > RE**	**2**	**buildingim.com**
Click to Purchase	Markets & Platforms	London	UK	RE > BC	3	clicktopurchase.co
Coadjute	Manage & Operate	London	UK	BC > RE	3	coadjute.com
CurveBlock	Invest & Finance	Leeds	UK	BC > RE	2	curveblock.io
Dacx	Markets & Platforms	London	UK	BC > RE	-	dacx.io
ehab	Plan & Build	Norwich	UK	50/50	-	ehab.co
ELAND ATLAS	Smart City Solutions	London	UK	BC > RE	-	elandatlas.com
eLocations	Markets & Platforms	London	UK	50/50	3	elocations.com
Fetch	Smart City Solutions	Cambridge	UK	BC > RE	-	fetch.ai
Global Prop Xchange (GPX)	Markets & Platforms	London	UK	BC > RE	1	gpx-int.co.uk
Helex	Markets & Platforms	London	UK	BC > RE	1	helex.world
Inferium	Invest & Finance	London	UK	BC > RE	1	inferium.co
Leaseum Partners	Invest & Finance	London	UK	BC > RE	-	leaseumpartners.com
Move Estate	Invest & Finance	London	UK	BC > RE	1	moveestate.com
PIF-Propertyinfofile	Manage & Operate	London	UK	BC > RE	1	propertyinfofile.com
RE5Q	Manage & Operate	London	UK	RE > BC	3	www.re5q.com
Red Girraffe	Invest & Finance	London	UK	50/50	3	redgirraffe.com
Resilience Parnters Ltd	Research & Valuate	London	UK	50/50	3	resilience-partners.co.uk
Singer Vielle	Markets & Platforms	London	UK	RE > BC	3	singerviellesales.com
SmartI&s	Invest & Finance	London	UK	BC > RE	-	smartlands.io
Space-iz	Invest & Finance	London	UK	BC > RE	-	space-iz.com
Tag World Exchange	Invest & Finance	London	UK	BC > RE	-	twex.info
Tech Alchemy	Building Technologies	London	UK	BC > RE	-	techalchemy.co
TPX	Invest & Finance	London	UK	RE > BC	-	tpx-london.io
TravelBirdz	Invest & Finance	London	UK	BC > RE	1	travelbirdz.co.uk

Unique Network	Markets & Platforms	London	UK	-	2	uniquenetwork.io
YieldCoin / Liqquid	Invest & Finance	London	UK	BC > RE	1	yieldcoin.io
Zortrex	Manage & Operate	Prestonpans	UK	BC > RE	-	zortrex.com
Illuminates	Building Technologies		Ukraine	50/50	-	illuminates.org
Stobox	Invest & Finance	Kyiv	Ukraine	BC > RE	-	stobox.io
A Real Blockchain Solution	Invest & Finance	Dallas	USA	BC > RE	3	arealblockchainsolution.com
Abstract	Invest & Finance	Seattle	USA	50/50	3	abstracttokenization.com
Agentscomefirst	Transaction & Escrow Services	Toledo	USA	-	-	agentscomefirst.com
Akru	Invest & Finance	Cincinatti	USA	50/50	3	akru.co
Aston Morley	Transaction & Escrow Services	South-Lake Tahoe	USA	RE > BC	-	astonmorley.com
AVRads	Markets & Platforms	Cheyenne	USA	-	1	avrads.io
BDS Holding LLC	Invest & Finance	Norcross	USA	50/50	1	bigbds.io
Bee Mortgage	Invest & Finance	Jacksonville	USA	50/50	-	beemortgageapp.com
BEI.RE	Research & Valuate	San Jose	USA	BC > RE	1	bei.re
BIT Real Estate Exchange	Invest & Finance	Lewis Center	USA	BC > RE	3	cointinuum.io
BIXReal	Invest & Finance	Lewes	USA	BC > RE	3	bixreal.io
Blockchain CRE	Invest & Finance	Palo Alto	USA	BC > RE	1	blockchaincre.io
Blockchain Hotels	Invest & Finance	Lewes	USA	RE > BC	1	innovasishotels.com
Blockchain in CRE	Building Technologies	Palo Alto	USA	BC > RE	2	blockchaincre.io
Blockcities	Markets & Platforms	Pleasant Grove	USA	BC > RE	2	blockcities.com
BuildBlock	Invest & Finance	San Jose	USA	BC > RE	3	buildblock.io
Casacrowd	Manage & Operate	Delaware	USA	50/50	1	casacrowd.com
Ceres	Invest & Finance	Austin	USA	50/50	3	cerescoin.io
CertifiedTrue	Manage & Operate	New York	USA	BC > RE	3	certifiedtrue.co
Colony Hills	Invest & Finance	Wilbraham	USA	RE > BC	3	colonyhillscapital.com
Community Electricity	Markets & Platforms	Los Angeles	USA	50/50	3	communityelectricity.io
Compound	Invest & Finance	New York	USA	50/50	3	getcompound.com
CompStak	Research & Valuate	New York	USA	RE > BC	1	compstak.com
Concreit	Invest & Finance	Seattle	USA	50/50	3	concreit.com
ConsenSys	Building Technologies	New York	USA	BC > RE	1	consensys.net
Covenantz	Plan & Build	Bellevue	USA	BC > RE	-	covenantz.com
Cprop	Manage & Operate	Covington	USA	BC > RE	3	cprop.io
Crowd Capital	Invest & Finance	Miami	USA	50/50	-	crowdcapital.io
Deedcoin	Transaction & Escrow Services	Melbourne	USA	BC > RE	-	deedcoin.com
DeedLock	Building Technologies	Rochester	USA	BC > RE	-	deedlock.com
Earn.Re	Markets & Platforms	New York	USA	50/50	2	earn.re
Elevated Returns	Invest & Finance	Aspen	USA	RE > BC	-	elevatedreturns.com
Enledger	Invest & Finance	Denver	USA	BC > RE	1	enledger.io
EquityCoin	Invest & Finance	Wilmington	USA	50/50	1	equitycoin.org
Everflow	Invest & Finance	New York	USA	50/50	-	everflow.global
Fabrica	Transaction & Escrow Services	San Francisco	USA	-	-	fabrica.l&
Figure	Invest & Finance	San Francisco	USA	50/50	3	figure.com
Fintech World	Markets & Platforms	Palo Alto	USA	50/50	2	fintechworld.com
FundingTree	Markets & Platforms	Westlake Village	USA	50/50	2	fundingtree.com
Harbor	Invest & Finance	San Francisco	USA	BC > RE	3	harbor.com
HomeBloc	Building Technologies	New York	USA	BC > RE	3	homebloc.io
HouseAfrica	Building Technologies	San Francisco	USA	BC > RE	-	houseafrica.io
Houzlink Technologies	Markets & Platforms	New York	USA	BC > RE	2	houzlinktechnologies.com

Hudly title	Transaction & Escrow Services	Austin	USA	50/50	-	hudlytitle.com
Jointer	Invest & Finance	Los Altos	USA	50/50	2	jointer.io
Konectcity	Building Technologies	Westlake Village	USA	BC > RE	3	konectcity.com
KoreConX	Building Technologies	New York	USA	BC > RE	3	koreconx.com
Liberty Fund	Invest & Finance	Oak Brook	USA	50/50	3	libertyfund.io
Liquidigy	Invest & Finance	Sunnyvale	USA	BC > RE	-	liquidigy.com
Liquidity Horizons	Invest & Finance	Lakeway	USA	50/50	2	liquidityhorizons.com
Mony	Invest & Finance	Los Angeles	USA	50/50	2	mony.network
Mountain Life Companies	Invest & Finance	Denver	USA	50/50	-	mountainlifecompanies.com
NYCREC	Invest & Finance	New York	USA	50/50	2	nycrec.io
NYSTX	Markets & Platforms	New York	USA	50/50	2	nystx.com
Piquet Rentals	Transaction & Escrow Services	Miami	USA	RE > BC	-	piquetrealty.com
Propellr / Fluidity	Manage & Operate	New York	USA	BC > RE	3	propellr.com
PropertyClub	Markets & Platforms	New York	USA	RE > BC	2	propertyclub.nyc
Propy	Markets & Platforms	Delaware	USA	RE > BC	3	propy.com
QuantmRE	Invest & Finance	Newport Beach	USA	RE > BC	2	quantmre.com
R3	Research & Valuate	New York	USA	BC > RE	3	rcom
Real Asset Exchange	Invest & Finance	San Jose	USA	50/50	2	rax.exchange
Real Trade	Markets & Platforms	West Palm Beach	USA	RE > BC	2	realtrade.io
Realblocks	Invest & Finance	New York	USA	BC > RE	3	realblocks.com
Realio	Invest & Finance	New York	USA	50/50	2	realio.fund
Realium	**Invest & Finance**	**Provo**	**USA**	**BC > RE**	**2**	**realium.io**
RealNex	Markets & Platforms	Stafford	USA	RE > BC	3	realnex.com
RealT	Invest & Finance	Aventura	USA	50/50	-	realt.co
Realto	Invest & Finance	Frisco	USA	RE > BC	3	realto.estate
Rebloc	Research & Valuate	New York	USA	BC > RE	1	rebloc.io
Recon	Manage & Operate	San Francisco	USA	BC > RE	3	reconsortia.com
Red Swan	Invest & Finance	Houston	USA	50/50	3	redswan.io
Reinno	Invest & Finance	Massachusetts	USA	50/50	2	reinno.io
RELedger	Markets & Platforms	New York	USA	BC > RE	2	reledger.org
Relex	Invest & Finance	New Jersey	USA	50/50	3	relex.io
Rentivity	Markets & Platforms	Orlando	USA	RE > BC	2	rentivity.com
Reposit	Invest & Finance	San Francisco	USA	50/50	2	reposit.com
Resolute	Invest & Finance	New York	USA	50/50	-	resolute.fund
Resourceblockchain	Building Technologies	Denver	USA	RE > BC	3	resourceblockchain.io
Rise Markets	Invest & Finance	New York	USA	50/50	-	risemarkets.io
Securitize	Invest & Finance	New York	USA	50/50	3	securitize.io
ShelterZoom Corp.	Manage & Operate	New York	USA	BC > RE	3	shelterzoom.com
Smart Florida	Building Technologies	Miami	USA	BC > RE	-	smartfl.org
SmartSaleRE	Invest & Finance	Clearlake Park	USA	BC > RE	2	smartsalere.com
Social Spaces	Markets & Platforms	Los Angeles	USA	50/50	2	socialspaces.life
Socratic Consultancy	**Manage & Operate**	**Seattle**	**USA**	**50/50**	**3**	**socraticconsultancy.com**
SoluLab	Building Technologies	Los Angeles	USA	BC > RE	-	solulab.com
StreetWire	Research & Valuate	New York	USA	50/50	1	streetwire.net

Superworld	Markets & Platforms	Los Angeles	USA	50/50	2	superworldapp.com
Task Cycle	Building Technologies	Atlanta	USA	BC > RE	3	gettaskcycle.com
Tellus Title Company	Manage & Operate	San Francisco	USA	BC > RE	3	tellustitle.com
TerraChain CRE	Manage & Operate	Seattle	USA	BC > RE	3	terra-chain.io
The LendingCoin	Invest & Finance	Boise	USA	50/50	3	thelendingcoin.com
The Praetorian Group	Invest & Finance	New York	USA	50/50	3	praetoriangroup.io
Token Listings	Markets & Platforms	New York	USA	50/50	2	tokenproperty.netlify.com
Ubitquity LLC	**Manage & Operate**	**Wilmington**	**USA**	**BC > RE**	**3**	**ubitquity.io**
Uprets	Invest & Finance	New York	USA	50/50	-	uprets.io
Vairt	Invest & Finance	Connecticut	USA	BC > RE	2	vairt.com
vBlock	Transaction & Escrow Services	Rochester	USA	50/50	-	vblock.us
Vertalo	**Markets & Platforms**	**Austin**	**USA**	**RE > BC**	**3**	**vertalo.com**
Vesta	Invest & Finance	Sarasota	USA	RE > BC	2	vestaequity.com
Vestfar	Invest & Finance	Los Angeles	USA	BC > RE	2	vestfar.io
VTS	Manage & Operate	New York	USA	RE > BC	3	vts.com
Weaver	Invest & Finance	New York	USA	-	-	weaver-iq.com
WePropertyOwners	Markets & Platforms	Newport Beach	USA	RE > BC	1	wepropertyowners.com
Yinc	Markets & Platforms	Los Angeles	USA	BC > RE	2	yinc.com
Yoonify	Invest & Finance	San Diego	USA	50/50	3	yoonify.io
Zeehaus Inc.	Invest & Finance	San Francisco	USA	50/50	3	zeehaus.com
Zweispace	Plan & Build	Sunnyvale	USA	RE > BC	3	zweispace.co.jp

Our Global Sponsor

Support in bringing together the expertise of pioneers and exchanging knowledge and insights that have already been gained.

CBRE

cbre.com

„The partnership with FIBREE offers us excellent opportunities to engage with the real estate blockchain scene in a global network," says Dr. Susanne Hügel, Head of Digital Innovation & Business Acceleration CE at CBRE. „It is great to see how well established FIBREE has become since its foundation in 2018 by constantly sharing knowledge and insights on blockchain applications for real estate." CBRE, a Fortune 500 and S&P 500 company, is the world's largest commercial real estate services and investment firm (based on 2020 revenue). CBRE has more than 100,000 professionals serving a diverse range of clients with an integrated suite of services in more than 100 countries.

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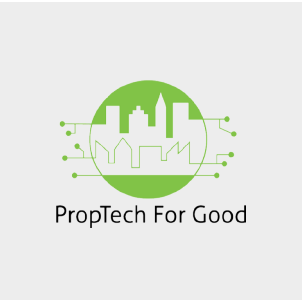
Alastria
alastria.io

Global Proptech
globalproptech.online

Dialogue Capital
dialoguecapital.com

UNIC Blockchain Programs
unic.ac.cy/blockchain

Blockchain Expo
blockchain-expo.com



PropTech For Good
proptechforgood.com

FIBREE Executive Board

Based on the steady growth of the network we clearly stated that evenmore we want to connect people and organisations globally who share a common interest of blockchain and real estate. By bringing together the expertise of pioneers in this field and sharing knowledge and insights already gained, FIBREE wants to make an important contribution to the adoption and implementation of this technology in the real estate market in the coming years.

Our mission

Since founding FIBREE three years ago not only our network is growing, but our day to day challenges. We therefore decided to enlarge the board seats and being more diverse in sense of gender, location and expertise. We are proud to have the best experts within FIBREE and to have regional chairs that can lead and inspire their network, thus being able providing the best data about blockchain and real estate in each local network.

With the newly introduced concept of the FIBREE Challenge we created a framework to cooperate with industry players on specific topics and lower the entry barrier for companies or individuals in applying innovative solutions. The first endeavour on this new concept is the FIBREE Tokenization Challenge that will help to increase the number of tokenized real estate.

Furthermore we are developing the FIBREE consultancy service that will match the competencies of the international FIBREE network with the many inquiries we receive from the real estate industry.

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President

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Vice President

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Kevin O'Grady

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Andrés Assmus

Board Member

Bogotá, Colombia

The FIBREE Tokenization Challenge 2021 — We're off to a Great Start!

Author: Denis Petrovcic, FIBREE Co-Chair - Ljubljana (Slovenia)

Since the beginning of FIBREE's founding, our vision has always been to help connect people with similar interests and different backgrounds. The value that FIBREE creates is undoubtedly huge and is reflected in the constantly growing number of participants within the network. This steady organic growth has prompted FIBREE to appear on the radar of some of the industry's biggest players such as CBRE, the world's largest commercial real estate services company. CBRE recently renewed their position as FIBREE's global sponsor, positioning FIBREE as an organization that is ready to jump to the next step.

2021 is demonstrating FIBREE's importance not only for startups, SMEs and corporations, but also for individuals who wish to become actively involved. The great success of the FIBREE Tokenization Challenge, announced in collaboration with the challenge sponsor, Blocksquare, has proven that we have entered a position of driving adoption. By bringing more than 40 teams from all over the world to apply and compete to tokenize a single property, the Challenge has exceeded all expectations. The first three participants to successfully tokenize a single real estate property will be awarded with their own white-label real estate tokenization platform powered by Blocksquare — an award worth more than 150,000 EUR in licenses and services.

To give you a bit of background, the challenge comes on the heels of a research paper that was conducted in collaboration with the University of Oxford Saïd Business School which found the practice of property tokenization to be almost non-existent in the current real estate market. Achim Jedelsky, alongside other FIBREE board members, understands more cases of asset tokenization need to be brought to the market before things can start to change on a larger scale.

"As a leading organization spanning more than 60 communities across the globe, FIBREE's mission is to grow the knowledge about the use of blockchain in real estate," explains Achim Jedelksy, FIBREE's president. "The best way to do that is by working on real-life problems."

In his view, the Challenge is a way of hastening the "rubber meets the road" moment for those players who understand the benefits of blockchain but hesitate when it comes to implementation.

"There are a lot of theoretical talks and workshops around blockchain," he emphasized. "Often companies don't manage to go past that stage and fail to start specific projects or at least pilot projects. We see the Challenge as a door-opener for applied corporate innovation that helps create concrete outcomes."

The challenge is the first time that members of the public will be able to learn about Blocksquare's tokenization process, put it to the test and take a sneak peek into the future of the real estate business.

"The Challenge offers everyone the chance to learn more about the tokenization of real estate," Jedelsky contends. "Together with Blocksquare, we provide the technological infrastructure to do this; applicants only need to secure a real estate property to tokenize."

"We have a startup that has been looking for ways to tokenize real estate for a while," says Henrique Conte, financial manager at BRAVO Empreendimentos, an innovative Brazilian real estate company. "When we heard about the challenge, we knew it would be a great opportunity to get out of the inertia. Other challenges such as this one would bring a much needed help to grow the community and bring responsible people to the table," BRAVO has applied to the Challenge alongside Hanasson Limited.

In fact, FIBREE's vision is to host more challenges like this in the near future. From my personal experience, and as the CEO of Blocksquare, I believe sponsoring this challenge was one of the best things we did this year. The value FIBREE brings to the table is immense and I can already see other sponsors coming up with new challenges after this one concludes.

Dan Lazar, a Forbes 30 under 30 serial entrepreneur, comments on his application: "I applied to tokenize the first project in Australia!" Dan who exited two companies before turning 27, is a former tennis player and vice-champion of Romania, who „raised" the first round of funding for HeroX on Shark Tank. When asked what he likes about the challenge and FIBREE's approach, Dan answers, "The simple but effective way of accelerating the adoption of tokenization. It seems almost too good to be true. All in all, there are amazing people involved, always ready to assist."

The FIBREE's Tokenization Challenge also attracted some deserved media attention, through Michael Juul Rugaard, founding partner of Norfico and the editor-in-chief at The Tokenizer. „We have a collective obligation to help push our new industry forward. And the Real Estate Tokenization Challenge is a good example of an initiative with the potential to accelerate things for the benefit of all. And, of course, it's a great opportunity for creative teams to explore exciting ways of tokenizing real estate."

With this report being published only days after the official closing for new applications to the challenge, FIBREE, Blocksquare and The Tokenizer have agreed to publish exclusive articles and interviews about the various teams participating in the FIBREE Tokenization Challenge 2021. The Tokenizer will thus be exclusively covering their progress and sharing the outcomes with the wider community.

"I found this to be a great initiative and I fully support for FIBREE to partner with other companies in the near term future to organize similar challenges that can promote the development of blockchain applications for the real estate market." said Rubens Neistein, one of the biggest advocates for real estate tokenization in South America.

Rubens is focused on driving his team to the top three. "I see the FIBREE Challenge as an opportunity to pioneer our market and show Brazil how tokenization of a property can be carried out in a safe and efficient way. Blocksquare seems like the perfect match for our team to succeed!" he said.

FIBREE and Blocksquare wish success to all the teams who are participating in the FIBREE Tokenization Challenge 2021. •

Advisory & Consultancy Services of FIBREE

Author: Evangelos Lianos, FIBREE Co-Chair - Athens (Greece)

FIBREE Advisory & Consultancy Services

FIBREE's core mission is to bring together real estate professionals and blockchain specialists to exchange expertise. FIBREE has an extensive network of different sector specific experts and partners, therefore companies and governments benefit from FIBREE's collective knowledge and experience with regard to real estate assets digitization, securitization, tokenization, regulation and more.

In addition to industry experts, FIBREE's network includes academics who research the prevailing methodologies in various markets, including digitalization of the construction industry and governance with blockchain.

FIBREE's presence in already 40 countries guarantees global insights and state-of-the-art blockchain applicable technology consultancy capabilities.

Once a client initiates preliminary communication with members of FIBREE (https://bit.ly/32OvRKU), FIBREE custom builds an All-Star-Team of the most suitable experts and partners in the respective fields to optimally serve the client's needs. FIBREE's 360-degree, full-scale approach accompanies the client from the ideation phase of first discussions to the concept phase for the establishment of a detailed business model and action plan to the execution phase.

For private or corporate clients, FIBREE has recently started introducing a structured services approach.

Use Case: Tokenization

A tokenization project commences with the pre-assessment including:

- *Scope assessment and realization valuation;*
- *Understanding the asset (tangible/intangible/NFT class type, subtype);*
- *Optimizing structure for the STO;*
- *Framing financing requirements and token type definition (equity, debt, asset-backed, etc.);*
- *Reviewing existing business/project documentation (business plan);*
- *Adaptation of documentation to STO requirements;*
- *Assessment of regulated or unregulated STO approach;*
- *Risks/benefits analysis;*
- *Budget/cost definition for all phases prior, during & after launch.*

If the FIBREE analysis suggests that a tokenization of a specific asset makes sense, the STO concept definition and implementation detailing services will follow. These include:

- *Approach & project planning, optimal timing and workplan;*
- *Targeting investors for the specific STO (types, countries, etc.);*
- *Token design / conditions definitions.*

Smart contracts are the backbone of blockchain transactions. FIBREE advises on concept, design, programming and auditing.

Trading happens on centralized and decentralized exchanges on the blockchain. FIBREE offers services focusing on market evaluation of exchanges for tokens and coins trading and issuance, recommendations or use-case reports based on hypothetical or planned projects.

The blockchain (and smart contracts) need information-feed-in from the off-chain realm. FIBREE analyzes the market and technology, creates trust and legal reviews and recommends Oracle platforms based on the specific project at hand.

FIBREE has an extensive global network of legal experts who can be utilized as needed for regulatory, legal and contractual matters. With respect to STOs, FIBREE's legal partners advise on issues such as:

- *Legal set-up recommendations based on selected jurisdiction;*
- *Regulation and jurisdiction issuance advisory;*
- *Coordination for establishment of SPV(s);*
- *Communication with regulator(s);*
- *Recommendations for managing partner relationships (legal, issuance, etc.) in selected jurisdictions.*

When we are asked, "How can my company benefit from these new technologies called blockchain and tokenization?" FIBREE's Management Advisory services comes into action to offer the following:

- *Risks/benefits analysis on opportunities in tokenization of existing or future corporate assets;*
- *Investment approach & managing opportunities in tokenized third-parties assets; and*
- *Workshops for management and teams.*
- *Roadmap-creation with clear and realistic milestones*

On the practical front, it is evident that the FIBREE-network and available expertise can provide hands-on, experienced-based services for our clients, including

- *Preparing information documentation (one-pager, whitepaper, public technical specifications, etc.);*
- *Evaluating and selecting best fitting technology platforms for the specific STO;*
- *Adapting an investors' dashboard for custody, security, KYC/AML, etc.;*
- *Recommendation of marketing/PR agencies;*
- *Advising and supporting in the execution of the marketing, PR & sales strategy;*
- *Turn-key project management and implementation of STO Projects.*

Our goal is to enhance the widespread use of blockchain technology and to promote the benefits for the public at large. Therefore, it is important for FIBREE to work with governments, universities, market organizations and regulatory bodies towards that end. Therefore, FIBREE offers specific advisory on:

- *Blockchain, tokenization (assets, financial instruments, NFTs);*
- *Regulation drafting & reviews on digital assets, RE & land registry;*
- *Legal support;*
- *Education and workshops;*
- *Knowledge / experience exchange with other regulators;*
- *All around support for integration into governmental digital strategy.*

Knowledge exchange is part of our mission. We provide education and training in the form of short virtual or on-site seminars, webinars, and deep-dive courses. We design educational programs for companies, governments and educational organizations around our major themes.

If you are interested in learning more about FIBREE's Services let us know. Contact us on https://bit.ly/32OvRKU or send us an email to consult@fibree.org

The FIBREE "Fintech Navigator"

Author: Walter Strametz, FIBREE Chair - Zug (Switzerland)

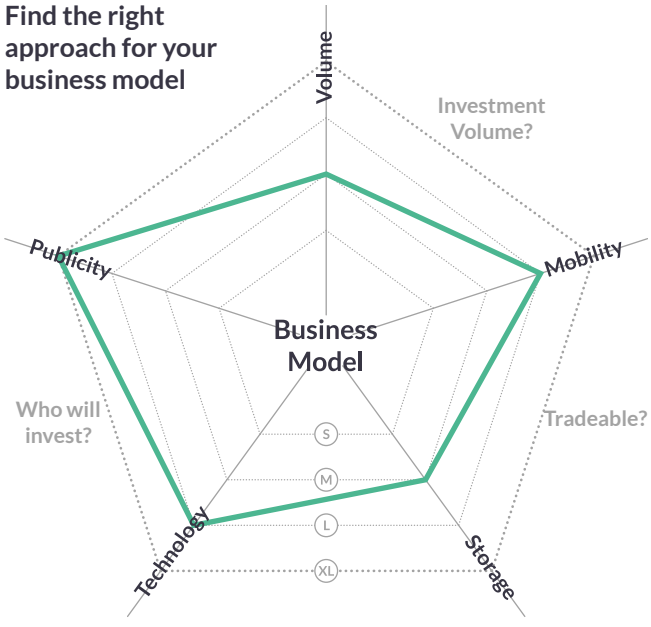
Blockchain technology offers more flexibility than traditional financing: Crowdfunding, public tradable shares or participation rights can be combined in one digital product that can be sold on an individual website. However, using disruptive technology such as blockchain may lead to confusion. This overview will help answer some of the important questions when using this new technology in relation to asset tokenization and trading.

- ***Volume:*** *Is there a minimum or maximum size of an investment using blockchain technology? Can both crypto and real money be used?*
- ***Mobility:*** *Can the investment be traded, i.e., bought and sold?*
- ***Storage:*** *How is money from the investment disbursed?*
- ***Publicity:*** *On what platforms will the investment be sold? And who is eligible to invest?*
- ***Technology:*** *Is there a limit on the type of technology that can be used in an investment scheme?*

- ***Volume:*** *What is the investment size overall and per person? Crypto or real money?*
- ***Mobility:*** *What can be done with the investment? Can it be traded?*
- ***Storage:*** *Who stores the private keys if wallets are involved?*
- ***Publicity:*** *Where will the investment be sold? To professional investors, costumers, employees or publicly?*
- ***Technology:*** *What can be done with the investment? Can it be traded? Who stores the private keys if wallets are involved?*

When dealing with smart contracts, a computer program or a transaction protocol which is intended to automatically execute the terms of a contract or an agreement, every token may have different dimensions based on the business model of the token. If we standardize and simplify the many types of tokenization projects with a classification of T-Shirt sizes - Small, Medium, Large and X-Large - everyour tokenization project can be mapped to this model, as well as to the regulations of different countries, thus making them more easily comparable. For example, who the buyers of your tokens are makes a difference. Two such examples are a private placement among professionals or a public offering of tokens where consumer investment protection fully affects the business model.

Below, we will examine tokenization vectors in Austria using not only the idea of standardized Small, Medium, Large and X-Large approaches to business, but also to the questions of volume, mobility, storage, publicity and technology. •



(S) *Small: Low cost, immediate start*
(M) *Medium: Low cost, < 3 months*
(L) *Large: Costly & time intense < 6 months*
(XL) *X-Large: Similar to offer public shares, prospectus needed*

Tokenization Vectors - FIBREE Fintech Navigator Applied on Regulatory Aspects in Austria

Authors: Walter Strametz, Christoph Urbanek, Attorney at Law - Vienna (Austria), Armin Redl, Associate - Vienna (Austria)

Kind of Token/Token Classification

In Austria, a distinction can be made between three types of tokens which are also widely recognized by the Austrian Financial Market Supervision („FMA"): i) security token, ii) payment token and iii) utility token. This classification is not conclusive as there are hybrid forms as well as other types of tokens, and the specific design of the token is relevant in each individual case.

Security tokens are often considered as transferable securities as defined in the Austrian Capital Market Act 2019 (Kapitalmarktgesetz 2019) and the Austrian Securities Supervision Act 2018 (Wertpapieraufsichtsgesetz 2018), which are based on MiFID II, whereby this classification is conducted on a case-by-case basis. Security tokens embody claims for a pay-out towards the issuer which may be designed in accordance with corporate law or under contract law. According to the FMA, there is a strong indication for such a classification if the rights associated with the token are comparable to well-known categories of securities.

In particular, the „embodiment" of a right (payment of capital), the tradability and the comparability with shares, bonds or similar transferable securities therefore indicate the existence of a security.

Utility tokens are primarily designed to provide the holder with a benefit related to a specific product or service (vouchers). A payment token is a type of token whose primary purpose is a payment function.

Publicity:

S: According to the Austrian Capital Market Act 2019, if a token is regarded as a security or an investment, it is exempt from publishing a prospectus if:

- *There is no public offering;*
- *The total investment volume is capped at EUR 250.000;*
- *An investment offer where the minimum investment amount required by an investor is EUR 100.000 or an investment offer with a minimum denomination of EUR 100.000;*
- *A securities or investment offer that is addressed exclusively to qualified investors;*
- *An offer addressed to fewer than 150 natural or legal persons per EEA member states who are not qualified investors;*

No prospectus is required if the token does not qualify as a security or investment.

M: A public offering with a total investment volume of less than EUR 2 million is also exempt from the prospectus requirement. If the investment volume exceeds EUR 250.000 but is less than EUR 2 million, only the preparation of an information sheet in accordance with the Austrian Alternative Financing Act *(Alternativfinanzierungsgesetz)* is required.

L: A public offering of securities or investments with an investment volume ranging between EUR 2 million and EUR 5 million requires the preparation of a full capital market prospectus in accordance with the Austrian Capital Market Act.

XL: Public offerings of securities in excess of EUR 5 million require the preparation of a prospectus as defined by the European Prospectus Regulation.

Technology

Austrian law does not regulate the application of specific technologies.

Mobility

S: Peer-to-peer trading is admissible.

M: Public issuance/marketing of securities requires the applicability of the prospectus provisions and might trigger a license requirement as an investment services company.

L: The marketing of „third-party" securities is subject to a license and requires a license as an investment services company. Third-party securities also include those of subsidiaries or sister companies.

XL: A token exchange for tokens that qualify as securities may trigger a license as an exchange or OTF/MTF. A pure brokerage platform for peer-to-peer trading does not trigger a license requirement.

Storage

S: Providers in relation to virtual currencies (such as a crypto wallet provider) need to be registered before offering their services in Austria under the Austrian Financial Markets Anti-Money Laundering Act. However, tokens are not considered to be virtual currencies. Virtual currencies are defined as „a digital representation of value that is not issued or guaranteed by a central bank or a public authority, is not necessarily attached to a legally established currency and does not possess a legal status of currency or money, but is accepted by natural or legal persons as a means of exchange and which can be transferred, stored and traded electronically."

M: Tokens that do not qualify as securities or investments may be held in trust at any time and without a license.

L: Self-custody is not regulated.

XL: The safekeeping (custody) of securities requires a license as a custodian bank and is consequently a banking business subject to licensing.

Nature

S: Utility tokens are generally not subject to supervisory/regulatory law. A utility token provides the holder with a benefit related to a specific product or service, e.g. a voucher for a stay in a hotel.

M: If the token represents a means of payment, it qualifies as a Payment Token. In this case, certain regulatory laws apply.

L: Tokens can embody profit participation rights, corporate bonds or any other type of debt security. They then usually qualify as securities, which is why the supervisory/regulatory provisions apply.

XL: Tokens can also represent shares (stocks) of a stock company (Aktiengesellschaft). However, tokens cannot represent limited liability company shares, because these are subject to strict formal requirements under Austrian law. •

FIBREE Academic Board (FAB)

The main objective is to share knowledge in this specific research area and to increase the number of participants with a scientific or professional research background. This specific professional group (academic partners) is intended for professionals who are active in real estate or blockchain/IT within the FIBREE community. The academic board offers student participation and PhD participation.

Purpose

The objective of the AB is to increase the number of participants in FIBREE and thus also the number of participants with a scientific or professional research background. This is a specific, but very valuable, professional group (Academic partner) intended for professionals who are professionally active in real estate or Blockchain/IT. within the FIBREE community, which is expected to experience great added value if it can be easily connected to scientific and research professionals elsewhere in the world. FIBREE has many advantages for this community because they, as researchers and scientists, share their research results within FIBREE. That is why FIBREE wants to set up the ‚AB' specifically intended to unite and, where possible, facilitate this community. The AB advises the board of FIBREE on both solicited and unsolicited matters relating to FIBREE's strategy and the connection - both internally and externally - with professional research institutes and professional researchers and scientists.

Education

We are working on a way of incorporating developments about Blockchain and real estate into a Massive Open Online Course (MOOC) with opportunities for certification, mirco credentials, etc. in collaboration with other universities and the professional field.

PhD-participation

Scientists with a PhD title or PhD candidates and/or a professional association with a university of applied sciences can participate in this group. The main objective is to share knowledge in this specific research area and to jointly develop a scientific agenda. In addition to the two Meetups per year in which participation is possible, at least four new research-output titles in the field of Blockchain & real estate can be delivered.

Activities 2020-2022

- ***2021***
  Start database thesis en PhD researches
- ***September 16-17, 2021***
  Participation on CIRRE 2021 The Netherlands www. cirre.eu with presentations and publications of research.
- ***End of 2021***
  Blockchain PhD Day
- ***January 30, 2022 - February 4, 2022***
  Blockchain Week Saxion University The Netherlands with PhD-day, FIBREE Blockchain & real estate day and Blockchain Challenge.
- ***June 2021***
  Scientific articles in FIBREE Industry Report 2021

Prof. Dr. Ing. Jan Veuger, MRE, FRICS

President, Saxion University of Applied Sciences (Blockchain Institute)

Netherlands

Prof. Dr. Michael Truebestein, MRICS

Lucerne University of Applied Sciences and Arts

Switzerland

Dr. Balkiz Yapicioglu

Arkin University of Creative Arts and Design

Cyprus

Dr. Rebecca Leshinsky

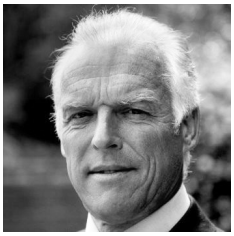
RMIT University

Australia

Alexander Appelmans, MSc

KU Leuven

Belgium



Andrew Baum

Saïd Business School University of Oxford

United Kingdom

Dr. Eleni Papadonikolaki

The Bartlett School of Construction and Project Management (Faculty of the Built Environment)

United Kingdom

Summary on Blockchain Research in the Leading Global Academic Institutions

Author: Jan Veuger, President Academic Board, FIBREE

FIBREE's Academic Board (AB) was established in 2019 with the aim of bringing together real estate professionals and blockchain specialists from around the world to exchange academic expertise. The AB is aware of the current state of academic level research on blockchain technology, which can be further expanded in the coming years. The mission of FIBREE's AB is to help create a realistic academic expectation that the real estate market will discover and exploit the true potential of blockchain technology. By bringing together academics and pioneers in this field and sharing already acquired knowledge and insights, FIBREE's AB aims to contribute to the adoption and implementation of this technology in the academic and real estate markets. In addition, the AB expects to contribute to FIBREE through Industry Reports such as this which give an indication of the development of blockchain and real estate from FIBREE's research worldwide. This article provides an overview and analysis of current and relevant scientific insights from academic partners within FIBREE.

Methodology Worldwide

We asked every Regional Chair (RC) and active community-members who are academically engaged in blockchain and real estate research to answer the following questions: (1) What blockchain and real estate research do you see occuring and is it relevant from your point of view?; (2) What research output on blockchain and real estate have you developed?; and (3) Can you identify the experts on blockchain and real estate at the academic level?

An overview of the surveyed academic experts can be found in the table below. The data collection started in mid-March-May 2021. In April and May 2021, the analysis was carried out centrally and coordinated, with the RC.

Name	Organization	Region	Country	FIBREE role / Contact of
Prof. Dr. Michael Truebestein, MRICS	Lucerne University of Applied Sciences and Arts	Luzern	Switzerland	Academic Board
Dr. Balkiz Yapicioglu	Arkin University of Creative Arts and Design	Arkin	Cyprus	Academic Board
Dr. Rebecca Leshinsky	RMIT University	Melbourne	Australia	Academic Board
Alexander Appelmans MSc	KU Leuven	Leuven	Belgium	Academic Board
Andrew Baum	Saïd Business School University of Oxford	Oxford	UK	Academic Board
Dr. Eleni Papadonikolaki	The Bartlett School of Construction and Project Management	London	UK	Academic Board
Alan McNamara	PhD Candidate in Digital Construction	Sydney	Australia	Academic Board
Bill Stanford	Licensed Real Estate instructor for New York	New York	USA	Regional Chair FIBREE
Marc Driessen	Lecturer for Real Estate Economics at NBS Northern Business School University for Applied Sciences in Hamburg	Hamburg	Germany	Regional Chair FIBREE
Jeremy Barnett	Honorary Professor at the Bartlett, UCL (BREIT)	London	UK	Regional Chair FIBREE
Yingli Wang	Reader in Logistics and Operations Management at Cardiff University	Cardiff	UK	Kevin O' Grady
Achim Jedelsky	Visiting lecturer at HTW Berlin	Berlin	Germany	FIBREE Executive Board
Andrea Romaoli	Professor for Master Degree in Science of Law in IBET UNIVERSITY	Valetta	Malta	Regional Chair FIBREE
Prof. Dr.-Ing. Katarina Adam	HTW Berlin	Berlin	Germany	Achim Jedelsky / Jo Bronckers
Lee Bratcher	Professor at DBU researching blockchain applications in social science at The University of Texas	Dallas	USA	Regional Chair FIBREE
Claus Skaaning	PhD at Department of Computer Science, Aalborg University	Aalborg	Denmark	Regional Chair FIBREE
Jose Reis Santos	Professor at ISTEC	Lisbon	Portugal	Regional Chair FIBREE
Anetta Proskurovska	PHD Researcher (Industrial Fellowship) in economic geography at Luxembourg Institute of Socio-Economic Research (LISER)	Luxembourg	Luxembourg	John Dean Markunas / Jo Bronckers
Jacob Sagi	Professor at UNC Kenan-Flagler Business School	Chapel Hill	USA	Jo Bronckers
Federico Garaventa	Former Professor at the University of Genova, Faculty of Architecture	Genova	Italy	Regional Chair FIBREE
Knut Hinkelmann	Professor at FHNW University of Applied Sciences and Arts Northwestern Switzerland	Basel	Switzerland	Achim Jedelsky / Jo Bronckers
Galia Kondova	Senior Lecturer and Researcher, University of Applied Sciences and Arts Northwestern Switzerland	Basel	Switzerland	Achim Jedelsky / Jo Bronckers
Fabian Suess	Visiting lecturer for Scrum, Design Thinking & Lean Startup in Facility Management & in the Center for Digital Transformation at Baden-Wuerttemberg Cooperative State University (DHBW) Stuttgart	Stuttgart	Germany	Regional Chair FIBREE
Anniina Saari	Doctoral Candidate, Aalto University School of Engineering	Aalto	Finland	Jo Bronckers
Dirk Brounen	Professor of Real Estate at Tilburg University (TIAS Vastgoedlab)	Tilburg	Netherlands	Jo Bronckers
Prof Cristina Poncibo'	Professor in International Law and Comparative Law System	Turin	Italy	Alex Dell Orto
Emanuele Ricciardi	Department of Development and Landscape - Politecnico Milano	Milan	Italy	Regional Chair FIBREE
Dr. Ing. Jan Veuger MRE FRICS	Saxion University of Applied Sciences (Blockchain Institute)	Deventer	Netherlands	Academic Board

Table 1: Academic experts. Response: In total, 28 experts were asked to complete the survey, 15 of whom did so, all of whom were useful for the study. The total response rate is therefore 54% and can be generalised. Jan Veuger did not participate in the survey as he is the author of the article and the survey.

Active Universities and Companies in Research on Blockchain and Real Estate

When asked, which universities or companies are most active in research on blockchain and real estate, we can conclude that England (Cardiff University, UCL, Oxford Said Business School, University of British Columbia), in particular is a leader in the field followed by the Netherlands (Saxion UAS and University of Maastricht). Looking at companies, there were only a limited number mentioned (4): DigiShares, Cronos Group, IBM and Dutch Blockchain Coalition.

PhD Research on Blockchain and Real Estate

Following the survey answers as to where PhD research on blockchain and real estate is taking place, it seems to be limited. Only five universities are mentioned: Technischen Universität Kosice, Liverpool Business School, Aalto University, Finland, University of Turin and KU Leuven. In addition, only three specific names of PhD researchers are mentioned. When we look at the level of research in the field of blockchain and real estate, we see that it is mainly at a PhD level (70%) and to a lesser extent applied at the bachelor level (30%).

Topics

The experts were asked which topics they see being researched with regards to blockchain and real estate. The following topics were listed in order of receiving the most mention: Transaction & Escrow Services (30%) and Invest & Finance (30%) scored the highest of all topics, followed by Smart City Solutions (20%), Market & Platforms (10%) and Research & Valuate (10%). This shows that the financial side of real estate in particular receives more attention while Research & Valuate received the least attention.

Research in Countries

Responding to the question of which countries are engaged in blockchain and real estate research generated five front runners: The Netherlands (25%), UK (20%), Germany (10%), Sweden (10%), and the US (10%). All other countries listed including Canada, Estonia, Belgium, Switzerland and Hong Kong all scored 5%.

Keywords in Research

> ***Digital Twin, Land Title Registry, Response, Provenance, Circular Economy, IoT, BIM, Trust, Open-Ended, Smart Contract, Transaction, Peer to Peer, Tokenization, Ownership Fractionalization, Decentralized Machine Lending***

Leading Authors of Blockchain and Real Estate Studies

The answer to the question of which individuals are leading in blockchain and real estate studies is limited. Besides the fact that some respondents say they don't know and/or don't think it's relevant, there was also a comment that it depends on which subcategory of topic was involved. Names that are mentioned once are Victoria Lemieux. Andrew Baum, Sjef van Erp, Alexander Savelyedv, Jaques Vos, Nasarre-Aznarm, Tjon Tjin Tai and Jan Veuger (three times).

The Focus of Research in the Coming Years

The respondents indicated - in no particular order - that the following focus points should be applied:

- *Long term applications.*
- *New business models with decentralized applications based on blockchain technology.*
- *Funding of real estate development projects.*
- *Investing.*
- *Supply chain.*
- *Smart contracts.*
- *Sustainability, business use cases and scale-up applications, tokenization.*
- *An EU comparative study about blockchain and real estate law(s).*

Overall, quality research is needed in many areas. Thus far, the academic blockchain research has concentrated on technical aspects. In the short term, the respondents believe quality case studies of actual blockchain real estate applications (even if on closed/private blockchains) - successful or unsuccessful - would benefit both academia and the practitioners. The research should answer why blockchain has been applied and how it was applied. The scope of the case studies should be thorough and concentrate on the business benefits that were received (if any) when compared to traditional centralized solutions. Examining actual cases would help the general public to understand blockchain better as well as help in forming best practices through experience.

Topics on the FIBREE Academic Board in the Coming Years

Respondents were also asked what topics should be on the FIBREE Academic Board's agenda in the coming years. Based on the survey, the following topics will be on the agenda in the coming years. The topics are:

- *Creating a FIBREE blockchain and real estate certification program.*
- *Standardization, communication, forming strong networks.*
- *Interaction with other technologies.*
- *Monitoring the development of real, working business solutions and building the bridge between them and real estate players.*
- *Digital Twins for machine lending.*
- *NFT and Decentralized Finance (Defi).*

Chairs

Europe

- **Austria**
  - Dominik Alphart / Vienna
  - Florian Huber / Vienna
  - Marco Neumayer / Graz
- **Belgium**
  - Alexander Appelmans / Brussels
- **Croatia**
  - Tomica Cesar / Zagreb
- **Denmark**
  - Claus Skaaning / Coopenhagen
- **Finland**
  - Ivan Nokhrin / Helsinki
- **France**
  - Grégoire d'Avout / Paris
- **Georgia**
  - Mariam Turashvili / Tibilisi
- **Germany**
  - Achim Jedelsky / Berlin
  - Axel von Goldbeck / Berlin
  - Balte Jorns / Bremen
  - Fabian Süß / Stuttgart
  - Marc Driessen / Hamburg
  - Michael Reuter / Munich
  - Paul Huelsmann / Hamburg
  - Roland Farhat / Frankfurt
  - Sandor Horvath / Regensburg
  - Sebastian Steimer / Stuttgart
- **Greece**
  - Evangelos Lianos / Athens
  - Paul Tzelepis / Athens
  - Stefanie Behrendt / Athens
- **Hungary**
  - Kornel Kalocsai / Budapest
- **Ireland**
  - David Lyons / Dublin
- **Italy**
  - Alessandro Dell'Orto / Milano
  - Emanuele Rizzardi / Milano
  - Federico Garaventa / Genova
  - Francesco Filippo Bruno / Milano
  - Gianfranco Dote / Florence
  - Patrizia Giannini / Roma
- **Luxembourg**
  - Audrey Baverel / Luxembourg
- **Malta**
  - Andrea Romaoli / Valetta
- **Netherlands**
  - Jan Veuger / Groningen
  - Jo Bronckers / Amsterdam
- **Poland**
  - Adrian Karczewicz / Warsaw
  - Alexander Morari / Warsaw
  - Sylwia Toczyska / Warsaw
- **Portugal**
  - Cristina Cornelia Campian / Lisbon
  - José Reis Santos / Lisbon
- **Russia**
  - Stephen Inscoe / Moscow
- **Slovenia**
  - Andrej Lampe / Ljubljana
  - Denis Petrovcic / Ljubljana
- **Spain**
  - Alfredo Diaz-Araque Moro / Madrid
  - Ali Parandeh Zandpour / Malaga
  - Andrew Mark Campbell-Boross / Levante
  - Daniel Codina / Barcelona
  - Edwin Mata / Barcelona
  - Eric Sanchez Galvez / Sevilla
  - José Garciá Caballero / Levante
  - Lorenzo Moreno Muñoz / Barcelona
  - Miguel Linera Alperi / Madrid
  - Vicente Ortiz Alonso / Malaga
- **Switzerland**
  - Lutz Thelen / Zug
  - Michael Trübestein / Zug
  - Paolo Siligoni / Lugano
  - Walter Strametz / Zug
- **Turkey**
  - Sima Baktas / Istanbul
- **United Kingdom**
  - Irina Karagyaur / London
  - Jeremy Barnett / London
  - Kevin O'Grady / London

Middle East and Africa

- **Israel**
  - Ido Shacham / Tel Aviv
  - Or Perelman / Tel Aviv
  - Yael Tamar / Tel Aviv
- **Kenia**
  - Samuel Ouko / Nairobi
- **Nigeria**
  - Ifemayowa Omotunde-Bank / Lagos
  - Jide Oluwadeyi / Lagos
  - Justin Okpu / Abuja
  - Nura Jibo / Abuja
  - Sola Enitan / Lagos
- **Uganda**
  - Ronald Kaweesi / Kampala
- **Saudi Arabia**
  - Faraj Alhouty / Riyadh
- **United Arabic Emirates**
  - Makram Hani / Dubai

Asia and Pacific

Australia

Alan McNamara / Sydney
Bradley Hughes / Sydney
Chris Dorian / Perth
Gordon Christian / Agnes Water
Ikram Akbar / Melbourne
John Bassilios / Melbourne
Julia Buchholz / Perth
Lindy Chen / Brisbane

China

Albert Xuan / Shanghai
Brian Suin / Qingdao

India

Arnab Paul / Kolkata
Azmatullah Muhammad / Hyderabad
Bishal Goyal / Raipur
Darshana Parmar Jain / Pune
Rajesh D'Souza / Bangalore

Singapore

Oliver Siah / Singapore

North America

Canada

Kazim Kargi / Vancouver
Nathan Wosnack / Toronto

Mexico

Alejandro Velez / Mexico City
Carlos Vazquez / Mexico City
Enrique Suárez / Mexico City
Francisco Arias / Mexico City

USA

Bill Staniford / New York City
Brock Freeman / Seattle
Chris Deans / Dallas
Demitri Haddad / Salt Lake City
Eric Bryant / Los Angeles
Garratt Hasenstab / Denver
Gary Brandeis / Philadelphia
Geoffrey Kasselman / Chicago
Ian T. Staley / Seattle
John Dean Markunas / Miami
Ken Rhinehart / Pasadena (L.A.)
Lee Bratcher / Dallas
Lori Souza / Phoenix
Mark Kingston / Houston
Paul Ferreira / Boston
Peter Su / Silicon Valley
Ranganathan Krishnan / San Francisco
Sachin Kapoor / Houston
Todd Miller / Washington D.C.

South America

Argentina

Damian Lopo / Buenos Aires
Nestor Kreimer / Buenos Aires

Ecuador

Jaime Antonio Rumbea Dueñas / Guayaquil

Brazil

Rafael Stocco / Sao Paulo
Rubens Neistein / Sao Paulo

Colombia

Andrés Assmus / Bogotá

Notes