



THE PRACTITIONER PERSPECTIVE: TOKENIZATION OF REAL ESTATE

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Abstract

This study explores blockchain's potential in real estate development, focusing on the economic, legal, and technical framework for tokenization. Real estate development is a high-risk, capital-intensive process with long timelines. Blockchain can mitigate these challenges by dividing ownership and financial flows into digital tokens. Based on a literature review, the research examines the conditions for tokenization, suitable token structures, and its impact on project conception, considering different asset classes and property uses. Expert interviews are conducted to examine the necessary technical, legal and economic conditions for the implementation of tokenization in practice, additionally identifying both potential benefits and challenges.

Introduction

The development of real estate is traditionally one of the riskiest entrepreneurial activities within the AEC industry and is characterized by high financing costs and long project marketing periods. These challenges could be mitigated through the use of blockchain technology by dividing property ownership and investment into arbitrarily small digital shares, i.e., real estate tokens (Swinkels, 2023).

Real estate tokenization began in 2018 with the St. Regis Aspen Resort in Colorado, a pilot case on the blockchain. They tokenized 18.9% of the property, raising \$18 million by selling tokens at \$1 each to accredited investors. It's a solid example of how tokenization can unlock capital in high-end real estate. Through a Security Token Offering (STO) by Elevated Returns, investors gained access to rental income and potential appreciation (Baum, 2021; Buckton, 2023). "A security token is a digital representation of an investment product, recorded on a distributed ledger, subject to regulation under securities laws" (Lambert et al., 2022, p.302). Despite ongoing discussions and conceptual propositions for real estate tokenization in literature (Gupta et al., 2020; Khonashevych, 2020; Markheim and Berentsen, 2021; Liu et al., 2020; Zheng and Sandner, 2022; Alnabusi, 2024; Mottaghi et al., 2024), few projects have been implemented in practice so far (Schmied, 2024), among

others due to legal complexities, lack of regulation or standardization and technical issues. Swinkels (2023) analyzed liquidity and ownership of 58 real estate tokens in the US and found that tokenized properties average 254 owners, with ownership changes occurring annually. Kreppmeier et al., (2023) examined STO determinants of 173 real estate tokens and concluded that crypto-market-specific determinants, such as transaction costs and the related sentiment, are relevant both to the STO and capital flows.

Blockchain technology has been treated as a potentially disruptive innovation for many years, especially in illiquid markets such as the property sector, where it offers promising approaches for the financing and exploitation of real estate developments (Mottaghi et al., 2024; Schmid et al, 2024). Establishing clear frameworks could position tokenization as a viable financing and investment channel. Smart contracts may further enhance transaction security and efficiency, reducing costs and time for all parties involved.

Our ongoing research focuses on the question of conditions under which tokenization of a real estate project is possible and which token structures are most suitable. The here presented study identifies key parameters influencing tokenization and their impact on real estate development. Through a literature review and expert interviews, it examines the technical, legal, and economic conditions for practical implementation, highlighting potential benefits and challenges. Thus, the following research question are posed: *What legal, technical, and economic factors must be considered in real estate project tokenization? What are the advantages and disadvantages of tokenizing real estate projects?* Based on expert interviews, the findings will be presented in a table outlining these key conditions, benefits, and drawbacks.

State of the art

Blockchain and Smart Contracts

Described as a "decentralized database that stores a registry of assets and transactions across a peer-to-peer network" (Zwitter and Hazenberg, 2020, p. 3), blockchain fundamentally transforms traditional transaction

processing by enabling immutability, transparency, and programmability (Narayanan and Clark, 2017) within either a permissioned or permissionless network (Beck et al., 2018). In this decentralized structure, transactions occur directly between nodes—bypassing central authorities or intermediaries (Halaburda, 2018)—and are securely recorded in blocks using cryptographic techniques (Beck et al., 2018). If a smart contract is approved through the blockchain consensus process, it is considered valid and is automatically executed as a data-oriented or computable contract (Werbach and Cornell, 2017).

A key advantage of blockchain technology is its ability to ensure the accuracy of stored data without relying on intermediaries such as notaries or government institutions, thereby enhancing security and transparency in data transfers (Meinel and Gayvoronskaya, 2020). Smart contracts further reduce costs by automating processes, enabling transparent, self-executing transactions without the aforementioned intermediaries (de la Ruba et al., 2021).

Tokens

Blockchain tokens symbolize various scarce assets, including currencies, securities, properties, loyalty points, and gift certificates (Buterin, 2014). In contrast to coins, tokens are not connected to the blockchain per se, they are built on the protocol of an existing blockchain and governed by smart contracts (Massey et al., 2017). A token can also be described as a unique program code that links the token holder either inseparably with the ownership of an asset or with certain rights, thus offering the potential to challenge and simplify traditional trading structures and innovation in the economy (Chen, 2018; Culotta et al, 2021; Schmid et al, 2024). Hence, tokens can be endowed with value, rights, and obligations, similar to traditional forms of ownership, such as stocks or funds (Kreppmeier et al., 2023).

From a purely technical point of view, both a token and a coin are just an entry in a blockchain's data register, with many different tokens often accessing the same blockchain (EY, 2020). As the leading solution, the Ethereum blockchain is currently the most widely used blockchain protocol for creating tokens. Using distributed ledger technology, a wide range of assets, rights, algorithms or obligations can be digitally mapped in the form of a token in any unit size and made tradable.

At the moment, there is no generally valid legal definition of the term token in either Europe or the world (Austrian Federal Economic Chamber, 2022). The German BaFin (2022) defines a token as a digitized asset to which a certain value is assigned or which enables a specific function (Siegel, 2021). The EU has introduced a regulation to govern “Markets in Crypto-Assets”- MiCA (2023). The MiCA regulation, is intended to introduce an

EU-wide legal definition for the different types of tokens. The regulation covers crypto-assets¹ that are not currently regulated by existing financial services legislation. Key provisions for those issuing and trading crypto-assets (including asset-reference tokens and e-money tokens) cover transparency, disclosure, authorization and supervision of transactions. (ESMA, 2023)

In practice, token types are currently divided into currency (payment) tokens, utility tokens, security tokens and asset-backed tokens (Gupta et al. 2020; Kreppmeier et al., 2023). Depending on the type of token, certain tokens are to be understood as securities under Austrian law and are therefore subject to a regulatory assessment (EY, 2020).

Tokenization in Real Estate

Asset tokenization is the process of issuing a blockchain-based token, specifically a security token, that digitally represents a real, tradable asset (Gupta et al., 2020). It typically involves the process of converting ownership rights in these assets into digital security tokens on a blockchain, allowing them to be publicly offered through a security token offering (STO). Standardized token protocols like ERC-20 and ERC-1400² enhance interoperability across platforms, promoting scalability and reducing development costs. This also enables international investment in tokenized real estate, ensuring legal transaction security through uniform standards (Berentsen and Markheim, 2020).

When it comes to fractional property rights, smart contracts provide a practical framework by leveraging their transparency, immutability and automation. Platforms like RealT tokenize real estate, allowing investors fractional ownership, hence lowering investment barriers and enabling smaller investors to participate (Swinkels, 2023; Kreppmeier et al, 2023). In RealT, the smart contract ensures compliance with local regulations (via encoded rules or off-chain oracles) and manages payouts. If a property earns \$10,000 in rent and one owns 5% (5 tokens), the contract sends this owner \$500 worth of crypto with no paperwork and no delays (<https://realt.co/>). This democratizes the market and provides project developers with new liquidity channels, including international investors. If a secondary market emerges, tokenization could enable flexible trading of real estate shares and real-time price adjustments, similar to the stock market (Schmid et al. 2024).

Real estate transactions involve high costs due to multiple intermediaries, directly linked to property prices. De la Ruba et al. (2021) define real estate tokenization as using securities and financial instruments to tokenize property, highlighting potential cost savings in ownership transfers. In the context of real estate tokenization, de la Ruba et al.

¹ https://finance.ec.europa.eu/digital-finance/crypto-assets_en

² <https://thesecuritytokenstandard.org>



Figure 1: Direct tokenization of property ownership (left, narrow definition) and indirect tokenization of property ownership (right, broad definition), ©Frankfurt School Blockchain Center und Hamburg Commercial Bank

(2021) differentiate between a narrow and a broad definition (see Figure 1). The narrow definition pertains to the direct tokenization of property ownership, meaning that token holders acquire a direct, securitized share of the real estate asset. The broad definition, on the other hand, encompasses tokenized securities such as shares, loans, or participation rights, which grant contractual claims to a portion of the income generated by a tokenized or digitally securitized property.

In practice, indirect tokenization prevails due to the lack of digitalized land registries. Although direct tokenization is often proposed as a marketing tool, it is rarely implemented (Petrikovics, 2022). Indirect real estate tokenization involves tokenizing various financing instruments, generally categorized into equity and debt, each with distinct legal implications. The choice of instrument depends on the developer's business model - whether retaining properties for rental income distribution to token holders or selling them post-development.

Tokenized financing instruments provide holders with contractual claims to income and potential appreciation. Equity tokenization involves issuing shares or participation certificates, whereas debt tokenization typically includes bonds or loans with fixed or variable interest rates. Table 1 clarifies the distinction between tokenized & crowdfunded financing options for better understanding and offers context for the tokenized approach.

Table 1: Comparison between tokenized financing & crowdfunded loans

COMPARISON*	
Tokenized financing	Crowdfunded loans
<ul style="list-style-type: none"> Cost Structures 	
<p>Costs primarily stem from blockchain-related expenses—smart contract development, platform fees, and regulatory compliance (e.g., KYC/AML requirements). Initial setup can be high (e.g., \$10,000–\$50,000+ for tech and legal structuring), but ongoing costs are often lower due to automation and disintermediation.</p>	<p>Costs include platform fees (typically 1–5% of funds raised), interest payments to lenders (often 5–15% APR depending on risk), and administrative expenses (e.g., credit checks, legal docs). For example, platforms like LendingClub or Funding Circle charge borrowers fees plus interest, which can total 10–20% of the loan over its term.</p>

Intermediaries	
<ul style="list-style-type: none"> No traditional intermediaries like banks or venture capitalists mean fewer fees (e.g., bypassing 2–5% bank loan origination fees or VC management fees). However, volatility in token value can indirectly affect costs if fundraising targets shift. 	<p>Intermediaries add overhead, but setup costs are generally lower than tokenized financing since the infrastructure (e.g., lending platforms) is pre-existing.</p>

Timelines	
<p>Fundraising can be rapid once infrastructure is in place—token offerings (e.g., ICOs or STOs) often close in days or weeks, assuming regulatory approval and marketing are ready. Setup, however, takes longer: 2–6 months for smart contracts, compliance, and token issuance. Post-funding, liquidity is immediate if tokens trade on exchanges, though market adoption can delay real-world use.</p>	<p>Campaigns typically run 30–60 days on platforms like Kickstarter (for rewards-based) or peer-to-peer lending sites. Approval and disbursement add another 1–4 weeks, depending on underwriting (e.g., assessing borrower creditworthiness). Total timeline from application to funds in hand is often 1–3 months. Repayment schedules (e.g., 1–5 years) lock in longer-term commitments, slowing capital flexibility compared to tokenized liquidity.</p>

Potential Returns for Investors	
<p>Returns depend on token appreciation or utility. Successful projects (e.g., Ethereum's ICO) have delivered 100x+ returns, but many fail or lose value—high risk, high reward. Investors can trade tokens early, offering liquidity not found in loans. For issuers, returns come from project success without debt repayment, though dilution of token value is a risk if oversold.</p>	<p>Returns are predictable—fixed interest rates (e.g., 5–15% APR) over a set term. Platforms diversify risk by pooling loans, but defaults can erode gains (historical default rates on P2P loans range 3–10%). For borrowers, there's no "return" per se, just capital access with repayment obligations. Upside is capped compared to tokenized equity-like potential.</p>

Key takeaway	
<p>Choosing tokenized financing makes sense if one prioritizes speed of capital deployment after setup, aims to avoid intermediaries, and seeks high-growth potential (e.g., tech startups or blockchain projects). It suits risk-tolerant issuers and investors comfortable with volatility. Conventional crowdfunded loans fit better for those needing simpler, predictable financing with lower entry barriers—ideal for small businesses or projects with stable cash flows unwilling to gamble on token markets. The trade-off is flexibility and upside versus stability and accessibility.</p>	
<p>* Summarized from different resources: coindesk.com; cointelegraph.com; messari.io; ethereum.org; lendingclub.com; fundingcircle.com; prosper.com; kickstarter.com; deloitte.com; pwc.com; worldbank.org; imf.org</p>	

Real estate developers face regulatory, capital market, and tax challenges when implementing indirect tokenization. Depending on design and functionality, token issuance

may require licensing or investor protection compliance. One strategy could be to adopt a proactive compliance framework that aligns with international standards, such as those from the Financial Action Task Force (FATF) or the European Union’s MiCA regulation, even if local rules are still vague. Firms could also leverage self-regulatory organizations (SROs) to establish industry benchmarks, offering a layer of credibility while awaiting formal guidelines. Security tokens often constitute a public securities offering if they confer rights to future real estate income or governance. In such cases, EU Prospectus Regulation mandates disclosure of token terms to potential investors. Developers must assess whether financial market authorities need to be involved in the tokenization process (Deichsel et al., 2022; ESMA, 2019).

Beyond indirect tokenization, the potential to tokenize real asset ownership and create active secondary markets is growing. Tokenization enhances real estate liquidity, enabling broader investor participation and diversified investments with smaller capital. However, two key factors are necessary: (1) demand for fractional ownership of real estate assets and (2) market confidence in blockchain technology. Additionally, legal and structural barriers, such as the need for intermediaries in some land markets, increase tokenization costs. Larger assets already held in fund structures may see successful tokenization, as may alternative markets like community assets, where investment regulation and risk/return are not the main drivers. However, mass tokenization of single commercial real estate assets remains a longer-term prospect. (Baum, 2021).

Method

The study builds on theoretical foundations in real estate development, blockchain, and tokens to assess the current state of tokenization in AEC. Given the limited number of real-world case studies, qualitative research was chosen as the most suitable method. To explore the research questions, problem-centered expert interviews were conducted following Witzel’s (1985) methodology. Selecting interview partners for this study proved challenging due to the limited number of experts with practical experience in tokenization combined with real estate development in Austria. The focus shifted to 6 experts with experience in advisory or entrepreneurial roles related to tokenization and/or real estate development. The final selection included a **service developer** with initial experience in tokenization for real estate, a **tax and a legal advisor** with expertise in tokenization, a **digitalization expert and entrepreneur** in the real estate industry, a **real estate service provider** active in both real estate development and tokenization, and a **IT provider and entrepreneur** in tokenization.

The interviews followed a semi-structured format, with general questions posed to all experts for a broad perspective and specific questions tailored to each expert’s field. The interviews were then transcribed and analyzed to extract key findings. The evaluation of the

expert interviews revealed 23 codes, organized into three levels of subcodes (see Table 2). These were categorized and interpreted to highlight significant findings across five main areas: economic, legal, and technical framework conditions, and the advantages and disadvantages of tokenization in project development.

Using MAXQDA software, all coded text passages were compiled into a codebook. A total of 79 text passages were assigned to the technical framework, 48 to the legal framework, and 38 to the economic framework. Additionally, 25 statements were categorized under the advantages and disadvantages of tokenization in real estate project development. Through an iterative process of inductive category formation and reliability checks, subcategories up to the third level were developed to allow separate analysis of key passages. The interviews revealed that technical, legal, and economic conditions are often interdependent, leading to passages being assigned to multiple main categories and subcodes. The following table displays the developed code system and the frequency of each code.

Table 2: Overview of the category system

Level	Category	Frequency
1	Economic conditions for tokenization in real estate development	38
2	Definition of tokenization of a real estate project	8
2	Token design and structuring	-
3	Distribution modalities and smart contracts	6
3	Divisibility of a real estate project	8
2	Initial costs of tokenization	3
2	Potential buyers of tokenized real estate projects	13
1	Legal framework for tokenization in real estate development	
2	Choosing the right token type	24
2	Tax implications of the tokenization of a project development	7
2	Financial market supervision and legal requirements	10
3	AIFG and possible solutions for project developers	7
1	Technical framework for tokenization in real estate development	79
2	The real estate development process	-
3	Controllable standard processes as a prerequisite	4
3	New tasks for real estate developers	6
3	Timing of tokenization in the project development process	12
3	Participants in the real estate development process	13
3	Tokenization as an integral part of the project design	22
3	Influence of tokenization in project management	2
2	Availability of suitable real estate projects for tokenization	20
1	Potential disadvantages of tokenization	25
1	Potential advantages of tokenization	22

Analysis and interpretation of the results

Economic, legal and technical conditions

Due to the current lack of practical examples and standardized regulations in Austria, the economic, legal, and technical framework conditions for tokenization in real estate development can only be defined in theory rather than as established industry standards. Nevertheless, experts across these three domains—technical, legal, and economic—have identified key parameters essential for implementing tokenization in real estate projects.

Before tokenizing a real estate development, it is crucial to assess the project's existing technical parameters, as these determine the feasibility and scope of tokenization. The most significant technical factors include the stage at which tokenization occurs within the development process, the total project volume being tokenized, the intended use of the property, and the project developer's monetization strategy. These elements serve as the foundation for defining the legal framework.

Currently, real estate tokenization is primarily a legal issue, as the financial market supervisory authority plays a central role in determining regulatory compliance. Since real estate itself cannot yet be tokenized under property law, tokenization typically involves company shares or financial instruments that may grant ownership-like rights, contractual claims to interest payments, profit-sharing, or governance rights. These tokenized assets can be publicly offered as securities through a Security Token Offering (STO), allowing project developers to enter new, regulated financial markets.

One of the most critical legal considerations is selecting the appropriate "token type," which depends on whether token holders will share in profits from property sales or rental income, or receive a fixed return on their invested capital. The nature of the tokenized security is directly linked to the developer's business model. If a real estate project is partially or fully monetized through token holders—such as by allowing participation in rental or leasing income—the Investment Fund Act often comes into play, requiring additional regulatory compliance measures during project development. To avoid restrictions under this Act, developers may adopt alternative models, such as structuring income streams from operational activities or designing governance frameworks that provide token holders with substantial decision-making rights.

Additionally, compliance with capital market disclosure requirements is essential. Depending on the total tokenized project volume, developers may need to prepare a capital market prospectus, which can significantly impact project costs and timelines.

The following Tables 3 - 5 summarize the most important economic, legal and technical conditions derived from the interviews with a brief explanation.

Table 3: Economic conditions

Economic conditions for tokenization in project development
<ul style="list-style-type: none">• Initial costs <p>The initial costs of a tokenization result from the consulting fees for the conception of a suitable "token type" and the legal requirements that need to be met. The initial costs depend in particular on the size of the project, since different information requirements, such as the preparation of a capital market prospectus, are necessary depending on the amount of the tokenized project volume.</p>
<ul style="list-style-type: none">• Division of the real estate project (depending on the choice of a suitable "token type") <p>Real estate projects can be divided into fractions of any size through tokenization. Depending on the concept, a token can represent a specific condominium property or a condominium property can be broken down into fractions or tokens of any size. In addition to the project objectives, the target buyer group and the distribution modalities also influence the size of the real estate share per token.</p>
<ul style="list-style-type: none">• Distribution modalities <p>The distribution modalities depend on the form and frequency of the remuneration of the token holders and can be processed automatically via smart contracts. As soon as tokens represent the smallest real estate shares, small investments are accepted and the distributions take place with high regularity, a blockchain with low transaction costs is advantageous.</p>
<ul style="list-style-type: none">• Potential target group for tokenized real estate <p>Due to the low level of awareness and the complex handling, tokenized real estate projects are currently mainly attractive for private investors who are familiar with the application area of blockchain and DeFi. Mass suitability can only be achieved once user-friendly offers have been established and sufficient public relations work has been carried out.</p>

Table 4: Legal conditions

Legal framework for tokenization in project development
<ul style="list-style-type: none">• Choosing a suitable "token type" <p>Since the tokenization of real estate shares is not yet legally recognized under property law, company shares or financial instruments are currently being tokenized and offered to potential buyers through a Security Token Offering (STO). The selection of an appropriate "token type" depends on whether the tokenization serves as a project financing model—with a fixed interest rate on the invested capital—or as a profit-sharing model, where token holders participate in the project's financial gains and potential value appreciation. Due to the high degree of regulatory complexity, rights-based token structures are often preferred for real estate tokenization, allowing for efficient exploitation and investor participation.</p>
<ul style="list-style-type: none">• Tax implications for token holders and project developers <p>Depending on how they are designed, tokenized real estate shares can be transferred to new owners without triggering real estate transfer tax, since there is usually a purely contractual relationship between the project developer and the token holder and the project developer usually remains the owner of the real estate.</p>

- **Duty to provide information**

Since security tokens are securities, they are subject to the information requirements under capital market law. Depending on the size of the project and the tokenized project volume, the preparation of a capital market prospectus may be required (from volume > EUR 5 million in 12 months).

- **AIFG (Alternative-Investmentfond-Gesetz)**

As soon as a real estate project is realized through tokenization, in that the token holders participate in the profits of the real estate project and receive a share of the potential appreciation of the real estate project, the Investment Fund Act must generally be observed and the project concept adapted accordingly. Possible solutions include a type of use of the real estate that allows for income from operating activities, or comprehensive co-determination rights for token holders.

Table 5: Technical conditions

Technical conditions for tokenization in real estate development (implementation of the legal and economic conditions in the project development process)

- **Timing of tokenization in the real estate development process**

The early implementation of tokenization in the project development process creates numerous application possibilities. In this context, it is important to distinguish between when the measures to fulfill the legal framework are designed and when the tokenization with the token sale takes place.

- **Tokenized project volume**

The size of the project and the associated amount of the tokenized project volume determine the scope of the capital market information requirements and the associated additional financial and and time-related additional expenses.

- **Project financing / exploitation model**

Tokenization can be used either for project financing with a fixed or variable interest rate on the capital raised or as a monetization model in which token holders participate in the profits of the real estate project and receive a share of the potential appreciation of the real estate project. As soon as the tokenization is used for project exploitation, the AIFG must generally be taken into account and the real estate project adapted accordingly.

- **Type of use of the real estate**

The asset class or the type of use of the property determines whether income from an operational activity can be shown and thus a classification as an AIF can be avoided if the project development is realized via tokenization.

- **Additional tasks for the project developer**

The following tasks must be carried out by the project developer to implement tokenization:

- Development of the token concept and IT infrastructure
- Training of employees
- Administration of token holders
- Management of IT infrastructure and cash flows

- **Stakeholders involved in the project development process**

- ...which are required to implement tokenization:
- Specialized consultants (legal, economic, IT)
- Specialized internal employees
- Marketing agency
- Licensed sales partners
- Token holders

- **Manageable standard processes**

The implementation of tokenization should be based on manageable standard processes in building planning and construction in order to create a secure investment framework for the token holders. to create a secure investment framework for token holders.

Tokenization in real estate project development has the potential to permanently change the construction and real estate industry by digitalizing real estate projects. The key advantages (Table 6) of opening up the real estate market to a broad target group without costly bureaucracy and combining project financing with project realization create new opportunities for project developers, especially in economically challenging times. On the other hand, there is still a lack of public trust in the underlying blockchain technology, a lack of standardization of the legal framework and the currently still complex applicability (Table 7).

Table 6: Potential advantages

Potential advantages

- Divisibility of real estate property
- Lower entry threshold for ordinary consumers into the real estate market
- Simple tradability of real estate shares
- Easier access to international capital flows for project developers
- Additional real estate project utilization options
- Additional financing channel for real estate projects
- Tax optimization opportunities
- Cost savings through process automation
- New business models for project developers
- Security for transactions

Table 7: Potential disadvantages

Potential disadvantages

- Additional expenses in project marketing
- Little trust in the technology
- Currently still specific target group as buyers
- Lack of practical experience and no clearly defined legal framework
- Lack of standardization and efficiency
- High initial costs
- Currently still complex application
- Tokenized real estate projects are currently still not very intuitive compared to traditional real estate
- Possible total loss of tokens through incorrect use
- Possible data protection disadvantages

Discussion and Conclusion

Expert interviews highlight that smart contracts provide a time-saving, cost-efficient, and secure method for distributing returns to investors in tokenized real estate projects. However, the project's structure and the compensation model for token holders must be carefully considered. If tokenization is used solely for project financing—where investors receive a one-time payout after the property is sold—cryptocurrencies like Ethereum can be utilized despite high transaction fees. However, for projects where token holders receive ongoing rental income and even small investments are accepted,

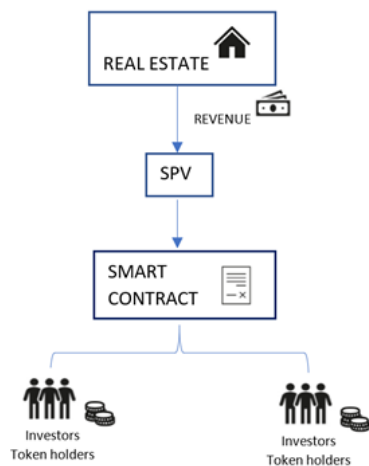


Figure 2: A Special Purpose Vehicle (SPV) holds the property deed as an independent legal entity and is then tokenized using e.g. Ethereum ERC-20 standard.

blockchains with lower transaction fees should be prioritized to facilitate frequent micro-payments efficiently (see Figure 2). With the current level of knowledge and public awareness, real estate projects with manageable volumes and low-risk asset classes are best suited for tokenization, particularly when standard construction and planning processes remain predictable, ensuring minimal risk transfer to token holders.

While real estate tokenization is still in its early stages, it has the potential to transform the construction and real estate industries by leveraging digitalization and creating new opportunities for value generation. A key success factor in this transformation will be the development of a standardized legal framework, allowing tokenization to evolve into a reliable financing and investment tool beyond complex, case-specific applications. However, public perception continues to associate tokenization with the volatility of cryptocurrencies rather than the secure applications of blockchain technology. To encourage adoption, user-friendly platforms must simplify access and build trust, especially among non-tech-savvy investors.

This research emphasizes that standardized solutions will only emerge when tokenization is fully integrated into the real estate development process, requiring expertise across technical, legal, and economic disciplines. Moreover, current challenges in the construction and real estate sectors could serve as catalysts for innovation, accelerating the adoption of blockchain-based financing models. This paper explores both the potential and challenges of tokenizing property-like rights in real estate projects and provides a framework to guide practical implementation and future evaluations of its feasibility.

Ultimately, the findings highlight blockchain technology's significant potential in real estate development, enabling the creation of new business models. However, a standardized application of this technology can only be achieved when tokenization is treated as an integral part of the entire development

process. The legal framework, in particular, plays a critical role in ensuring that tokenization is implemented at the right stage of development to address regulatory complexities proactively. If tokenization is only considered after project completion, its benefits may be significantly limited due to delays caused by necessary adjustments in governance structures, compliance requirements, or capital market regulations.

Beyond legal considerations, economic factors such as distribution mechanisms, asset divisibility, and the target investor group also play a crucial role. The choice of a "token type" directly influences these aspects, linking economic feasibility with the legal framework. A successful tokenization strategy requires a holistic approach, recognizing the interdependencies between technical, legal, and economic conditions. To optimize tokenization in real estate, project developers must first establish a strong economic foundation, upon which a legal framework can be built and subsequently integrated into the technical development process.

Future research directions should include investigation on how to cultivate mainstream awareness for a broader adoption of tokenization; as well as a cost-benefit analysis of real estate tokenization evaluating potential benefits of converting real estate assets into digital tokens on a blockchain against the costs associated with implementing and maintaining this process. Capturing perspectives of stakeholders involved in the real-estate development process (such as regulators, end-users) is also important in this context. Taking a deeper look at successful real-world examples is a necessary future step in our ongoing tokenization research.

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