

German version  
03/27/2019

## Statement by FinTechRat on

### Blockchain strategy of the Federal Government

#### in the context of the public consultation

#### preamble

**Blockchain strategy of the Federal Government.** The federal government is planning a blockchain strategy and as part of this, a public consultation will be carried out, inter alia, by means of a detailed questionnaire. With this document FinTechRat <sup>1</sup> would like to comment on the questionnaire of the Federal Government regarding the planned blockchain strategy <sup>2</sup>. In addition, the TechRat on the key issues paper of the Federal Ministry of Finance (BMF) and the Federal Ministry of Justice and Consumer Protection (BMJV) on the regulatory treatment of electronic securities and crypto-tokens. In any case, the FinTechRat highly appreciates the fact that the federal government is planning a blockchain strategy.

**Regulatory context as the primary focus of this opinion.** The FinTechRat focuses in this opinion, in particular, but not exclusively, on aspects that are regulatory in nature. Concrete implementation - related measures catalogs of the strategy are therefore not available. Focus of this opinion.

**Illustration of the euro on a blockchain system.** In the context of a future-oriented law on digital currencies, we would also like to focus in particular on the Euro-on-Ledger in particular, and cash-on-ledger in general, which topics such as official currencies based on DLT in the form of e-money, commercial money or even central bank Digital Currency (CBDC) includes. Different variants are conceivable, but also have different problems and systemic risks (see chapter on the security of blockchain systems and see Chapter on the General Data Protection Regulation). Almost all areas designated by the federal government (eg Industry 4.0, IoT, Energy, Logistics and Mobility) are not without a reference to digital currencies on DLT basis. <sup>3</sup> Despite the importance of this theme, we will, before the background, that this complex of topics already in different places, eg central banks extensively analyzed and partly implemented as part of a test, within the scope of this document do not give a comprehensive opinion on this. It should also be mentioned that several companies in Europe have already tested "Euro-on-Ledger" with e-money license and conducted test bookings

1 For further information on the FinTechRat of the Federal Ministry of Finance see at the end of this Document.

2 This document uses the terms "blockchain" and "distributed ledger technologies" (DLT). all forms of technology are treated simultaneously as a distinction for most of our Statements is not effective.

3 Of course, the connection of legacy systems via an interface is possible.

to have. The Federal Government should be advised to pay special attention to these projects as confidence in the euro must be avoided. The requirements can also be met by an interface into the existing banking system. In any case, the topic should be the integration or connection of the euro into blockchain systems due to their importance for the German industry and the financial sector as part of the Federal Government's blockchain strategy be taken up and further investigated.

### Summary of the most important recommendations

Before aspects are detailed, below are the main requirements summarized:

- **Technology -neutral regulation:** An important part of the blockchain strategy is a technological-neutral regulation of blockchain technology. We recommend, if possible, it is important to seek regulation that is detached from technical implementation, in particular is detached from a concrete expression of the blockchain technology used.
- **Focus of regulation on providers and service providers:** Regulation should, above all, be the focus on vendors and service providers who interact with blockchain systems. These should take responsibility for their offers and should therefore be responsible for this and for the risks they adhere to the technology used. Such providers and service providers are about securities, providers of custodial solutions or service providers representing the real world connect with tokens (eg connection of machines via IoT). The state should also be aware of the fundamental problems for the enforcement of constitutional claims and deal with blockchain systems.
- **Quick regulation and rapid development of the blockchain strategy:** Due to the dynamism in the field of blockchain technology and also because of the importance of the technology, it should be required with the definition and implementation of the blockchain strategy that regulatory measures are swiftly implemented.
- **European regulation:** certain measures will certainly be on the ground in Germany, however, we would like to stress the importance of regulation at the European level. In that respect, the blockchain strategy should focus on action at this level and emphasize the low level. Some problems also require international regulation in order to avoid regulatory gaps or close them. In addition, it should be avoided that the lack of EU-wide regulation within the EU "oases" for blockchain-based securities arising from the respective national laws of the other member states could.
- **Dematerialized Securities:** Getting Started with the Introduction of Electronic Securities already exists with the key issues paper of BMF and BMJV. This way should continue in a timely manner to dematerialize all types of securities swiftly. This concerns not only the mostly customary duty to document, but also any written form requirement.

se. Here, as currently required, a proper registration must be ensured become.

- **Data protection aspects:** With regard to existing data protection rules, the Blockchain's strategy to clarify the interpretation of the privacy rules plan to one To assess compliance with blockchain technology. An information right of one Formulating operators, passes a decentralized operatorless blockchain, can

but be regulated by the public availability of the Blockchain easily different.

It should be clarified that so-called hash values and public keys are not nated data if the original data can not be reconstructed from it.

- **Promoting education:** Sustainable DLT innovations require an interdisciplinary approach Training in information technology, digitization and programming. Also linked important areas, which until today have only a niche existence, are important here (eg cutting Computer Science and Law, Interface Informatics and Engineering). The training in DLT at universities, research institutes and relevant companies should therefore be be promoted. This not only applies to higher education, but also to the continuing education education in the course of working life.
- **Abstract definition of token requirements:** tokens will become more diverse in the future Variety occur. This requires the most abstract regulation possible. So not only will tokens be used in the form of security tokens to digitally transfer securities to blockchain securities. To map systems. Tokens could also represent a government currency such as the euro or certain rights, such as access to a rented vehicle. Because of too The expected breadth of applications would be application-specific regulation not effective. We therefore recommend the rules of the right pictured in a token to remain as unchanged as possible and to bring it to the fore. This would also automa-answer open questions such as taxation. But, as it were, find valid rules for tokens that address general issues of ownership as well as Transfers and misconduct (eg theft, fraud) concern. These regulations can be taken so technology neutral that other systems in addition to the currently in debate standing blockchain fall under it.
- **Research field for Germany and the European Union:** The rapid technological Further development of the blockchain is operated by the industry. However, the question becomes which properties the blockchain would need to conform to the regulation, until too little tracked. A research project in this direction would therefore potential to strengthen Germany as a business location and options between technology and regulation. Especially for certain questions (eg quality parameters / safety levels of blockchain Systems, assessing the reliability of blockchain systems) is currently available. point no widely reliable basis for decision-making. Such assessments, however, are required, for example, to the blockchain security register for electronic bonds are to be formulated. So these research topics are to tackle quickly. Therefore, we advise certain specific issues focused within the framework to answer further analysis. That should then be incorporated into the blockchain strategy or accompany them in the coming years.

## introduction

**Relevance of technology to politics.** The Federal Government wants a comprehensive blockchain strategy with a well-defined political agenda and a legal framework to promote the innovative strength of Germany in this area and the future competitive position of Germany with regard to digitization. Driving factors for this include the already a noteworthy position reached by German companies (startups and established companies) in the field of blockchain. In addition, the assessment that it is in the

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Blockchain technology is a key technology over the next 3 to 15 years. The way of doing business and coordination could completely change a first milestone.

**Main application fields of DLT.** Applications are found using distributed ledger technologies (DLT) especially in the areas of "Finance & Assets", the so-called "Machine Economy", all registers (eg Commercial register, land register, reporting system, and especially the identity of persons and things) as well as Data monetization. In addition, deployment in developing countries is also conceivable. The "Machine Economy" deals with the secure connection of billions of devices to the Internet and perspective on payment transactions. For developing countries, DLT - and especially Crypto Assets - helping to achieve Financial Inclusion goals. This acts it is about providing simple or even more complex financial services for two to three billion people who currently have little or no access to payment infrastructure or banking services.

**Sustainability of legislation.** We as FinTechRat welcome the targeted legislation expressly and in the following would like a structured assistance for an efficient legislation offer to face the challenges of the future in terms of blockchain technology and more digital, distributed systems for maintaining registers or for recording transactions, in the General DLT, to master for use in the real economy. It is the blockchain Technology around a special subcategory of DLT. Our estimates are for this Ecosystem on both blockchain technology in particular and on DLT in general and are therefore not always explicitly differentiated in the following.

**Modular structure.** Due to the various application possibilities, the demand for a modular, structured, comprehensive and flexible legal framework. The enormous global dynamics of technology is mainly driven by the open-source nature and transparency of publicly accessible blockchain systems of crypto assets. As part of the Legislation needs to capitalize on existing developments and force, but at the same time the associated and listed in this document Counteract risks. For any certification beyond the legal scope of tesse can be called meaningful applications in the field of smart contracts and IT security, but these are less useful for other processes. It is important to have an efficient cost-benefit Find relationship for the respective fields of application and the main focus on an abstract or to lay down universal regulation of tokens.

**Existing regulation as a foundation.** From our perspective, it is crucial to universal regulations for these digital, decentralized exchange and contract processes. to redefine it and either interpret or approve the existing regulations complete. It is important to promote the range of these technologies and to have a legal and organizational framework, where the processes of a central actor or a

man, such as a bank, stock exchange or platform, potentially represented by a DLT system can be. Intermediaries will continue to have important tasks, eg as gateway Provider, technology provider, contact for the state, as responsible for the attention regulatory requirements, in particular anti-money laundering rules.

**Strengthening innovation through legal security.** Overall, the goal should be Focus primarily on regulating rights, claims and things of the "real" world through a DLT Infrastructure can map - with the associated application fields. With this big one Range of applications arise in some places profound legal

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Issues that need to be clarified in order to swiftly settle legal issues for application in the economy. safety. This legal certainty is crucial for the economy (especially industry) to utilities, financial organizations and startups) and public administration DLT-based systems and quickly develop applications on site in Germany and put them into operation.

**Necessity of a fundamental analysis.** Bitcoin is now ten years old and shows exemplary adhere to the potentials, successes and problems of the new Blockchain or DLT. For the existing one The legal and economic system is problematic in that this technology is subject to regulatory access through distributed, dynamic and transnational operations. The idea, instead of a Legal framework to use the rules coded technically in the system as the absolute reference point, seems attractive at first sight, but is highly problematic. Every logical system is incomplete, as has been demonstrated by formal reasoning (eg Gödel incomplete keitssatz). This could also apply to DLT systems. The example of "The DAO" is clearly too see that not all cases can be considered in advance or that errors exist in the system. their Treatment or rewinding is not provided for in such systems. The technical System opposes virtually a legal order or correction and undermines the sovereignty of Legal system by anonymous participation in a system without owner or operator. insofar shakes this new technology at the foundation of the existing economic and legal system.

**Compatibility of IT and jurisdiction.** It is now the question of whether in the course of technical Progress in further development, in particular of the operatorless blockchain technology used for the Legal system to create intervention possibilities in the technology, or whether the conflict between the legal system and technical systems remains irretrievable. In any case, the Which system can prevail over each other? Moral is the to demand human sovereignty over the technical system, it will be practical to show which ones Followers and whether people are prepared to attribute technical dysfunctions to human preferable to wrongful judgments. At the moment, many cultures seem more inclined to believe in technology.

**Risks and opportunities at the interface between business models and new technological implementation.** Regulation in this area is necessary as regulated areas such as finance affected, but do not take into account existing DLT applications. are satisfied. The rules of consumer protection must also be implemented in the DLT system become. That is why it is important to ensure that business models on the blockchain are regulatory Meet requirements. Here is to reconsider, to what extent the respective regulatory requirements for the new technology to modify. In principle, it should be strived for, that the regulation technology-neutral and does not have to be adapted to new technological developments. However, the regulation should focus on risks that arise specifically from the technical implementation- that, and they are difficult to predict in advance.

## definitions

**Different types of blockchains and DLTs.** Developing a vision to the general Topic Blockchain is complex because there are many types of blockchains and DLTs: public (public) Blockchain systems, private blockchain systems or Federated Blockchain systems, with or without tokens, etc. An assessment or even finding new rules is therefore difficult and sometimes impossible, because of scalability, applicability, transaction costs, security, etc.

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depend on what characteristics of a blockchain system we are talking about.

**Ratio of blockchain and DLT.** In our feedback we take into account the full scope of the DLT protocols and their applications, of which Blockchain is a subset in the strict sense. A definition of Blockchain or DLT is accordingly:

*"A protocol for synchronizing a decentralized database consisting of a distributed ledgers, where the changes 1) are replicated and not changeable, 2) secured by cryptography and 3) can be automated (through smart contracts)."*

**Distinction between public and private blockchain systems.** The discussion about Blockchain is enough So from the functionality and application of public blockchains like Ethereum - open, largely in the Use, but with important scaling problems that need to be resolved - right down to private DLT Protocols (eg Hyperledger or R3 Corda). The latter are not completely decentralized, but stand highly scalable today. Besides these examples of general blockchain protocols for which various Applications can be programmed, there are many special blockchain protocols for one specific company, a specific use case or a specific industry can be.

Overall, we see two very different areas where Blockchain or DLT with completely different dynamics is applied:

- **Public Blockchain Systems** : These are completely distributed technologies and include typically a system-inherent crypto-token. Often they are made by means of an initial Coin Offering (ICO) funded. These systems are the basis for the development of open Applications, often by startups, that can take a very disruptive approach (eg Disintermediation of certain industries).
- **Private Blockchain systems** : These are primarily DLT protocols for enterprises. applications (or in the context of public administration) with specific authorization management options. They generally do not contain crypto tokens. These are the basics for novel use cases in companies that are more frequent by or by established companies - alone or in consortia.

It is important to avoid that the discussion is mainly on the former, subjectively possibly as the "current" perceived variant, concentrated, although the latter already in many different Industries will lead to market applications.

## Token economy

**Abstract definition of tokens.** "Token" is associated with blockchain use cases, especially platform-based use cases, often used but not clearly defined term. In particular, since the use of the term "token" in digital applications cases of the "real" world and in the context of purely blockchain-based use cases the first glance could be perceived as very different, we will follow this illuminate separately two facets of the term "token", then a congruent treatment work out. With these two terminologies, we initially limit ourselves to the blockchain

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Implemented use cases (eg payment transactions based on crypto assets) on the blockchain for the digitization of existing rights, things or claims (eg Euro payments on the blockchain).

**Digital mapping of arbitrary rights through tokens.** However, we would like to introduce you to one very clear definition of the term token in the context of a first bill, <sup>4</sup> which in a few months in Liechtenstein should come into force. Generally, tokens in the sense of Definitions are not a sole right in a digital context, but rather should be considered as one platform-based shell or container. This may be "claims or member rights to a person, rights to property or other absolute or relative rights embody." <sup>5</sup> An example of this is ownership of a (physical) asset or asset Securities. Other examples range from traditional currencies (eg Euro, US dollars) to tokens intellectual property rights all the way to tokens, the real assets (eg machines, cars etc.). Within this framework, the specific, tokens, Rights, such as capital markets law. Third parties interacting with the tokens (eg in the context of a safe custody, trade, evaluation or also connection of identities to persons / companies / objects), should in a possible legislation turn in addition separate, service-related rules will be subject to case-law at all Ensure levels. We will follow this argumentation of this text in large parts.

## Token economy: tokens in real world applications

**Enormous economic potential.** A key value proposition of the blockchain is real Goods and assets of all kinds in digital form legally safe storable and between arbitrary parties, possibly also with the elimination of today's intermediaries, tradable or to make transferable. According to current opinion, the construct of the (digital) token appears a suitable means of achieving this goal. The token represents the real value or counterparty standing or immaterial law in the digital world on the blockchain. In the following, we become values, Objects and immaterial rights, eg real estate, automobiles, shares, license rights under the Subsume the term "value". Nevertheless, the owner of the token has all rights and Duties that also result from owning the corresponding value in the real (non-digital) world

would result. To ensure this, it is of paramount importance to ensure the legal certainty of Transformation of the "real" value into a token, to ensure. This process will too Called tokenization. Generalized one speaks of the resulting implementation of the token economics.

**A proven concept in a new coat.** The concept of the token is not a new concept, yet the tokenization based on the blockchain promises to open up new economic opportunities and Realize efficiency potential. An illustrative example of this is money (ie, the euro) on the Blockchain (see below).

<sup>4</sup> The document "Government consultation report concerning the creation of a law on trusted technologies (VT) based transaction systems (Blockchain law, VT law, VTG) and the amendment of other laws "is available via <https://www.llv.li/files/srk/vnb-blockchain-law.pdf> .

<sup>5</sup> See footnote 7, p. 87.

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**Benefits of tokenizing.** Benefits seen due to the tokenization of real values are, among others

- Traceability of the transfer of value from owner to owner;
- simplifying the transferability of values and possibly reducing the associated costs overhead costs;
- Increasing the liquidity of tradable assets through easier divisibility, eg it would be through the almost arbitrary divisibility of tokens u. U. easier to smaller share of real estate too sell;
- The ability to merge currently physically separate markets and thereby opening up increased transparency but also the possibility of creating new products.

**Categorization of legal problem dimensions.** Legal and regulatory issues to consider in the context of tokens, tokenization and token transfer are, we think we can split into two categories:

- **token container:** the essence of the token without regard to the underlying advertising tes;
- **token content:** the value, content, right or thing token through the token the blockchain is represented.

**Example of token container and token content.** This model works best with the analogy of a Cargo containers and complements the above description of a token Economy. The token cover corresponds to the container itself and the contents of a container corresponds to the real value, so that a loaded container in analogy to the here introduced token equivalent. The handling of a loaded container is based on rules and processes for the shell of the container and on the other hand rules and processes for the contained cargo together. For example, there are facts that arise from the fact that it is one Container transport, eg dimensions of the container, transport and loading processes. In the standard For example, the loading paper is also taken over by the respective carrier approved. In addition, there are "content-dependent" rules, such as those for the respective loaded Container valid Import regulations.

**Elements of efficient token regulation.** Following this thought model, the consistent



and with the current laws, regulations and processes the most compatible introduction of Tokens, and thus the foundation of a digital token economy, look and feel like this to assemble two essential elements:

- **General rules for all types of tokens:** Rules that are specific to the nature of the token  
Attaching containers so that rules, the provisions valid for tokens of all kinds, laws, regulations, regulation, inspection requirements, etc. apply. This concerns, for example, the generation of tokens (-enveloping), the tokenization of real values and their reversal process (digital representations are dissolved and the administration of the rights of a value is reintegrated into the non-digital talen world), the transfer of tokens between entities on the blockchain as well the administration and safekeeping of the tokens.
- **Existing laws and regulations :** capital market law and regulation (but also other re rights areas) should be based on tokens according to their nature, ie depending on the Token (container load) as far as possible and unchanged.  
be turned. However, adjustments should be made where necessary to:  
to enable the corresponding digitization of the value and the law in essence

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to transfer to the digital world. For example, the rules on custody, if the "container cargo" securities are, according to the depository law.

**First cornerstones for electronic securities.** In our view, this has recently been approved by the Federal Ministry of Finance and the Federal Ministry of Justice and Consumer Protection  
Cornerstone paper compatible with this model. There will be discussed how electronic securities (Bearer bonds) in accordance with existing laws and circulated can be. There are decided changes of the corresponding laws (eg "[...] currently mandatory documentary incorporation of securities should no longer be fully applicable [...]) discussed and also made suggestions on how essential aspects of today's regulation, eg Investor protection, to implement in the digital world, to the current valid specifications to fulfill. The just mentioned key issues paper also contains proposals for the implementation of the Consumer protection for digital debt securities. These implementation proposals are based on quently on the current consumer protection guidelines for the financial institutions mentioned in the paper. instruments.

**Tokens and consumer protection.** At least when offering tokens on blockchains without Access restriction, which is theoretically accessible to anyone token, and thus the sale of a kind Would correspond to an implementation in the sense of the token just  
To consider whether or which general consumer protection rules exist for tokens should. In combination with the specific rules and regulations for electronic debt securities would then have to guarantee the consumer protection sought in the above-mentioned make a difference. The already mentioned blockchain bill from Liechtenstein holds on p. 68 this as follows: "[...] token issuers are obliged to publish basic information about the tokens and to inform the potential buyers correctly about the tokens [...]. "

**Separation between tokens and underlying blockchain infrastructure:** As discussed in the introductory section  
As noted in the notes to this chapter, the value proposition of Blockchain in particular the legal security of the tokenization and its reversal by the token Rights and obligations, as well as all processes concerning tokens, are securitized. But they show up also the limits of the separation between tokens and the management system of the token. The token itself can not provide for its consistency. Should the blockchain keeping the token compromise

be mediated or even dissolve, the token is also affected. Likewise, a "double spending" of the token only by the surrounding system. These are completely different properties of the digital token against a physical certificate. In particular, the security of the token is of the configuration of the consensus algorithm of the respective blockchain system dependent. Metrics for Assessment of the dynamic safety are to our knowledge not yet existent (see also chapter Safety and reliability).

**Life cycle of a token** . For the legal certainty of the token economics it seems therefore necessary to make the token and the term "possession of a token" legally clear and accordingly to regulate the processes and information requirements relevant in the lifecycle of a token. A good Starting point can be found in the bill from Liechtenstein. Here we see the necessary the legal anchoring of the following points:

- "The token as a legal element for the embodiment of rights of all kinds" (quote from the legislative bill Liechtenstein);

<sup>6</sup> See "Key Issues for the Regulatory Treatment of Electronic Securities and Crypto-Tokens - Making Digital Innovations Possible - Ensuring Investor Protection " of 7 March 2019 (Federal Ministry of Finance, Federal Ministry of Justice and Consumer Protection).

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- the basic information required for each token;
- Proof of exclusive possession and transfer of ownership. For this purpose, in the usually based on private-public-key-based cryptographic infra-called structures.

We are currently seeing regulatory processes associated with the token lifecycle

- the **generation or tokenization** - technical generation of the token, the coupling to the respective basic information and the coupling to the rights embodied by the token;
- the **issue** - public issue and provision of tokens;
- the **transfer** - direct transfer between users of a blockchain (peer-to-peer transfer), possible direct transfer between users through possible dedicated service providers, operation markets for tokens of all kinds;
- the **custody** - processes and IT applications for safekeeping of tokens or the corresponding private key (usually outside the blockchain) and custody Services.

**Relevance of the right contained in a token.** The treatment of a specific token or a Tokengattung follows the container model following from the in the implementation phase creating laws and regulations and the right of the owner contained in the token. In doubt, the contained right will determine the treatment of the token.

**Token economy: tokens based solely on blockchain applications**

**Illustration of exclusively digital rights.** Following the use cases, in which tokens are used to authenticate rights in the "real" or physical world, we turn now to a possible treatment of tokens, which certify exclusively digitally available rights. Strictly speaking, it would also be necessary to distinguish between native tokens (ITC class TTS41 according to the international Token Classification, ITC<sup>7</sup>), eg Ether as the native token of the Ethereum Blockchain, and purely digital Tokens (ITC class TTS42), eg securitizations of rights that are defined only on the blockchain, For example, the shares in an investment fund that only invests in crypto assets will differ.

**Tokens with direct reference to the respective infrastructure.** Native tokens (ITC class TTS41) are part of it the respective blockchain infrastructure and enjoy in our opinion on the respective block chain a special position, since their generation and direct dissemination between users of the respective Blockchain is closely linked to the respective blockchain protocol. Basic information about these native tokens result from the respective system parameters or the protocol.

**Equivalence to tokens directly related to the real world.** For the tokens, the purely digital rights

<sup>7</sup> The International Token Classification (ITC) classification system was developed by the International Token Standardization Association (ITSA) based in Berlin, whose associated founding members, among others the Federal Association of German Banks (BdB) and the Federal Association Investment and Asset Management (BVI) are.

(ITC class TTS42), but are not native tokens in the just defined sense, we see In principle, the same requirements as described above in the section "Tokens in Use Cases of "Real world" described. These tokens are generated and then given to the blockchain users - possibly rule-based - made accessible. A transfer from user to user (ie, peer-to-peer peer), as in the tokens described above in real world use cases Basis of the protocol of the respective blockchain.

**Equal treatment of tokens.** We think that because of this fact everyone In principle, tokens should be treated equally. However, due to a sufficiently abstract regulation different technical needs to be met in the realization.

### **Tokens have a variety of appearances**

**Token as a heterogeneous construct.** The Federal Government leads in its questionnaire to Blockchain Among other things, the strategy states that no amount of crypto assets has been There is a risk to the stability of the financial market, but at the same time, for example, the money laundering must be adjusted. We would like to acknowledge and underline this. The money laundering Problem is urgent to solve, otherwise the level playing field to the established players will be violated, which must bear massive cost items. If crypto assets in line with local Laws can be developed from this, worldwide carrier platforms for tokens (eg Ethereum).

**Enormous variety of different token types.** The range of projects (mostly startups), the

Previously funded through tokens, as well as the range of other applications for Token ecosystems as bearer platforms of rights will increasingly differentiate. Far more \$ 19 billion was invested in ICOs in 2017 and the first half of 2018. melt. Slightly less than half have lost some or all of their value. there Typically, utility tokens have been issued to date, giving the buyer a right to future Provide services or claims to products. In the context of the great ICO wave 2017 and Fraudulent emissions also hit the headlines in 2018. We want the existing uncertainties the nature and design of tokens, in order to specific features of a special token type, the security token. this could also be considered in the context of e-money regulation. All areas, nominated by the Federal Government (Industry 4.0, IoT, Energy, Logistics and Mobility), Do not come without a reference to official currencies on DLT basis. That's why this topic is really important.

## Security Token

**Security Token as future "shell" for securities.** In the course of the description of the ecosystem

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There is a mention of the Token Economy and tokenization of valuables so-called "Security Token" in the questionnaire of the Federal Government again. Security Token Offerings (STOs) have emerged from the ICOs and form the basis for the representation of securities in the Future. We go based on the current application possibilities and characteristics of the Token types assume that in addition to "Pegged Payment Token" (ITC class EEP21P), for example in the form of Euro-on-Ledger especially security tokens (ITC class EEP23) will enter the market in the next five to ten Years to dominate. Therefore, this field should have a special weight in the legislative process receive. A key result of security tokens will be the significant reduction in setup Costs to place securities on the capital market.

**Notation of security tokens on bearer platforms.** Main differential between utility Tokens (ITC class EEP22) and security tokens is the fact that in the context of security tokens a legally recognized capital market construct is represented by a token. Crypto-assets like eg Ethereum or EOS can become an efficient platform for securities. On These are then "installed" by means of Smart Contracts Security Tokens, for example, which are legally compliant money laundering directives) - even if the under- The underlying carrier platform is a cryptocurrency such as Ethereum. The key benefits of DLTs come also fully in this field of application to the validity. Thus, security tokens may be arbitrary (also international) transferable, enable lower set-up costs, generate only low transaction costs cost, can be grds. arbitrarily program and improve the power over the tokens, than that they can be decoupled from a stock exchange to a digital terminal. About that In addition, the token transactions are unfeasible and to a high degree through the involvement of Automated Smart Contracts. Conversely, this shows a covert problem of incomplete Regulation. A regulated company like a bank could not issue tokens legally, because the blockchains can not be matched with the basic IT (BAIT) requirements. The Risks arising from IT implementation must be included in the specialist requirements of the regulator.

to create a level playing field here.

**Abstract instead of concrete regulation.** BaFin already expressed its opinion in February 2018 Information letter on the regulatory classification of ICOs relevant tokens or cryptos to währungen. In the further course of the analysis, we recommend considering the specific one However, characteristics of STOs, however, also indicate that for an efficient and no explicit classification of tokens is required. That through a right represented by a token is of crucial importance (eg various securities laws), when issuing specific basic token rules concerning "digital handling", ie ownership, possession, theft, etc. In this case, the token would be a container for others Rights can be with existing regulations. However, this must be the container itself but abstract and generally regulated. Since tokens can be used very flexibly the types of tokens are growing very rapidly, and areas that are still unknown to us today to reach. Against this background, a regulation based on specific token types is not expedient (as stated above), as it could be interpreted as inflexible and small parts and moreover the danger of a collision with other special regulations. Instead, the container model proposed in Liechtenstein should be analyzed in order to support the Connection of the "real" world to digital infrastructures generally and abstractly regulated.

**European Union as the target level for regulation.** National initiatives should under no circumstances replicate the regulatory fragmentation in Europe that characterizes the traditional financial system. With The EU Capital Markets Union has launched a comprehensive initiative. With this will that The objective is to enhance the European single market and, above all, the cross-border allocation of capital strengthen. Precisely because of the highly divergent national legal regimes and subsequent building

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country-bound market structures, the ambitious project was so far only manageable Success crowned. As far as crypto-assets are concerned, none have yet reached national borders established market structures that could disrupt capital allocation in the internal market.

**Priority for European initiatives.** Where national initiatives can not be avoided, they should aimed at creating a single European market. A new technology can also be an opportunity to initiate overdue regulatory reforms by national governments Special interests are blocked.

**Digital illustration of securities:** A realignment of securities regulations should be the fully exploit the specific advantages of digital technologies. Digital illustrations of securities allow in particular in connection with the blockchain technology real-time representations of Shareholder structure of companies. This offers unprecedented opportunities for transparency initia- In addition, such real-time transparency can make more efficient forms of corporate Enable governance and contribute to unfair manipulation and investor compensation avoid.

**Blockchain technology and basic data protection regulation**

**Open questions due to the irreversibility of blockchain transactions.** After the current

Specifications of the General Data Protection Regulation (DSGVO) and the national Federal Data Protection Act privacy laws and blockchain technology are at least in most cases incompatible. It is one of the basic features of the blockchain, on the one hand "immutable" and the other other "plain text" (iSv publicly visible possibly pseudonymous transaction data) to be. On the one hand The complete fulfillment of the data subject rights under the DSGVO is likely to be public chains not possible. Depending on whether the data are collected directly from the person concerned or not, must be informed of the information listed in Art. 13 or Art. 14 GDPR. That should be the responsible people are facing considerable practical challenges, if only for the Notification of the names and contact details of the person responsible (s). As a rule, a public Blockchain set up in a decentralized manner, so has no responsible.

**Difficulty in providing information about records.** In particular, the DSGVO admits the Data subjects in Art. 15 et seq. GDPR rights to information, correction, deletion, correction, restriction processing, data portability and, if applicable, objection. How these rights in the light of Immutability and permanent storage of the data stored in the blockchain to be preserved is so far unclear. It is within the usual blockchain applications simply not possible, for example, the data subject rights to deletion and correction become. Adjustments to the blockchain are possible, but then counteract the original concept because they require central (re) units in addition to the blockchain and / or other assumptions to the trustworthiness of the partners. Currently in discussion for this are approaches, instead of Transaction data only to store hash values of the transactions, or the keys (ie the relatedness of the data set) only as references to other keys, so that their Connection can be deleted or time slices (ie, data extracts for certain periods of time) from the blockchain are to form. All these ways change the characteristics of Blockchain strongly, but probably come only in very specific cases constructively to fruition. This is the case, for example if a position is sufficiently trusted to carry out deletions centrally or with limited distribution.

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but not enough is trusted to carry out the transactions centrally.

**Abandoning rights is not possible.** In fact, it is impossible for those concerned to be contractually bound to want to abdicate. This is not legally possible, because a waiver of the data protection law Affected rights is simply ineffective.

**Clarification of the operator question.** Further detailed analysis seems necessary in this regard to the To be able to map DSGVO requirements in blockchain systems. Next to that would be an adaptation the DSGVO so that they also systems without operators (or with unrecognizable Operator), as is the case with public blockchains. In the previous legislative This has not been the case in privacy matters so far.

### Smart Contracts and Contracts

**Smart contracts for the automation of legal obligations.** Another development stage within the token economy are so-called "Smart Contracts". Smart contracts are computer programs for the automated execution of contractual or legal obligations. These include besides contractual conditions, the automatic and contract-compliant transfer of tokens. This

allows for permanent control and offers great automation potential. The Federal Government This implies that with the use of Smart Contracts by reducing the cost and the Transaction time, an application optimization can be achieved in different areas, such as in the energy sector.

**The difference between smart contracts and contracts in the legal sense.** It is essential First, the distinction between smart contract and contract in the legal sense: A contract in the Legal sense is a legal obligation of the parties to their declarations of intent. at The interpretation of the content of the declarations of intent and thus of the contract will cover all the circumstances of the case Considered individually. The legal bond manifests itself in the state enforcement of the corresponding contract content. A smart contract is not a contract in the legal sense, but can be one At best, correctly reproduce the contract in the legal sense. Because a smart contract is inevitably on the corresponding computer code reduced. An overall assessment of all the circumstances of the individual case Exploring the "right" consequences is also taking into account all the currently realistic ones Artificial Intelligence (AI) solutions unthinkable.

**Trusted Smart Contracts in a technical process.** The biggest meaning comes Smart Contracts as part of the execution of the contract on: If-then Conditions can be automated and their processing guaranteed. Smart Contracts were therefore rightly already in the 1990s as digital versions of a vending machine Are defined. Analogous to a classic (functional and unmanipulated) vending machine addressed a smart contract the counterparty risk, in this case the solvency and willingness of the Buyer. Trust is replaced by a technical process. The result of this technical Process is not necessarily "legally correct". The federal government should have this Analyze subject area separately.

**Smart contracts as legal offers and offer assumptions.** Despite the focus on the Contract execution and the circumstance that between legal contract and smart contract too

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can differ on the use of smart contracts legal liabilities and also Contracts are established. The use of a smart contract can, depending on the design in the Individual case, constitute an offer; the deposit into a smart contract can justify an assumption the. A contract is not limited to a specific form and can in principle in each Language, also about a programming language such as Solidity done.

**Consumer protection in the first place.** From the use of programming languages to define Contractual liabilities, however, result in consequential problems: As part of the preparation of the Contracts can lose important information. In addition, after creation, the corresponding Smart Contracts are often harder to read than contract texts. Again, issuers and Service providers for the circulated Smart Contracts.

**Personal power and state monopoly on power.** In any case, it must be ensured that not smart contracts to consumers and other contracting parties that are typically are in a weaker bargaining position, such as tenants, travelers or patients, Consequences that would otherwise be clearly forbidden. In particular, the limits must the forbidden own power observed and the state monopoly of force remain untouched. in the Individual case becomes a demarcation of recognized prepaid models and disturbances of possession new Pose challenges.

**Collision of law enforcement and decentralized blockchain systems.** Likewise arises through

the decentralized transnational nature of the public blockchain systems poses a problem when a court orders that a contract text be interpreted differently than by the machine. Such This amendment is not intended and, in case of doubt, as in "The DAO", requires a fundamental change the underlying blockchain. To enforce this in all jurisdictions is likely due to The numerous interdependencies in DLT systems prove to be complicated. Issuers and Service providers are also liable for the errors of the technology used.

**Limiting the use of smart contracts through formalities.** The general possibility However, concluding contracts in any language and in any way does not mean that all contracts are so legal sense can be closed. Some businesses require a specific form. This applies, for example, to the transfer of land or shares of limited companies Liability, as well as the granting of certain powers. Partially must have valuables to be imperatively embodied. This applies, for example, to securities. In that regard, the law currently limits the Use of Smart Contracts. The initiative of the Federal Government for the regulatory treatment of electronic securities is an important first step in dismantling legal innovation hurdles and should give rise to an evaluation where the relevant formal requirements are neutral supervisory law should be replaced.

**Complexity of Smart Contracts.** The terms to which a payout or other consequence can be extended as desired. Through these extensions, the contracts can be highly be granular and bring about with a high degree of accuracy appropriate consequences. In none In this case, smart contracts can replace case law. A subsequent correction of the results must always be possible. This is only possible on public blockchain systems if Pro programmers of public blockchain systems or the authors of smart contracts had anticipated this and prepared the program code accordingly. Issuers and service providers should They are liable for their program code (eg Smart Contracts, custody solution) that they place on the market.

### **Safety and reliability of blockchain systems**

**Game theory-based stability of blockchain systems.** Can be used with private block chains the reliability requirements of the system (for example, at banks compliance) the BAIT) still the operator or the operators impose, so this is not with public blockchains the case. While integrity and reliability are the goal of the blockchain infrastructure, it will be there but rather game-theoretically motivated. This means that operational reliability is more dynamic Nature is and thus the stochastic result of given probabilities (eg this concerns the Finality of transactions). That's why Satoshi Nakamoto has Bitcoin as an "experiment" started. If the computing power in the open system is unfavorable, the blockchain is compromised. liveable (eg a 51% attack on Bitcoin Gold). If the case occurs, that no longer operator Interest in operating a particular public blockchain would be virtually non-existent. was standing Today, about 1000 blockchain systems are inactive after a sometimes very euphoric project start become.

**Collision of uncontrolled reliability with regulated economic sectors.** The reliability



A public blockchain is therefore subject to dynamic changes and uncontrollable. The should be contrary to most applications in regulated sectors (eg investor protection) to run. Again, much research is needed before the result of the experiment - the ability - is assessable in all aspects. The issuer and service provider is also responsible for the to draw.

**Requirements for IT security.** For a safe operation of a DLT it must be ensured that the private keys are stored securely in a (digital) location. These must on the one hand against Secured data loss and protected against misuse by encryption become. It should be considered in the clarification of the application architecture that for many DLTs, especially blockchains, currently there is no adequate security regarding quantum computers. Accordingly, there is a real danger that these technologies will be disrupted in a medium term window Any third parties become vulnerable and all data can be decrypted.

### **For general regulation of tokens**

**Cross-border processes.** Regulation of the use of DLT must be at an international level Level, since the rights represented by tokens are not necessarily related to a physical one Possessions are bound within the geographical borders. So could federations like the European Union (EU) is a relevant authority responsible for the classification and monitoring of Token is responsible. In an international network, these organizations should then become global Experts panel to represent the economic use and political regulation of tokens without geographic restrictions. The international consensus for the Regulation of DLT thus not only promotes innovation in this area, but can also constitute a valuable starting point for general political dialogue. For Germany and

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all other EU countries offer in our view the EU an optimal starting point for a to formulate efficient regulation. Regardless, each embodied in a token Rights are designed and implemented at the appropriate national level, as is already in the interplay between EU legislation and national legislation the case is. However, from this perspective, the Federal Government should focus on the area of cross-border consider pending token transfers.

**Tokens as a starting point for regulation.** In addition, the essential features should be in Regard to the legitimate possession of a token as well as the respective relationship between that on the State of the applicable law and the token in a legislation. On Another focus of the legal design should be the digital transfer of tokens. in this connection should also consider a transfer of tokens between possible blockchain / DLT systems become. Regulations and procedures with regard to unwanted, criminal activities should as well Consideration. A good starting point for this is, for example, already by the Federal Government cited application of anti-money laundering and anti-terror financing regulations in context of tokens. The legislation at the token level and not related to a specific blockchain / DLT proves to be advantageous in other countries, since all applications in one

comprehensively comprehensible legal legislation. therefore should the state then also service providers that interact with tokens (eg trade, generation, Custody) through appropriate licensing and registration and also requirements to the respective blockchain / DLT infrastructure to be used. Presumably then is a certification not required in differentiated areas.

### Other relevant aspects

**Central Europe is sometimes a leader in Blockchain.** A successful development of the DLT Scene can be for Europe, especially in the Baltic States, Germany, Austria, Switzerland and Liechtenstein, watch. In addition to the legal structure of possible regulations, we see especially a second, decisive factor for a successful future with DLT, the Training.

**Great importance for the training.** Sustainable and scalable DLT innovations require one solid education in information technology, digitization and programming. We recommend Therefore, a comprehensive promotion and strategy for the field of education regarding DLT in Special but also digitalization in general - limited to relevant occupational fields, but in all ages. Also connecting areas, which until today only a niche existence, are here important (eg interface between computer science and law, interface between computer science and engineering eurwesen).

**Importance of the private sector for the operation of DLT systems.** We hold it because of the However, high momentum in the market does not prove expedient for a state or the EU to be the sole one Operator of a DLT infrastructure positioned. The regulation of the service providers is enormously important because of the End the market over supply and demand will define sustainable concepts. A control is thus only indirectly through the legislation possible. It could also be beneficial to state Authorities operate compute nodes in DLT systems in order to enable, for example, real-time analyzes and Automate reporting to the state.

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**Differentiation of DLT systems to databases.** Blockchain systems aim, contrary to through the Federal government quoted expert opinion, in no way to a replacement of conventional Database systems. Instead, DLT systems ideally complement database systems. This In principle, the Federal Government should use the definition in its questionnaire and the Clarify the blockchain strategy based on this.

**Power consumption of public blockchain systems.** An essential feature and criticism of some crypto-assets are the enormous power consumption, the proof of work (PoW) - Consensus algorithm is caused. Although this can not be changed in the short term, it only affects crypto Assets and public-keychains issued with a PoW consensus algorithm tokens or implemen-applications, and by far not all approaches. The Federal Government should in the questionnaire clarify that DLT and Blockchain systems grds. also operated with low power consumption eg when consensus algorithms such as proof-of-stake (PoS) are used should or the relevant for Critical Infrastructure Proof-of-Authority (PoA).

**Possibility of direct state intervention in DLT protocols and smart contracts.** For the We also want to give concern to the desired regulation that the legal framework is not must be formulated in all aspects from an external perspective. So it is good conceivable that the state in the future its regulations (eg in the field of taxation) directly into the Logs implemented by blockchain systems. This should not be dogmatically excluded become. On the contrary, for level-playing reasons, this must be mandatory in the logs as the banks were also ordered to pay the capital tax (meanwhile even transnational via FATCA).

**Options as a relevant application for the blockchain.** State processes, such as elections (including Bundestag election, state election, municipal council election) and resolutions, can also tokenized. This applies in addition to public elections and votes in Companies (eg general meetings, corporate actions), associations or other types of consensual dung. Polls can hardly be manipulated by the use of technology, which Counterfeits of elections are virtually excluded. Through corresponding technical DLT Protocols, media, initiatives and other voters can make the decision-making process in all Understand details. In addition, the election result could be calculated correctly and ad-hoc - at simultaneous enormous reduction of administrative and organizational effort. Therefore, the should Federal Government examine this topic complex for their Blockchain strategy. For at the same time anonymous Elections that are nevertheless comprehensible to the electorate, but there are also independent of the block chain concepts already worth mentioning.

## Conclusions

**Technology-neutral regulation.** There should not be a "Lex Blockchain", as the cornerstone paper stated. The laws should regulate requirements technology neutral. The hindrance to technical advancements (also for blockchain) lie mostly in the fact that the techniques "paper, Signature and ID card" for the requirements for possession, declaration of intent and identification be set. Especially for the blockchain are the requirements for reliability of the system and to be able to seize the possibilities of intervention by the regulator in a technology neutral way.

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**Consideration of dynamics.** But this is also how young the blockchain technology is is and what rapid development this is currently subject. Meanwhile, there is no longer "the" Blockchain or "the one" blockchain technology. Under the collective term are quite different Operator models (public versus private) and very different concepts (proof of work Consensus Blockchains on "Blockchain inspired" tools like R3 Corda or similar up to newer distributed Ledger technologies, among others, based on "Directed Acyclic Graphs" subsumed. Because against the background development of a legally binding definition of "blockchain" should not be allowed always have neutrality towards all that can be used in an application context Technologies.

**New research projects and enough budget.** In our opinion, that would be extreme advantageous to start research projects in Germany or the EU, which among other things analyzes how

Blockchain can be designed according to regulations. This is not the focus of technical development. While banks spend more than half of their IT budget in regulatory investing adjustments has probably been little invested here in terms of blockchain. In the course of the project, it would also be possible to see where the technology meets regulatory requirements and where, conversely, the regulatory requirements for the new technology can be adjusted because the requirements are too specific here. Relevant specific questions For example, the quality parameters and security levels of blockchain systems or the Assessing the reliability of blockchain systems. Noteworthy here are the Studies on blockchain technology, the Federal Office for Information Security currently performs.

**Enormous potential with significant risk.** The entire technical ecosystem around DLT and Blockchain features high modularity and flexibility in terms of tokenization out. Therefore, it is difficult to estimate all possible effects based on today's knowledge. However, an efficient and future-oriented, necessarily international, legislation lead to a significant strengthening of innovation. The digital illustration of rights and Identities, combined with modular legislation, can provide many positive applications in the field of computing different areas of our economy. It should be noted that simply a digitization and computerization of the certificate takes place, because the digital systems have completely different characteristics: identical copies cause difficulties, just public Blockchains are decentralized, transnational infrastructures that do not benefit from judicial access. In doubt, coded contracts are interpreted differently by the machine than by humans intended, can hardly be corrected (despite any court order) and privacy is only reachable in a roundabout way, which make the original intention of the system questionable. Ten years are since the release of Bitcoin, the first application of blockchain technology. A Referral to the legislature is overdue in order to determine the potential. simultaneously The implementation requires tremendous care and correction, as the technology here very much fundamentally different from the existing system of national rule of law goes.

Berlin, March 27, 2019