Exploring the Current State of Research on Blockchain and Cryptocurrency – Analyzing Enablers, Inhibitors, and Indeterminate Factors

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Abstract. Blockchain might have the potential to transform business and society. Taking a retrospective look, this literature review shows (1) that a large share of contributions is still concerned with cryptocurrencies, the first application area of blockchain technology; (2) that research on blockchain has transgressed from information systems to other domains; and (3) the current state of research using the five types of theory of Gregor (2006). Analyzing past contributions, enablers (such as crypto-friendly policies) and inhibitors (such as low-quality data sources) for the development and adoption of blockchain systems are identified. Interestingly, the impact of some factors – such as transaction costs and privacy – is not clear yet, with prior research disagreeing whether these are enabling or inhibiting.

Keywords: Blockchain, Cryptocurrency, Literature Review

1 Introduction

Blockchain technology describes a distributed network of nodes that process transactions in a tamper-proof fashion and record them to an immutable storage. Because of these properties, a prime use case of blockchain has been decentralized payment networks in the form of cryptocurrencies. However, in articles such as "Beyond Bitcoin" [1, 2], "Beyond Cryptocurrencies" [3], and "Bitcoin and Beyond" [4], other use cases that leverage on benefits of a tamper-proof information system have been imagined, for example identification [5], healthcare [6], supply chain management [7–9], finance [10, 11], arts [12], and entertainment [13].

Considering the large potential impact of blockchain technology, our literature review aims to identify the current state of blockchain research, showing whether the technology has established itself both outside the limited use case of cryptocurrencies and outside the domain of information systems. Past research has mentioned that it will need both time and the right circumstances for blockchain to become a pervasive technology [14]. We furthermore want to shed light on these circumstances, identifying factors that foster and stifle the application of blockchain technology. Thus, we ask two research questions:

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RQ1: What is the current state of blockchain research?

RQ2: What enablers and inhibitors to blockchain development and adoption exist?

This article makes two major contributions. First, it analyzes the current state of blockchain research using descriptive metrics, such as (1) the number of articles published in IS and Non-IS journals, (2) the number of articles published on cryptocurrency in particular vs. on blockchain in general, and (3) the kind of articles published using the five types of theory developed by Gregor [15]. Second, this article analyzes prior work to find current enablers and inhibitors to the development and adoption of blockchain technology, proposing avenues for future research.

2 Conceptual Background

A blockchain describes a decentralized, immutable, tamper-proof, append-only database that stores and processes transactions between independent peer-to-peer nodes without a central instance. All transactions are validated and cryptographically signed, therefore protected from manipulation. These transactions are combined into so-called blocks via a Merkle tree structure by repeatedly pairing, hashing, and merging transactions until only one hash, the Merkle root, remains. By referencing the Merkle root of the previous block, individual blocks of the blockchain are cryptographically linked. Through the usage of consensus mechanisms, consistency between the individual network nodes is ensured through a common protocol that describes how blocks are formed and which node is eligible to write a new block to the blockchain [16–19].

Cryptocurrency is the most well-known application area of blockchain technology and thus featured extensively in current research (e.g., [20–22]). It describes a network of individual nodes that are tasked with running a system for the exchange of a digital currency. By incentivizing certain nodes, so-called miners, to serve as a notary for transactions, a cryptocurrency network realizes a financial system without a central intermediary. Miners are rewarded for their tasks through cryptocurrency payment. Honesty of these miners is ensured via a consensus protocol that allows other network nodes to check the miner's actions for correctness [2, 16, 23, 24].

3 Research Method

To assess the current state of blockchain research, we conduct a systematic literature review following the methodology of Webster and Watson [25]. To capture current high-quality scientific knowledge in the domain of Information Systems, we search the eight journals of the IS Senior Scholars' Basket of Journals [26]. To explore the wider implications of blockchain on business and society, we also include the 50 journals of the Financial Times 50 list in our search.

To acquire relevant articles from the resulting 55 journals (MISQ, ISR, and JMIS are on both lists), a full-text search on the websites of each journal is conducted, using the search terms "blockchain" and "distributed ledger". The term "distributed ledger" has been proposed in scientific literature to provide an overarching term for the underlying blockchain technology to avoid the confusing usage of "blockchain" for the technology, system instances, cryptocurrency networks, and other uses [5, 27].

However, the literature search shows that the term "distributed ledger" has not been able to surpass the term "blockchain" in academic literature. "Blockchain" is the more favored term with 356 results, while "distributed ledger" can only accrue 66 results. In sum, this led to 422 articles considered for review. After removing duplicate entries (due to significant overlap between the results of the two search terms) and results that could be discarded from the outset (such as "call for papers" and "about the authors" sections), 298 articles remain. Reading their abstracts and quickly scanning these articles, only those articles are kept that pay more than lip service to the topic of blockchain. As a hype topic, blockchain is often mentioned in conjunction with technological developments such as AI as a driver for change in single sentences at the beginning or end of an article, regardless of the article topic. After removing those articles, we arrive at a set of 119 articles. After detailed reading, additional 29 articles were removed. While these articles seemed promising on the basis of their abstract and the first view, detailed reading has revealed that they are only marginally touching upon the concepts of blockchain or cryptocurrency. They were thus excluded and our research remains with 90 articles that are considered for our literature review. The review process is shown in Figure 1.

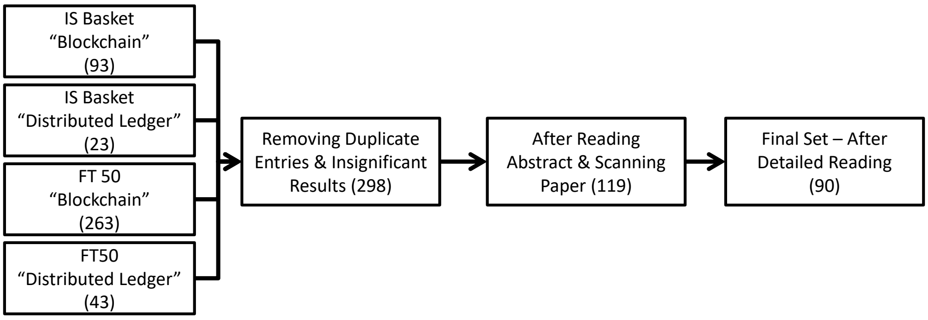

Figure 1. Literature Review Methodology

For every article, we record several descriptive features, including author, year, title of the paper, journal, and the affiliation of the first author. Considering article content, we record the scientific methods used (up to three), whether the article predominantly deals with blockchain (binary), the unit of analysis, the broad topic of the article, and the type of IS theory the article most closely fits to according to Gregor [15]. Contrary to other literature reviews [16, 28], we do not focus on certain aspects of the technology, such as the technical implementation or the impact on individuals and markets, but try to provide a holistic overview. Thus, articles on cryptocurrencies such as Bitcoin and Ethereum are included. We differentiate between articles on blockchain technology in general and articles on cryptocurrency in particular through an additional indicator. Furthermore, we record the research questions (if given) and the main findings of an article. To address RQ2 specifically, we analyze the articles for indicators of enablers or inhibitors for development and adoption of blockchain technology.

4 Results

4.1 Descriptive Statistics

To answer research question 1 and to determine the current state of research on blockchain and cryptocurrency, we analyzed the collected 90 articles for several descriptive variables. In the following sub-sections, we will assess the collected articles from different perspectives. First, we will describe the distribution of articles on both cryptocurrency in particular and blockchain in general, showing that a large share of research on blockchain has, in fact, not gone “beyond cryptocurrencies” [3]. Second, we will describe the distribution of blockchain research articles across IS- and Non-IS journals, showing that blockchain research has transgressed the domain of IS. Third, we use the five types of theory developed in Gregor [15] to show the current state of research.

Beyond Cryptocurrency? The first application area of blockchain technology has been cryptocurrencies. In contrast to traditional banking systems, cryptocurrency networks such as Bitcoin and Ethereum do not rely on a central authority [16]. As indicated by the introduction, blockchain has been said to have application areas that go above and beyond the implementation of decentralized payment systems [14]. To assess the current state of research regarding blockchain technology, we differentiate between articles that focus on cryptocurrencies in particular and articles that are concerned with blockchain technology in general. If both topics are touched upon, we chose the one mainly reflected in the article. We chose to make this distinction to better understand the current state of research in the domain of blockchain. While cryptocurrency represents the most common use case of blockchain technology, it is still only *one* use case. To go beyond this limited perspective, research ought to investigate the application of blockchain for other use cases and in general.

Of the 90 articles considered for this literature review, 36 were focused on cryptocurrencies, while 54 dealt with blockchain technology in general. This could indicate that interest in blockchain generally has surpassed the interest in cryptocurrency specifically. However, once we exclude the articles that only partially address blockchain topics, the picture becomes more equal: 29 articles cover cryptocurrency topics compared to 31 articles that address other blockchain topics.

We further investigated whether the occurrence of cryptocurrency and blockchain articles is linked to a certain time period. In doing so, we collected the year of publication for all articles mainly focused on these topics. Contrary to the assumption that blockchain will evolve beyond cryptocurrency, the number of articles on this topic has recently risen, as shown in Figure 2. This sudden rise could be explained through the long review cycles in the high-quality journals considered for this literature review. If this is the case, a significant number of publications on other blockchain topics may emerge in the following years. Another potential explanation may be grounded in the transparent and public nature [27, 29, 30] of cryptocurrency networks such as Bitcoin and Ethereum, which make it easy to study this content in contrast to inter-organizational blockchain development and other use cases.

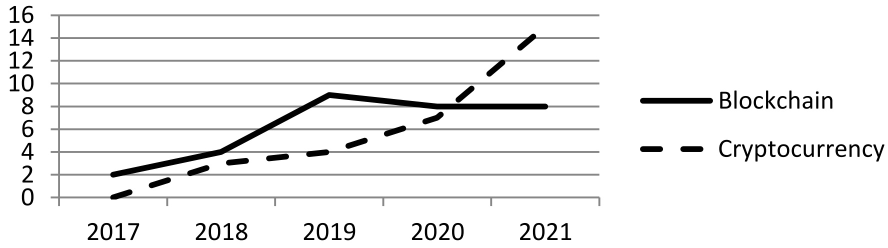

Figure 2. Number of Articles on Blockchain and Cryptocurrency per Year

Blockchain – A topic of IS? Blockchain technology has become an important research area for information systems research in the past years. Several researchers have pointed out that blockchain will be an important topic for the years to come [16–18]. However, due to the alleged growing importance of blockchain technology, other disciplines have started to pick up blockchain research. Of the 90 articles considered for this literature review, 26 articles come from IS journals (~30%) while 64 articles (~70%) come from Non-IS journals. If the set of articles is narrowed down further by only considering articles that mainly deal with blockchain and cryptocurrency topics, this ratio stays almost the same (17 IS vs. 43 Non-IS). If we further exclude articles on cryptocurrency, this ratio does not change (10 IS vs. 21 Non-IS). Thus, while research on blockchain as a multi-party information system may provide a good basis for IS research, blockchain research is not restricted to the field of IS. Other research disciplines, such as management [19, 31] and supply chain [9, 32, 33] research have already adopted the technology.

The Nature of Theory in Blockchain Research. Utilizing the taxonomy of Gregor [15], which describes five different types of theory for IS research, we classify the 90 articles used in this literature review. An overview can be seen in Table 1. We additionally differentiate between articles that put their main focus on blockchain technology or cryptocurrency and articles that only feature these topics in limited fashion (e.g., by devoting one or multiple chapters to it). As blockchain and cryptocurrency are hype topics, researchers tend to include them in articles on various topics. We wanted to include the additional findings of articles that deal with blockchain and cryptocurrency in a limited fashion while still being able to differentiate them from articles mainly concerned with blockchain or cryptocurrency. Therefore we differentiate between *articles mentioning* and *articles focusing* on blockchain and cryptocurrency. Henceforth, a short description of each theory type according to Gregor [15] is given before explaining its role in research on blockchain technology.

First, *theory for analyzing* represents the most basic form of theory. It is mainly used when phenomena are still new and developing and provides a contribution in the form of ordering and classification schemes [15]. With 12 articles, theory for analysis is still very common in research on blockchain (e.g. 17, 19, 34), signifying its status as a novel phenomenon requiring frameworks. For the topic of cryptocurrencies, this form of research is rather uncommon, featuring only a single contribution [35]. This might indicate two things: (1) research on blockchain in general is more complex than research on cryptocurrency; and (2) cryptocurrency research is more mature than research on blockchain in general.

Second, *theory for explaining* is concerned with the *how* and *why* of phenomena. Typically, such research will try to explain why certain things happen and what causes them. This type of theory strives for causality and broad propositions. Case studies are a typical research approach for this kind of theory [15]. Multiple contributions exist for both the topics of blockchain (e.g. 8, 36, 37) and cryptocurrencies (e.g. 27, 38–41).

Third, *theory for predicting* does not attempt to provide a causal explanation to a certain phenomenon in theory and only aims to achieve high predictive power. While this approach is common for contributions in the realm of cryptocurrencies, featuring mathematical models and statistical analyses of ICOs [42–46], transactions [47–49], prices [50–53], reward schemes [54] and bitcoin addresses [22, 48], it is not seen in general research on blockchain technology. This may be caused by the unique opportunity that cryptocurrency networks represent, featuring rich data on which predictions can be made, compared to the relative inaccessibility of data for other blockchain projects.

Fourth, *theory for explaining and predicting* aims to combine the achievements of the two aforementioned types of theory by providing testable and causally explainable propositions and hypotheses. Typical research methods of this type of theory include case studies, surveys, and experiments [15]. This type of research is found across both blockchain in general (e.g. 9, 32, 55) and cryptocurrency in particular (e.g. 20, 21, 56, 57), with a higher number of articles of the latter.

Fifth, *theory for design and action* aims to provide actionable guidelines that describe *how* something should be done. These guiding articles for how to successfully build and implement blockchain systems are not found in cryptocurrency research, but only in general blockchain research. However, there are only four contributions [7, 11, 33, 58], indicating a relative lack of prescriptive blockchain research. It seems that future-oriented blockchain research is mainly conducted by startup firms and industry research [59]. For example, several articles mention Tradelens, a joint venture by Maersk and IBM that aimed to provide a secure and automated blockchain-based platform for global supply chain management [60–62]. However, academia should aim to provide future-oriented design research to stay both practically relevant and to shape future development [63].

Table 1. Distribution of Articles across Gregor's (2006) Five Types of Theories

	Research focusing on BC and Crypto			**Research mentioning BC and Crypto**		
	Blockchain	Crypto	Total	Blockchain	Crypto	Total
Analyze	12	1	13	27	7	34
Explain	8	6	14	13	7	20
Predict	0	10	10	0	10	10
E & P	7	12	19	9	12	21
Design	4	0	4	5	0	5

4.2 Enablers & Inhibitors

To address research question 2, open coding was applied to the content of the 90 selected articles [64]. After a while, multiple common themes emerged, which will be explained in the following sub-sections. The analysis identified enablers, inhibitors, and *wildcards*. As indeterminate factors, the impact of *wildcards* is not clear yet. While some researchers contest that these features are enabling, others contest that they are inhibiting.

Enabler 1 – Crypto-friendly Policy Development & Regulation. A frequently mentioned issue in the development and deployment of blockchain technology is the lack of adequate policy and regulation for blockchain systems, resulting in confusion about whether and how a blockchain-based system for a certain use case can and should be realized. Public policy is an influential factor [65, 66] for both organizations to develop [67] as well as individuals to adopt blockchain technology [35, 68], and is necessary for blockchain to attain the status of an institutional technology [69]. The development of a "crypto-friendly public policy" [69] could thus reduce adoption barriers for blockchain technology and facilitate development. Such policy should entail rules and regulations for the usage of blockchain technology, the handling of private and personal data, and how to punish misconduct concerning blockchain technology [70]. A difficulty in laying down a solid policy is the lack of engagement of policy-makers [71] in early development phases, as they act under the assumption that they can join development at a later point. However, the immutable nature of blockchain technology makes such an ex-post involvement difficult [27]. Fostering early collaborations between entrepreneurs and policy-makers can improve this situation [71].

Future research in this direction could analyze additional success factors needed for successful policy development. Additionally, it would be interesting to see how blockchain policies across countries impact the adoption of the technology by organizations and individuals.

Enabler 2 – Incentives, Adoption and Network Effects. Simply put, for blockchain technology to be successful, it needs to be adopted and supported by its stakeholders

Personal beliefs shape usage intention -> so what factors drives usage intention -> my results

[72]. On the individual level, sentiments, as well as personal beliefs, seem to have a strong influence on blockchain adoption [37, 55]. Such beliefs shape the perceived benefit a potential user receives from blockchain technology [55]. Adoption of blockchain technology seems to be majorly influenced by incentives and benefits related to usage [10, 67, 72, 73]. On an organizational level, the capabilities of an organization, alignment of goals, stakeholder buy-in, and technological readiness are major success factors [8]. Corporate strategy and inter-organizational initiatives can help firms to adopt blockchain technology and to gain stakeholder support [74, 75]. Additional influences on the intention to adopt blockchain are high operating costs, information asymmetry, and dealing with perishable products that need to be tracked [11]. Furthermore, network effects have a significant influence [67, 76, 77] as certain business models depend on business partners on the blockchain [34].

Although some preliminary assessments of influencing factors on blockchain adoption exist, more research in this direction is warranted. Future research should identify context-specific success factors as well as strategies to successfully adopt blockchain for certain use cases. Additionally, future research could investigate whether network effects in the case blockchain differ from those affecting other technologies.

Inhibitor 1 – Low-Quality Data Sources. Depending on the use case, a blockchain may be used as a data management system aggregating data from a multitude of sources. To serve as a reliable single point of truth, data entered into and stored on the blockchain must be correct. While the inherent immutability of blockchain storage [78] and the tamper-proof data processing via smart contracts [79] can ensure that no manipulation can happen once data has entered the blockchain, data can still be manipulated beforehand. Previous systems acting as data sources may not feature the same level of manipulation-resistance [19, 79] and human actors entering data may have incentives to provide falsified data [74].

Problems in this area can occur in two different ways. First, once the incorrect data is written to a blockchain, it cannot be deleted due to the immutability of the blockchain [7, 29, 80–82]. Second, data written to the blockchain may describe a physical state or point to an outside data storage. In this case, blockchain cannot account for changes happening off-chain and is forever stuck at in old state [29].

There are multiple ways to address these two problems. First, outside data sources can be certified by third parties, lending credibility to the entire data pipeline. However, certification may be prohibitively expensive [7, 29, 58]. Second, data to be written to the blockchain can be triangulated from several sources, thus eliminating the danger of a single compromised data source [58]. However, this may not be possible in certain situations. Third, to alleviate the problem of outdated data, continuously updating the blockchain might be an option [7], but this might be a significant cost driver [29].

Future design-oriented research should address this topic by developing integrated systems that solve this “Garbage in, Garbage out” problem. Future case studies might show how these problems are mitigated by practitioners.

Inhibitor 2 – Scalability. An often-cited problem in conjunction with blockchain is its lack of scalability [47, 58, 68]. However, to meet the performance demands of enterprise-level applications [7, 34], blockchain systems must scale economically [10, 58], surpassing the five to twenty transactions of public, permissionless cryptocurrencies such as Bitcoin and Ethereum [67, 83].

First attempts addressing the problem of scalability include hybrid architectures where blockchain only plays a limited role, for example storing hash values of larger amounts of data, which are stored outside the blockchain system [18, 58, 84]. However, hybrid systems feature drawbacks when off-chain data might be updated (Inhibitor 1) and the tamper-proof on-chain computation via smart contracts is not available for off-chain data. Second, simpler consensus protocols have been proposed. As simpler consensus protocols decrease the tamper-proofness of blockchain systems, they should only be used in environments where participants are (at least partially) trusted [7].

Future research might be able to (1) design and develop more efficient system designs and protocols, (2) show how problems of scalability are mitigated in practice and which trade-offs between scalability and security exist, and (3) show how higher scalability impacts the adoption of blockchain technology.

Wildcard 1 – Transaction Costs. Analyzing the collected literature regarding their findings on the cost of blockchain systems leads to a fragmented picture, distinguishing between three types of costs: (1) setup and implementation costs; (2) operation costs; and (3) coordination and mitigation costs.

First, setup and implementation costs describe the costs to get a blockchain system up and running [29]. Some contributions contest that the decentralized nature of blockchain systems lends itself more to small and growing networks which can easily and cheaply be set up and extended [29], while others contest that blockchain systems require system participants to acquire the specialized hardware, increasing setup and implementation costs [34, 85]. Additionally, defining system rules in a shared system entails a high need for collaboration between the participants, increasing costs [61].

Second, regarding operation costs, some sources contest that a blockchain network can reduce the operation costs for regular transactions due to the open network nature [86], the potential competition between network actors [11, 17, 23, 34, 69], and the opportunity to perform operations not feasible on other infrastructures, such as micropayments [35, 87, 88]. Additionally, smart contracts might decrease costs by automatically executing predefined functions [29, 82, 88], as long as the conditions are observable by the blockchain system [19]. In contrast, other sources contest that the operation costs are higher than in centralized information systems due to the computational overhead [29, 47, 58, 89].

micro payments, smart contracts

Third, coordination and mitigation costs describe the costs in case *something goes wrong*. A classic example is the infamous DAO accident, where ingenious hackers found a way to abuse an Ethereum smart contract to steal millions of dollars [67]. In centralized systems, such an issue would be quickly resolved through administrative action. In the case at hand, the incident instead led to a split in the community of Ethereum and a hard fork of the blockchain [67]. However, this way to resolve conflicts is extraordinary and not possible for regular transactions. Due to the inherent immutability of blockchain, it is practically impossible to redact wrongful transactions [80]. To prevent such transactions ex-ante, powerful and error-free smart contracts are needed to perform functions such as dispute resolution and escrow [17]. To reduce ex-post mitigation costs, researchers are working on redactable and mutable blockchains [82].

To summarize, we can see that the topic of costs is a controversial one in the area of blockchain. For both (1) setup and implementation costs as well as (2) operation costs, researchers are disagreeing whether blockchain will lead to an increase or a decrease in costs. Future research should explore the boundary conditions for successful cost reduction. As blockchain is no panacea [19], knowing when to implement blockchain and when not will be an important finding. As for (3) coordination and mitigation costs, future research ought to find out how high the potential costs of incorrect transactions really are. Additionally, design-oriented research should explore the possibilities of redactable and mutable chains.

Wildcard 2 – Security & Privacy. For any information system dealing with sensitive data, sufficient measures to ensure data security and privacy are important. Looking at the set of literature for this review, academic research seems to split over the question of whether blockchain is a sensible basis to develop a system for which data security and privacy are relevant.

Regarding security, the tamper-proof nature of blockchain systems [17] provides an excellent basis for a secure information system. However, some questions are still unanswered. Relying on asymmetric cryptography, blockchain users could be impersonated if their private keys are copied [80, 81]. Flaws in software cannot be ruled out [14, 18, 35, 68, 80], while the inherent immutability makes it impossible to rectify mistakes [80].

Regarding privacy, Hastig and Sodhi [8] find that sufficient user privacy is a critical success factor for blockchain projects. Raddatz et al. [55] and Pun et al. [32] show that privacy concerns are a significant influence on blockchain usage, depending on the awareness regarding benefits of blockchain technology [55] and advocate for minimizing such concerns [32].

On the positive side, transparent blockchain systems can make data usage visible to all network participants, thus increasing the control of users over their data [90]. Privacy-preserving blockchain-based systems are described to share relevant data while adequately protecting private data [88]. Replacing manual interactions in the flow of financial information with blockchain-based smart contracts greatly reduces the number of people looking at potentially sensitive data, thus increasing trust [78, 82].

trust

On the negative side, the technological foundation of blockchain as a decentralized public ledger [30] does not lend itself well to privacy requirements. In its purest form, data on a blockchain network is publicly visible [27, 67], incurring massive privacy concerns [29]. While users on blockchain networks might only be identified via pseudonyms [33, 85], recent research has shown that clustering and identifying techniques provide good results on the bitcoin network [22, 48]. If transactions could

privacy

be linked to individuals, privacy concerns could hinder the widespread adoption of blockchain [17]. Mitigating such concerns, research has started to develop measures that protect private data on blockchain networks, for example through private blockchains and off-chain storage of data with only checksums stored on-chain [58].

To summarize, the inherent transparency of blockchain makes it difficult to use it in a privacy-preserving manner. While first steps in the direction of private blockchains as well as add-on technologies to preserve privacy have been conducted, future design-oriented research should investigate additional solutions. Furthermore, the impact of awareness of the privacy implications of blockchain usage should be studied.

Additional Findings

The analysis revealed additional enablers, inhibitors, and wildcards, mentioned in fewer articles. These are not extensively dealt with but summarized in Table 2.

Table 2. Additional Enablers, Inhibitors, and Wildcards

Type	Name	Corresponding Studies
Enabler	Use-case fit	[8, 11, 13, 74, 87, 91, 92]
	Capabilities	[8, 36, 37, 75, 82, 92–94]
	Need for Trust	[7, 33, 58, 68, 87, 95, 96]
	Collaboration	[8, 34, 36, 97]
	Explicitness of Transaction	[19, 29]
Inhibitor	Complexity & Lack of Understanding	[6, 36, 48, 82, 85, 98]
	Energy Consumption	[17, 18, 83, 99]
	Conflicting Interests	[58, 70, 74, 96]
Wildcard	Industry Standards & Interoperability	[34, 36, 58, 67, 69, 79, 83, 88]
	Forks	[17, 37, 61, 82, 99]
	Incumbent intermediaries	[17, 32, 92, 95, 99–101]
	System Governance	[8, 31, 61, 78, 85]

5 Discussion & Conclusion

This article set out to critically reflect on the notion of blockchain as a fundamentally changing technology beyond cryptocurrencies, as predicted by many articles over the past years [1–4]. In doing so, it makes two major contributions.

First, it contributes to the literature on blockchain by providing an overview of high-quality and high-influencing contributions in the past years. By assessing the number of contributions in IS and Non-IS journals, we show that blockchain has transgressed from an IS topic to a topic of overarching interest. We also show that high-quality research in the past years is still split almost equally across blockchain in general and cryptocurrency specifically. Especially among the more developed types of theory according to [15], cryptocurrency publications still outnumber general blockchain contributions. Furthermore, we show that despite recent calls for more design research in the domain blockchain [18], only a limited number of such articles has been published, indicating room for more research.

Second, by analyzing 90 articles, we aimed to identify potential enablers and inhibitors for the development and adoption of blockchain technology. Influential enablers found were crypto-friendly policies, incentives, and network effects. Influential inhibitors found were the difficulty to ensure high-quality uncompromised data sources and the difficulty scaling blockchain systems. The most interesting finding were so-called *wildcards*, which may be either enabling or inhibiting. The most interesting among them were transaction costs and the security and privacy in blockchain systems. For each phenomenon, avenues for research were suggested.

This contribution should be assessed in light of its limitations. First, by restricting ourselves to the IS Senior Scholars' Basket of Journals and the Financial Times 50 list, articles from other sources were excluded. While we believe that these high-quality articles adequately reflect the current state of the top research and allow for identifying gaps for future opportunities, including lower-tier journals and conferences might give a more comprehensive picture. We aim to include more sources in preparation of a future journal submission. Second, the coding of enablers and inhibitors might be influenced by the perspective of the authors. However, by making our research process transparent, we invite other researchers to use our work to draw their own conclusions.

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