MASTER'S THESIS

Unlocking the Potential of Blockchain: Investigating the Added Values for Stakeholders in a blockchain (based) system

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Het potentieel van Blockchain benutten: Onderzoek naar de toegevoegde waarden voor belanghebbenden in een blockchain-systeem

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Abstract

Blockchain technology has garnered significant attention and has been increasingly adopted in various sectors, extending beyond its association with cryptocurrencies. Regarding the specific added value that blockchain (based) systems provide to stakeholders, there is still a significant knowledge gap. By conducting a thorough semi-structured interview study, this research paper seeks to close this gap. Three supporting secondary research questions help the primary research question, which examines the added values of blockchain (based) systems for stakeholders. This study explores the concrete added values that blockchain (based) systems provide to stakeholders in real-world scenarios by using a qualitative research methodology.

This essay carefully investigates the varied added values of blockchain (based) systems beyond its theoretical potential through interviews with professionals from a variety of industries and meticulous analysis of the data acquired. The results shed light on the added values that blockchain (based) systems offer across various sectors.

The study's findings shed important light on the transformative potential of blockchain (based) systems by demonstrating how it improves business processes' openness, trust, and efficiency. The implementation of blockchain (based) solutions is also explored in terms of the possible cost savings, simpler operations, and increased data integrity that stakeholders may experience.

The empirical data from this study helps stakeholders have a more complex knowledge of the added values of a blockchain (based) systems for stakeholders. The knowledge gathered from this research can help businesses, policymakers, and decision-makers use blockchain (based) systems successfully while ensuring that decisions about its adoption and implementation are made in a responsible and knowledgeable manner. This study advances the practical understanding of how blockchain technology might favourably affect many businesses and stakeholders by addressing the specific added value of blockchain (based) systems, adding to the increasing body of knowledge in the subject.

Key terms

blockchain, added value, stakeholders, system, distributed ledger technology, blockchain system

Abstract

Blockchaintechnologie heeft veel aandacht gekregen en wordt steeds meer toegepast in verschillende sectoren, waarbij de associatie met cryptocurrencies verder gaat dan dat. Wat betreft de specifieke toegevoegde waarde die op blockchain gebaseerde systemen bieden aan belanghebbenden, is er nog steeds een aanzienlijke kenniskloof. Door een grondige semi-gestructureerde interviewstudie uit te voeren, probeert dit onderzoeksdocument deze leemte op te vullen. Drie ondersteunende secundaire onderzoeksvragen helpen de primaire onderzoeksvraag, die de toegevoegde waarden van blockchain-gebaseerde systemen voor stakeholders onderzoekt. Deze studie onderzoekt de concrete toegevoegde waarden die blockchain-gebaseerde systemen bieden aan stakeholders in real-world scenario's door gebruik te maken van een kwalitatieve onderzoeksmethodologie.

Deze paper onderzoekt zorgvuldig de verschillende toegevoegde waarden van blockchain(-gebaseerde) systemen buiten het theoretische potentieel door middel van interviews met professionals uit verschillende sectoren en een nauwgezette analyse van de verkregen gegevens. De resultaten werpen licht op de toegevoegde waarden die blockchain (gebaseerde) systemen bieden in verschillende sectoren.

De bevindingen van het onderzoek werpen een belangrijk licht op het transformatieve potentieel van blockchain (gebaseerde) systemen door aan te tonen hoe het de openheid, het vertrouwen en de efficiëntie van bedrijfsprocessen verbetert. De implementatie van blockchain-gebaseerde oplossingen wordt ook onderzocht in termen van mogelijke kostenbesparingen, eenvoudigere operaties en verhoogde gegevensintegriteit die belanghebbenden kunnen ervaren.

De empirische gegevens uit dit onderzoek helpen belanghebbenden om een complexere kennis te hebben van de toegevoegde waarden van een blockchain (gebaseerd) systeem voor belanghebbenden. De kennis uit dit onderzoek kan bedrijven, beleidsmakers en besluitvormers helpen om blockchain(-gebaseerde) systemen succesvol te gebruiken en er tegelijkertijd voor te zorgen dat beslissingen over de adoptie en implementatie ervan op een verantwoorde en deskundige manier worden genomen. Dit onderzoek bevordert het praktische begrip van hoe blockchaintechnologie een gunstige invloed kan hebben op veel bedrijven en belanghebbenden door de specifieke toegevoegde waarde van blockchain(gebaseerde) systemen aan de orde te stellen.

Sleutelermen

blockchain, toegevoegde waarde, belanghebbenden, systeem, gedistribueerde technologie, blockchain systeem

Summary

Over the past decade, blockchain technology has emerged as a ground breaking innovation. Its potential uses have grown across numerous industries, piquing the interest of businesses hoping to use it to improve their industries. Despite this enthusiasm, there is still a sizable information gap that prevents stakeholders from knowing the exact added values that blockchain systems can provide. This study piece tries to close the gap by completing a thorough analysis by focusing on the stakeholders in blockchain (based) systems, the underlying principles of the technology, and the added values that result from its use.

To lay the foundation, the article begins by outlining the essential ideas of blockchain technology, emphasizing its decentralized structure, immutability, transparency, and audibility. These characteristics set blockchain (based) systems apart from conventional centralized databases and lay the groundwork for investigating the increased value they offer to system users. The essay also explores stakeholder theory and analysis, offering a framework for comprehending the people, groups, or organizations affected by blockchain (based) systems.

Finding the added values that stakeholders receive from blockchain (based) systems is the main goal of the research. This goal is accomplished by developing three sub-research questions: what is a blockchain (based) system, who are the stakeholders of blockchain (based) systems, what are added values for stakeholders. To address these questions, a robust methodology is employed, involving an extensive analysis of peer-reviewed journal articles. The focus of the search, which took place between January 2020 and January 2023, focuses on relevant papers written in Dutch and English, accessible through the Open University Library. Specific search terms related to blockchain (based) systems, stakeholders, and added values are employed to ensure a comprehensive and diverse range of literature.

The findings from the literature search inform an empirical study that centres around stakeholders and added values. During the deployment of this empirical study, an intriguing finding surfaces regarding stakeholder categorization within a blockchain (based) system. These categories are meticulously considered and verified through the empirical study. The study's insights provide valuable understanding of the added value that blockchain systems bring to stakeholders.

Increased efficiency emerges as an added value, as blockchain (based) systems streamline processes, eliminate intermediaries, and facilitate faster transactions. Transparency represents another crucial added value, with blockchain (based) systems offering a verifiable and tamper-proof record of transactions and data. This increases confidence among stakeholders, especially in industries where transparency is crucial, such supply chain management and healthcare. Additionally, increased security is noteworthy because blockchain's cryptographic methods guarantee data integrity and protect against fraud or unauthorized changes. The immutability of blockchain records adds to the confidence by giving stakeholders access to a reliable and auditable source of data. Reduced reliance on middlemen, automated procedures, and the termination of superfluous tasks all contribute to cost reductions.

As a result, a deeper understanding of the added value that blockchain (based) systems provide stakeholders is greatly aided by this thorough research. This research offers light on the potential influence of blockchain technology across several industries by delving into the fundamental concepts, stakeholder dynamics, and practical advantages. Stakeholders, legislators, and decision-makers can use the knowledge from this analysis as a helpful resource to help them decide whether or not to adopt and use blockchain (based) systems.

Samenvatting

In het afgelopen decennium heeft blockchaintechnologie zich ontpopt als een baanbrekende innovatie. De potentiële toepassingen ervan zijn gegroeid in tal van sectoren, waardoor de interesse van bedrijven is gewekt die hopen dat ze deze technologie kunnen gebruiken om hun sector te verbeteren. Ondanks dit enthousiasme is er nog steeds een aanzienlijke informatiekloof waardoor belanghebbenden niet precies weten welke toegevoegde waarden blockchain-systemen kunnen bieden. Dit onderzoeksartikel probeert de kloof te dichten door een grondige analyse uit te voeren door zich te richten op de belanghebbenden bij blockchain (gebaseerde) systemen, de onderliggende principes van de technologie en de toegevoegde waarden die voortvloeien uit het gebruik ervan.

Om de basis te leggen, begint het artikel met het schetsen van de essentiële ideeën van blockchaintechnologie, waarbij de nadruk wordt gelegd op de gedecentraliseerde structuur, onveranderlijkheid, transparantie en controleerbaarheid. Deze kenmerken onderscheiden(op blockchain (gebaseerde) systemen van conventionele gecentraliseerde databases en leggen de basis voor het onderzoeken van de toegenomen waarde die ze bieden aan systeemgebruikers. Het essay verkent ook de theorie en analyse van belanghebbenden, en biedt een kader voor het begrijpen van de mensen, groepen of organisaties die beïnvloed worden door blockchain (gebaseerde) systemen.

Het vinden van de toegevoegde waarden die stakeholders ontvangen van blockchain (based) systemen is het hoofddoel van het onderzoek. Dit doel wordt bereikt door drie deelonderzoeksvragen te ontwikkelen: wat is een blockchain (gebaseerd) systeem, wie zijn de belanghebbenden van blockchain (gebaseerde) systemen, wat zijn de toegevoegde waarden voor belanghebbenden. Om deze vragen te beantwoorden is een robuuste methodologie gebruikt, waarbij peer-reviewed tijdschriftartikelen uitgebreid zijn geanalyseerd. De focus van de zoekactie, die plaatsvond tussen januari 2020 en januari 2023, richt zich op relevante artikelen geschreven in het Nederlands en Engels, toegankelijk via de Open Universiteit Bibliotheek. Specifieke zoektermen met betrekking tot blockchain (gebaseerde) systemen, belanghebbenden en toegevoegde waarden zijn gebruikt om een uitgebreid en divers aanbod van literatuur te garanderen.

De bevindingen uit het literatuuronderzoek vormen de basis voor een empirisch onderzoek waarin stakeholders en toegevoegde waarden centraal staan. Tijdens het uitvoeren van deze empirische studie komt een intrigerende bevinding naar voren met betrekking tot het categoriseren van belanghebbenden binnen een op blockchain gebaseerd systeem. Deze categorieën worden nauwkeurig overwogen en geverifieerd door middel van de empirische studie. De inzichten van de studie bieden een waardevol inzicht in de toegevoegde waarde die blockchain-systemen opleveren voor belanghebbenden.

Verhoogde efficiëntie komt naar voren als een toegevoegde waarde, aangezien blockchain (gebaseerde) systemen processen stroomlijnen, tussenpersonen elimineren en snellere transacties mogelijk maken. Transparantie is een andere cruciale toegevoegde waarde, omdat blockchain (gebaseerde) systemen een verifieerbare en fraudebestendige registratie van transacties en gegevens bieden. Dit vergroot het vertrouwen onder belanghebbenden, vooral in sectoren waar transparantie cruciaal is, zoals supply chain management en gezondheidszorg. Daarnaast is de verhoogde veiligheid opmerkelijk omdat de cryptografische methoden van blockchain de integriteit van gegevens garanderen en beschermen tegen fraude of ongeoorloofde wijzigingen. De onveranderlijkheid van blockchainrecords draagt bij aan het vertrouwen door belanghebbenden toegang te geven tot een betrouwbare en controleerbare gegevensbron. Verminderde

afhankelijkheid van tussenpersonen, geautomatiseerde procedures en het beëindigen van overbodige taken dragen allemaal bij aan kostenbesparingen.

Een dieper begrip van de toegevoegde waarde die blockchain (gebaseerde) systemen bieden aan belanghebbenden wordt dan ook enorm geholpen door dit grondige onderzoek. Dit onderzoek biedt licht op de potentiële invloed van blockchaintechnologie in verschillende industrieën door zich te verdiepen in de fundamentele concepten, de dynamiek van belanghebbenden en praktische voordelen. Stakeholders, wetgevers en besluitvormers kunnen de kennis uit deze analyse gebruiken als een nuttige bron om hen te helpen bij het al dan niet adopteren en gebruiken van blockchain (gebaseerde) systemen.

Contents

1. Introduction

1.1. Background

The blockchain technology has emerged as a new technology (Di Pierro, 2017) and it initially gained popularity through cryptocurrencies (Gorkhali et al., 2020). It has now expanded its applications to various industries (Konstantinidis et al., 2018), and research has shown that this technique can be used in various systems (Andrian & Kurniawan, 2018). With increasing financial value and the ability to improve business processes, blockchain systems have become valuable (Guggenberger et al., 2021). However, the question remains whether stakeholders should be interested in blockchain (based) systems or whether it is just a marketing hype involving a risky investment. The main objective of this article is to investigate the added value of blockchain (based) systems for stakeholders. The first section of this study explores this topic, and the remaining sections are organized as follows: Chapter 2 presents the theoretical framework, Chapter 3 describes the study's design, Chapter 4 reports the findings, and Chapter 5 concludes the study.

1.2. Exploration of the topic

As previously stated, the objective of this article is to showcase the added value of blockchain (based) systems for stakeholders. Thus, the study will delve into three key concepts: blockchain (based) systems, stakeholders, and added values.

Blockchain is a revolutionary technology that has the potential to revolutionize industries (Van Rossum, 2017). It operates as a decentralized and distributed ledger technology (DLT) (Chandrasekar et al., 2021), providing a platform for developing decentralized applications without the need for a central authority (Antal et al., 2021). Nakamoto's foundational principles of blockchain technology, proposed the idea of using encryption and an open distributed ledger to create a digital currency application Nakamoto (2008). Blockchain functions as a chain of data blocks, each containing consistent datasets and a set of transactions (Nofer et al., 2017). Its advantages lie in decentralization, distributed ledger, tamper-proof construction, transparency, and openness (Xu et al., 2019). The concept of blockchain can be applied to any industry requiring decentralization and trustworthy decision-making among multiple stakeholders (Belotti et al., 2019). It finds applications in supply chains, energy, markets, and intellectual property management (Xu et al., 2019).

According to Wang and Benbasat (2018), effective stakeholder engagement and management are crucial for the successful implementation of new technologies. This is done by understanding the dynamics and interactions among stakeholders is vital in ensuring the technology's adoption, acceptance, and long-term success. The paper emphasizes the significance of stakeholder analysis, communication, and involvement throughout the implementation process. Stakeholder theory, which advocates creating value for all parties involved, was a pivotal development in this field (Freeman, 2010). Stakeholder analysis helps in comprehending stakeholders' actions, objectives, relationships, agendas, interests, and the resources or power they possess in the decision-making process (Brugha & Varvasovszky, 2000).

According to Schreieck et al. (2018), added value refers to the benefits and enhancements that technology brings to organizations, customers, and stakeholders beyond their initial expectations. Schreieck et al. (2018), indicate dimensions of added value in technology include increased productivity, improved customer experiences, enhanced product/service quality, cost reduction, and competitive advantage. Chen and Cheng (2019) also identified several dimensions of added value

resulting from technology adoption, including operational efficiency, customer satisfaction, competitive advantage, and organizational performance. Chen and Cheng (2019) further identify dimensions such as operational efficiency, customer satisfaction, competitive advantage, and organizational performance. Chen and Cheng (2019) state factors influencing the realization of added values include organizational readiness, employee engagement, and customer acceptance. Chernatony et al. (2000) support this by highlighting that added value is a complex concept with various interpretations and perceptions.

1.3. Problem statement

Previous studies have indicated that research on blockchain has predominantly focused on technical aspects of design and features, while neglecting its applications, value creation, and governance, leading to a lack of understanding of the effective use of the technology (Risius & Spohrer, 2017). Although there have been extensive studies on the potential utility of blockchain (based) systems in various application sectors (Ferdous et al., 2021), blockchain (based) systems are still poorly understood (Tseng et al., 2020). Blockchain (based) system provides enough benefits across industries so far, the implementation rate is very low due to the lack of knowledge about the benefits of blockchain system as well as lack of understanding about how and why it is needed (Aich et al., 2019). Duan et al. (2020) state that stakeholder cooperation is one of the primarily challenges for implementing a blockchain (based) system.

Implementing and persuading stakeholders to adopt blockchain (based) systems in business context is challenging due to a lack of understanding and recognition of the added value they bring. This makes it difficult to assess their cost-effectiveness. Despite research, there are still gaps and uncertainties surrounding the interplay between stakeholders, added values, and blockchain systems. Formulating a compelling business case for a comprehensive blockchain system that effectively manages and engages stakeholders is problematic. Addressing these challenges can help effectively manage stakeholders within the business case for a blockchain system, facilitating the persuasion process by showcasing their respective added values.

1.4. Research objective and questions

This research aims to examine the relationship between added values, stakeholders, and blockchain (based) systems. Specifically, it seeks to answer the question:

"What are the added values for involved stakeholders of blockchain (based) systems?"

This overarching question comprises three key elements: blockchain (based) systems, stakeholders and added values. To streamline the research and delve deeper into each aspect, three sub-research questions have been formulated:

"What is a blockchain (based) system?"

Understanding the concept and functionality of a blockchain (based) system is crucial for research. This sub-question helps researchers establish a common understanding of the technology, its key components, and operations. Accurately assessing added values and implications for stakeholders is challenging without a clear understanding of the underlying principles and technical aspects. Identifying distinguishing factors that transform the system from a traditional traceability system to a blockchain (based) system is essential.

"Who are the stakeholders of blockchain (based) systems?"

Identifying and analysing stakeholders in blockchain (based) systems is crucial for understanding the diverse range of individuals, organizations, and entities impacted by the technology. This sub-question helps researchers identify key actors, their roles, interests, and concerns, enabling a comprehensive assessment of their needs, expectations, and potential benefits.

"What are added values for stakeholders?"

Examining the added value of blockchain (based) systems is crucial for justifying their adoption and engagement. Researchers can assess potential enhancements, efficiencies, and opportunities in various contexts. Understanding these added values helps identify advantages such as increased transparency, improved security, enhanced efficiency, or reduced costs. These insights are essential for constructing a persuasive business case that highlights the tangible benefits stakeholders can expect from implementing blockchain-based systems.

1.5. Motivation/relevance

Blockchain research is developing rapidly in different fields (Upadhyay et al., 2021) and is just about to reach the peak of the Gartner Hype Cycle for Emerging Technologies (Notheisen et al., 2017). The growing interest in blockchain (based) systems across various industries, makes it crucial to fully understand the added values for stakeholders. However, there is currently a significant knowledge gap in this area, necessitating comprehensive research to address this deficiency.

By identifying and examining the added values for stakeholders, this research aims to improve decision-making processes and foster the development and investment in blockchain (based) systems. Understanding the added values that stakeholders can gain from these systems is crucial for effectively addressing concerns and challenges related to their adoption in organizations and industries.

The research tackles fundamental questions and explores the intricate relationships between stakeholders, added values, and blockchain (based) systems. It contributes to the existing body of knowledge by providing a deeper understanding of the added values stakeholders can derive from adopting and engaging with blockchain technology. The findings inform academic debates, discussions, and theories surrounding the implementation and management of blockchain (based) systems. Additionally, the research helps establish theoretical frameworks and models that researchers and scholars can utilize to study similar technology-driven phenomena. It sets the stage for further focused and rigorous investigations, potentially leading to advancements in the field of blockchain technology.

Moreover, the research carries social relevance considering the transformative potential of blockchain technology in public policy, service provision, and regulatory practices. Blockchain (based) systems have the capacity to revolutionize activities such as public administrative processes, welfare provision, and regulatory practices. Acquiring the necessary knowledge to successfully implement and manage such systems becomes essential from both social and practical perspectives. This research aligns with the broader societal goal of leveraging technology to improve public services, increase transparency, and enhance regulatory frameworks.

1.6. Main lines of approach

The study will now discuss the main lines of approach for the research:

1. *Introduction*: This section will provide a background of the key concepts, including blockchain (based) systems, stakeholders, and added values. It will state the research objective and questions, along with a problem statement and justification for the study.
2. *Theoretical framework*: A literature search will be conducted to identify relevant research on blockchain (based) systems, stakeholders, and added values. The literature review should identify gaps in the literature that the study aims to fill.
3. *Research methodology*: The study will develop a research design and methodology that will enable the collection and analysis of data to answer the research questions that were left unanswered in the literature search. The section will also describe the analysis of semi-structured interviews, including thematic analysis to identify key categories.
4. *Results*: This section will present the research findings and discuss their implications for understanding the added values of blockchain (based) systems for stakeholders. The findings will be compared with the existing literature, providing insights into the current state of knowledge in the field.
5. *Discussion, conclusions, and recommendations*: The main findings of the study will be summarized and discussed in detail. Recommendations will be provided on how blockchain (based) systems can be optimized to provide added value for stakeholders. The section will address the limitations of the study and suggest potential areas for future research.

Overall, the research approach will combine literature research and empirical study to identify and understand the added values of blockchain (based) systems for stakeholders.

2. Theoretical framework

2.1. Research approach

In the previous chapter it was stated that for our research it was crucial to explain three elements, a blockchain (based) system, stakeholders and added values. To execute the theoretical study, these elements will be addressed in the form of a question.

"What is a blockchain (based) system?"
"Who are the stakeholders of blockchain (based) systems?"
"What are added values for stakeholders?"

The study is specifically interested in peer-reviewed journal articles written in both Dutch and English published between January 2020 and January 2023, which are accessible online through the Open University Library.

Selection of Peer-Reviewed Journal Articles: Peer-reviewed journal articles are the primary source of information due to their rigorous review process by experts, ensuring reliability, credibility, and high-quality research findings.

Focus on Dutch and English Articles: The research team utilizes articles in Dutch and English due to their proficiency, enabling access to a wider range of literature and extracting valuable insights from both Dutch and international academic sources.

Utilization of Open University Library: The Open University Library is a reliable source for online articles, maintained by academic institutions, offering convenient access to various journals. Its convenience and reliability make it an ideal choice for scholarly literature on research topics.

Timing Motivation: The research is motivated by the observation made by Tseng et al. (2020) that blockchain (based) systems require further investigation. Therefore, the research aims to evaluate new information published between January 2020 and January 2023 for blockchain-based systems, stakeholders, and added values. This consistent timeline ensures recent developments, enhances relevance and currency, and avoids unnecessary complexity, focusing on the importance of blockchain systems in the field.

Snowball citation searching techniques may be employed in the literature search process to ensure comprehensive exploration and identify additional relevant sources. Grey literature may also be considered as supplementary sources, capturing a broader range of perspectives and findings related to blockchain systems, stakeholders, and added values.

2.2. Implementation

This section summarizes the literature search process, while appendix 1 provides a detailed account of steps, search terms, and criteria. The section follows chart logic.

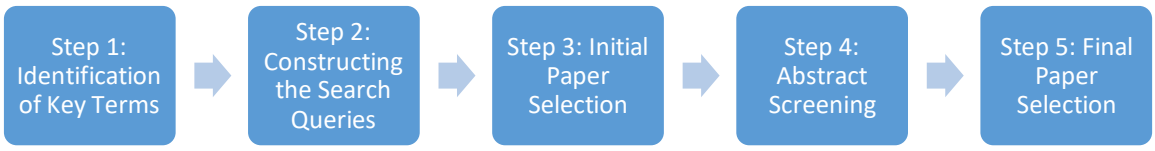

Figure 1: Literature search flow

Step 1: identification of key terms

To ensure a focused and targeted approach in retrieving relevant literature, specific key terms were chosen based on the exploration of the research topic in chapter 1. The chosen key terms and their rationale for selection are explained below:

For *blockchain (based) systems* the following terms were found in chapter 1: "Blockchain (based) systems," "Blockchain systems," "Open distributed ledger," and "Distributed ledger technology (DLT)". These terms encompass the fundamental concept of blockchain technology. Additional phrases were incorporated to refine the search and target more specific and relevant articles.

For *stakeholders,* the following terms were found in chapter 1: "Stakeholders," "Stakeholder approach," "Stakeholder theory," "Key players decision-making process," and "Stakeholder analysis". These terms focus on the stakeholders involved in blockchain (based) systems and cover theoretical and practical aspects of stakeholder management, decision-making, and analysis.

For *added values* the following terms were found in chapter 1: "Added values" and "Value creation". These terms are critical in understanding the benefits and advantages that stakeholders derive from blockchain (based) systems, encompassing economic, social, and strategic values

Step 2: Constructing the Search Queries

Diverse combinations of search queries were constructed to capture relevant literature based on the identified key terms.

Step 3: Executing the Literature Search

The refined search queries were executed in the Open University Library, incorporating language and timing criteria, to retrieve relevant papers published between January 2020 and January 2023. The search results were obtained from the Open University Library, which provides convenient access to peer-reviewed journals.

Table 1: Overview search queries

Category	Search query	Results	After filter on discipline computer science and business
Blockchain (based) systems	TitleCombined:(Blockchain (based) system)), AND (Abstract:(Blockchain (based) system)), AND (literature review).	18 papers	11 papers
Stakeholders	TitleCombined:(stakeholders)), AND (Abstract:(Stakeholders)), AND (Blockchain).	12 papers	8 papers
Added values	TitleCombined:(added values)), AND (Abstract:(added values)), AND (stakeholder), AND (systems)	10 papers	N/A

Everything equal or less than 11 was accepted as enough. Meaning that for blockchain (based) systems and stakeholders there was an additional filter used, which was the filter on discipline computer science and business. This results in 11 papers for Blockchain (based) systems and for stakeholders 8 papers.

Step 4: Abstract Screening

The selected papers underwent a screening process to assess their relevance to the research questions. Inclusion criteria included papers directly related to blockchain systems, stakeholders, or added values, providing insights, analysis, or empirical evidence on the topic. Exclusion criteria included papers lacking sufficient information on the proposed questions and not closely aligned with the key elements of the research.

Step 5: Final Paper Selection

After applying the inclusion and exclusion criteria, a final selection of papers was made. From the initial retrieval of papers, the following number of papers were retained:

- For "Blockchain (based) systems" search query: 8 papers.
- For "Stakeholders" search query: 3 papers.
- For "Added values" search query: 5 papers.

One supplementary paper was found for blockchain (based) systems and three for stakeholders. The table below displays the number of papers found after each stage of the literature search.

Table 2: Final paper selection

	Blockchain (based) systems	Stakeholders	Added values
Initially retrieved papers	11	8	10
Papers after abstract screening	8	3	5
Grey literature or snowball effect papers	1	3	0
Final number of papers used	9	6	5

2.3. Results and conclusions

This section reviews the results of the literature search on blockchain (based) systems, stakeholders, and added values, providing a comprehensive overview of current research, and addressing research questions formulated in the introduction of the chapter.

What are the key features of a blockchain (based) systems?

Ahmed et al. (2022) conducted a comprehensive survey on blockchain (based) identity management systems and self-sovereign identity ecosystems, which highlighted properties such as transparency, immutability, credibility, tamper resistance, traceability, decentralization, interoperability, portability, and secure timestamping. Alamri et al. (2022) emphasized the distinctive features of blockchain (based) system, including decentralization, anonymity, Self-Sovereign Identity (SSI), immutability, transparency, and audibility. Liang et al. (2020) presented an intrusion detection system for IoT that leverages blockchain and multi-agent systems, which underscored the

importance of transparency, trust, and tamper-proofing offered by blockchain technology. (Shuaib et al., 2022) emphasizes on the following aspect of a blockchain system: immutability, security, integrity, authenticity, and traceability. Akbar et al. (2022) proposed a maturity model for implementing blockchain in healthcare systems, highlighting the importance of data integrity, interoperability, and patient privacy as critical success criteria. Akbar et al. (2022) identified key features such as transparency, immutability, and decentralized consensus for a blockchain (based) system. Dwivedi et al. (2022) proposed a blockchain (based) electronic medical records system with smart contracts and consensus algorithms deployed in a cloud environment, emphasizing the potential of blockchain in enhancing security, privacy, and efficiency. Their research highlighted the key features of data immutability, accessibility, interoperability, and automated execution of contracts in blockchain (based) systems. Jolfaei et al. (2021) and Haddad et al. (2022) conducted surveys on blockchain (based) IoMT systems and scalability challenges. Their findings highlighted the importance of data security, trustworthiness, interoperability, and efficient transaction processing in blockchain systems. Haddad et al. (2022) conducted a systematic review exploring the integration of artificial intelligence (AI) and blockchain in healthcare records management systems. Haddad et al. (2022) research identified key features such as data privacy, integrity, security, accessibility, interoperability, and AI-enabled analytics in blockchain systems. The study highlighted how blockchain integration facilitates secure and automated data analysis, creating and managing content blocks called ledgers. Tesselhof et al. (2020) states that a blockchain (based) system is a decentralised network where transactions can be executed.

Based on the insights gathered from the reviewed articles, it becomes evident that blockchain (based) systems possess key features that differentiate them from traditional technologies, such as transparency, immutability, credibility, tamper resistance, traceability, decentralization, interoperability, portability, and secure timestamping. These properties establish trust in blockchain (based) systems by ensuring the integrity and authenticity of data, enabling secure and auditable transactions, and granting individuals greater control over their digital identities. Transparency and immutability are central features of blockchain (based) systems, providing a high level of credibility and tamper resistance. Decentralization and interoperability enable blockchain systems to operate without a central authority, distributing control among network participants. Self-sovereign identity (SSI) empowers individuals to have complete authority over their digital identities, while traceability and secure timestamping features enable the transparent tracking of transactions, facilitating auditability and accountability. Therefore, this provides an answer to our proposed question. A definition of a blockchain (based) system might be suggested based on the revelations from the reviewed publications. Using transparent, immutable, and tamper-resistant data structures, a blockchain (based) system is a decentralized network that enables safe and traceable transactions. Immutability, security, integrity, authenticity, traceability, decentralization, anonymity, transparency, and audibility are among the qualities it combines.

Who are the stakeholders of a blockchain (based) system?

Stakeholders, as defined by Cheng and Chong (2022), refer to groups of people or organizations crucial to a project's success and have a say in its outcome. Yadlapalli et al. (2022) note that stakeholders possess sufficient expertise in adopting blockchain technology. Tsilionis and Wautelet (2022) highlight that the group of stakeholders is much larger than shareholders, and Tesselhof and Veuger (2019) identify various entities as stakeholders. The literature presents different stakeholder information depending on the study's context. For example, Yadlapalli et al. (2022) mention clients, developers, and consultants who have experience in using blockchain technology, while Tsilionis and Wautelet (2022)mention C-level executives, IT system users, and suppliers, among others. Cheng

and Chong (2022) state that stakeholders tend to use blockchain technology when they believe it would improve their projects or offer potential benefits. However, Palas and Bunduchi (2020) note that stakeholders have different perceptions of value in adopting new technology, making it essential to use a stakeholder (based) approach when assessing its value. Palas and Bunduchi (2020) applied the four-component approach developed Ojala (2016) to determine the value created for user organizations and other key stakeholders (i.e., value capture and creation components) and how this value is generated.

The importance of stakeholders and their varying expertise in adopting new technologies, such as blockchain, are discussed in the articles. Stakeholders can include individuals, groups, or organizations, and their roles in a project's success or failure are significant. Unlike shareholders, stakeholders are a more extensive group that may include C-level executives, managers, users, staff, clients, and suppliers. Stakeholders tend to adopt blockchain technology when they perceive potential benefits, but their perceptions of value may differ. Thus, a stakeholder (based) approach is necessary when assessing the value of a new technology. Ojala (2016) four-component approach can assist in designing the value created for user organizations and other stakeholders. It is crucial to remember that the papers we studied did not include a detailed list of the stakeholders in blockchain (based) systems. It is difficult to create a thorough stakeholder-based approach tailored to blockchain implementations because of this knowledge gap. To identify and classify the stakeholders relevant to blockchain systems, more investigation is required. It is essential to comprehend the numerous stakeholders and their unique responsibilities, needs, and expectations to successfully embrace and execute blockchain (based) systems.

What are added values for stakeholders?

In the study conducted by Maltby et al. (2021) four main areas of 'added values' of adopting an ecosystem services approach were identified, including a unified approach to environmental policy and decision-making, identification of relevant risk assessment and prioritization, transparent and comparative assessment, and monetization. On the other hand, Tsilionis and Wautelet (2022) classified value into three categories: strategic value, stakeholder value, and user value. Strategic value: any technical development, adoption, and deployment that improves the organization's long-term position or its goods and service. Stakeholder value: any technology (based) aid that improves a stakeholder's quality of life in a certain business environment. User value: elements that are both functional and non-functional yet nonetheless help the user do their activities more successfully on a personal or professional level. Tsilionis and Wautelet (2022) also acknowledged that new sources of value may emerge during implementation, especially for stakeholders and users. Secor et al. (2022) argued that existing capabilities and features that are not essential to current systems can still contribute value, while Lin and Benneker (2022) suggested that a system can bring added values by enhancing transparency, user-friendliness, usefulness, and efficiency, as well as aiding in planning activities and promoting stakeholder participation. The article by Aguirre et al. (2021) discusses the application of value-added Pythagorean fuzzy failure mode and effect analysis (VA-PFFMEA) for risk assessment in different stakeholders. This paper provides insights into how the VA-PFFMEA approach can contribute to assessing risks and potentially uncovering added values for stakeholders in each context.

The articles provide information about the different categories of value and the benefits of adopting an ecosystem services approach, but it does not specifically address what added values are for stakeholders of a blockchain (based) system. The information provided can be used to draw some conclusions about the potential added values for stakeholders, such as improvements in their quality

of life (stakeholder value) and participation in planning activities (transparency and stakeholder participation), but it does not explicitly state what the added values are for stakeholders.

2.4. Objective follow-up research

Blockchain (based) systems are decentralized digital databases that utilize cryptography, consensus processes, and features like immutability, security, and transparency. They enable decentralized transaction execution on a distributed ledger and automate data analysis for content block management. Which means that the first research question is answered and does not need further research.

However, no articles explicitly state the specific stakeholders involved in a blockchain (based) systems. Stakeholders can be internal or external, and their support or opposition can significantly influence the project's success or failure. The articles do not specify the added values shareholders may experience, as they focus on all stakeholders rather than differentiating between them. Further research is needed to understand the various added values for different stakeholders.

3. Methodology

In the previous chapter, the study explored three research questions, but only one was answered satisfactorily while the remaining two require additional empirical research. Consequently, the study formulated an empirical research question: *"Who are the stakeholders involved in a business case for blockchain (based) systems, and what are their respective added values?"* This led to the creation of two empirical sub-questions:

"Who are the different types of stakeholders that are involved in a business case for blockchain (based) systems?"

"What added value have different types of stakeholders that are involved in a business case for blockchain (based) systems?"

3.1. Conceptual design: select the research method(s)

Saunders et al. (2019) identified quantitative research as experimental and survey-based, while qualitative research focuses on action, archival, case study, ethnography, and grounded theory. Appendix 2 provides a detailed discussion of these research strategies.

This study's research strategy is a survey, as case study and grounded theory research are too lengthy and insufficient for archival or documentary data. Ethnography and narrative research are not suitable for interviews with experts, making the survey the most effective approach.

One of the qualitative analytical methods that can be used for data analysis are thematic analysis, template analysis, explanation building and testing, grounded theory method, narrative analysis, discourse analysis, content analysis, and data display and analysis, as described in Saunders et al. (2019) and presented in appendix 3.

Thematic analysis is a primary method that focuses on identifying patterns or themes that emerge during data collection (Saunders et al., 2019). As the research questions in this study are centred around themes, thematic analysis will be utilized as the primary method of analysis. It is also important to note that the process of thematic analysis is iterative and may require multiple rounds of coding and analysis to fully capture the data's meaning.

3.2. Technical design: elaboration of the method

This section presents the technical design for conducting the empirical study, including the research strategy, candidate qualifications, candidate journey, and acknowledgment of special circumstances.

For this study, semi-structured interviews emerge as the most suitable methodology. While exploratory research can employ various methodologies such as in-depth interviews, surveys, or observations (Saunders et al., 2019), questionnaires may be time-consuming and limit participants' willingness to provide sufficient detail. In contrast, semi-structured interviews allow for a more flexible and interactive approach, enabling participants to reflect on events without the need for extensive written responses (Saunders et al., 2019). Since the participants in this study need to be experts who can respond to the questions, interviewing them is the optimal choice.

Semi-structured interviews rely on the valuable contributions of participants, making them highly suitable for exploring themes related to stakeholders and added values in this research (Saunders et al., 2019). Therefore, the next phase of the study will utilize semi-structured interviews as the primary method for data collection.

In the survey component of the study, the use of open, closed, and semi-structured questions is considered. However, closed-ended questions may not provide sufficient information, and open-ended questions may lack guidance. Consequently, the survey will incorporate carefully crafted semi-structured questions that address the themes related to stakeholders and added values. These questions have been developed by the research team, with each member contributing relevant questions based on their individual research focus and the specific information they aim to gather.

The team used a structured approach to develop interview questions, starting with broad inquiries and gradually narrowing down to specific details. They included potential answer options and follow-up inquiries for deeper exploration. Appendices 3 and 4 offer insights into the thought process and intention behind each question, enhancing the study's comprehensive understanding of stakeholders and their perceived added values.

The candidate journey will be explained via the following flowchart:

Step 1: Recruitment phase

To be eligible for the study, experts must possess the following characteristics: expertise in blockchain systems, willingness to participate, availability, communication skills, clarity, detail-oriented, open-mindedness, reliability, trustworthiness, and patience. Interviewees must be detail-oriented, detail-oriented, open-minded, reliable, trustworthy, and patient. The study team will recruit experts through LinkedIn and their own list of contacts. The goal is to provide accurate and honest information while maintaining confidentiality.

Step 2: Confirmation and Reminder Phase

Experts will be contacted via email and asked to participate in the study in Dutch or English (appendices 6 and 7). They will receive confirmation emails (appendices 8 and 9), a reminder 24 hours before the interview (appendices 10 and 11), and a thank-you email after the interview. Interview questions will not be shared with participants (appendices 12 and 13).

Step 3: Try-out phase

To ensure the effectiveness of the method and obtain the desired results, the study team will conduct a try out phase, where the team will interview with one candidate using the approach. After this try out phase adjustment to the protocol can be made.

Step 4: Interview Phase

The study involves four members conducting 16 interviews individually, in duo, or as a team. Interviewees can withdraw at any time. Interviews will be conducted face-to-face or via Microsoft Teams, with transcriptions automatically transcribed for data analysis. Filler words may be removed if they make understanding difficult. Triangulation, a method combining different data sources, will enhance the study's validity.

If internal documents are available, they will be requested, but confidentiality is required. An NDA will be needed, which can be provided through the university.

Step 5: Participant Withdrawal

During an interview, special circumstances may arise, such as preventing participation, interviewee no-shows, technical difficulties, excessive talking, providing irrelevant information, unwillingness to share documents, sensitive or emotional topics, brief or vague answers, and interviewee nervousness. The interviewer can send a new invitation, remind the interviewee of their availability, offer rescheduling or alternative communication channels, and address any technical difficulties. To maintain focus and avoid causing hazard, the interviewer can politely interrupt, redirect the conversation back to the main topic, and offer a short break or reschedule if necessary. The interviewer should also be empathetic and respectful of the interviewee's feelings and allow them to express themselves. To elicit more detailed answers, the interviewer can ask follow-up questions or probe further on the topic. To ease the interviewee's nervousness, the interviewer can start with general questions and gradually move to more specific questions.

After the interview: Open card sorting

The research team will create individual cards for each identified keyword or piece of information from interview transcriptions, visually arranging and grouped based on their relevance. This approach allows for a structured analysis of the identified keywords and stakeholder categories. Interview transcriptions will be documented in an Excel spreadsheet, with a dedicated column capturing words and phrases associated with added values and their corresponding context. This methodology will be applied to extract and categorize information related to stakeholders, with separate sheets dedicated to added values and stakeholders. The categorization process will be rigorously reviewed by all researchers to maintain the validity and consistency of the research findings. This meticulous categorization process will ensure a comprehensive and reliable analysis of the collected data, providing valuable insights into the identified keywords and stakeholder categories.

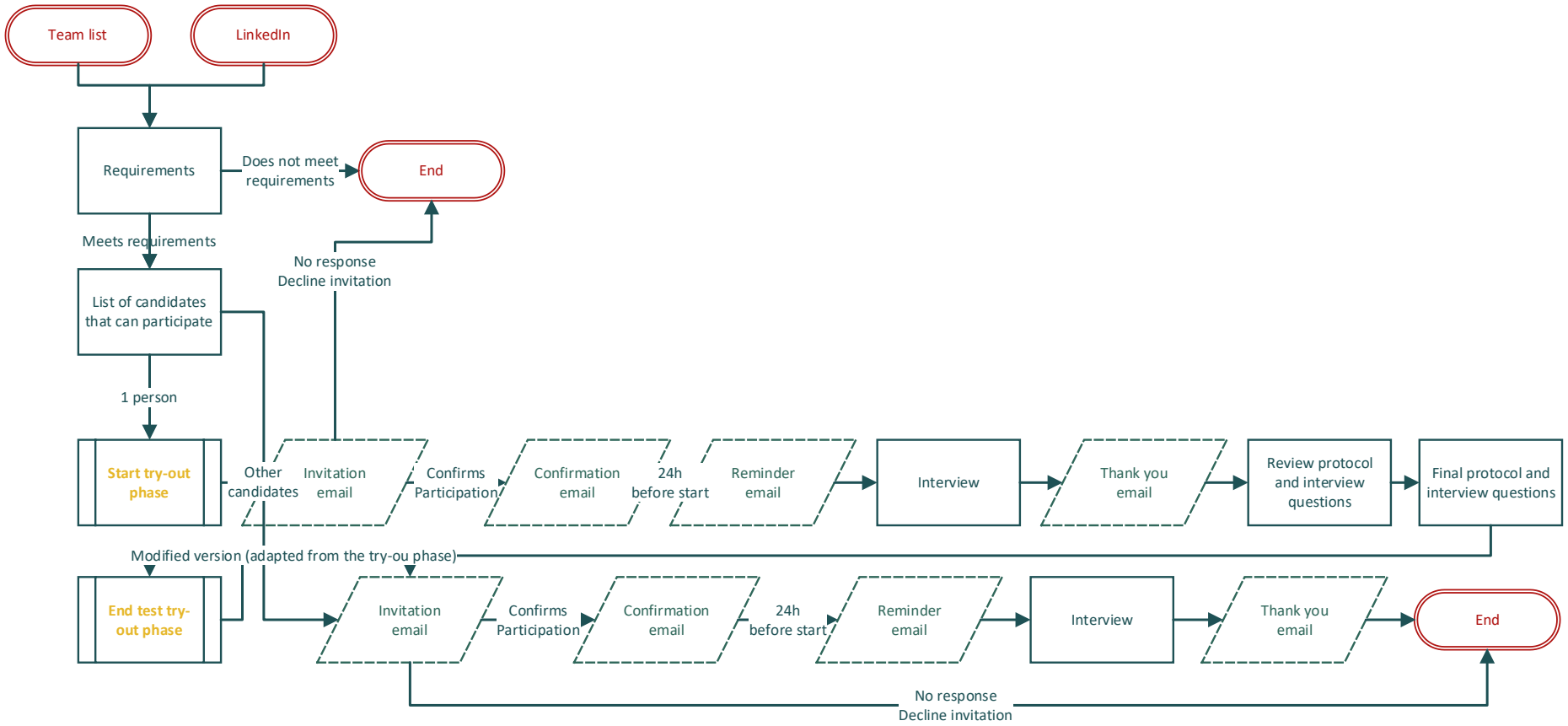

Figure 2: flowchart research design

3.3. Data analysis

The study team discussed the open card system for categorizing added values during a meeting with four researchers and a university facilitator. They decided to create individual cards for each keyword associated with added values, derived from literature searches. The cards would be written on separate cards, allowing for a structured and visual representation of the data. The team used Miro, a digital collaboration platform, to organize and visualize the cards. However, due to limitations in the free trial version, the number of cards was restricted, resulting in some merging (appendix 14).

The research team discovered a comprehensive list of stakeholders in grey literature, which will be incorporated into future analysis. These categories are found in appendix 15. The open card system uses these categories.

The researchers will categorize and organize data on added values and stakeholder categories using cards based on their relevance to interviews. They will review the data and assign appropriate cards to specific statements or responses. Each category will have a clear definition, ensuring clarity and alignment in the research. After analysing all interviews individually, the research team will merge the categorized data into one sheet for added values and one sheet for stakeholders, constructing the results and drawing conclusions.

3.4. Reflection w.r.t. validity, reliability, and ethical aspects

To ensure **internal validity**, the research team followed a systematic and transparent approach in both the literature search and interview preparation. They defined clear criteria for study selection, used appropriate keywords and databases, and documented the search process. They engaged in reflexive practices to address their own biases and assumptions, improving the internal validity of the interview process. Additionally, they used a standardized interview protocol, asking all participants the same set of questions, which further enhanced internal validity by reducing variability in data collection.

The research team used a comprehensive approach to establish **construct validity**, including conducting a thorough literature search to identify relevant constructs related to the research questions. This provided a foundation for designing interview questions and ensuring that the constructs of interest were grounded in existing knowledge. Expert input was used in the try-out phase to validate the interview questions and align them with established theories or frameworks.

To enhance **external validity**, the research team included a wide range of sources from different contexts, considering studies conducted in various settings and populations. They also selected a diverse range of participants with experience in blockchain (based) systems to increase the potential transferability of the findings. The research team prioritized studies that focused on real-world settings and actual experiences of stakeholders with blockchain (based) systems, emphasizing ecological validity.

Ethical standards were adhered to in the literature search, including proper citation and referencing, avoiding plagiarism, and providing transparent reporting of the literature review process. They acknowledged the authors' contributions and intellectual property rights, promoting ethical practices in academic research. In the preparation of interviews, informed consent was obtained from participants, ensuring they were fully aware of the research purpose, procedures, and potential risks and benefits. Confidentiality and anonymity were maintained, and any identifying information was handled with utmost care.

By incorporating these aspects of validity, reliability, and ethical considerations into research, the research team ensured robust and ethically sound research practices. The full reflection can be found in appendix 16.

4. Results

This chapter will discuss the results of the interviews.

Stakeholders

In appendices 19 and 20, the data of the interviews of stakeholders can be found. The study team used categories to classify the stakeholders because, as was discussed in the previous chapter, a list of stakeholders had already been discovered. The outcomes for stakeholders are listed below.

Interviews revealed potential malicious players in the **attacker** stakeholder category, including Facebook and Instagram, who pose dangers and raise concerns about their actions. Participants expressed concerns about their potential involvement in crimes and weaknesses.

Interviews revealed various **business stakeholders**, including chain owners, autonomous organizations, asset management departments, critical infrastructure managers, Tax Office, policy departments, decision-makers, Chamber of Commerce Board, directors, stock exchange, builders, CTO, management, and security departments. These stakeholders have a stake in the success of issues and commercial operations.

The interviews revealed a diverse range of stakeholders from various social perspectives under the category of **society**, including ecosystem members, nations, population, market, men, travellers, public transportation users, senior citizens, social networks, media platforms, and the system. These stakeholders impact the broader societal context and are interested in the topics under discussion.

Interviews revealed various **external experts**, including the Dutch Blockchain Coalition, third-party developers, engineers, maintenance parties, auditors, and legal specialists. These experts contribute their expertise, perceptions, and specialized abilities to the discussions, providing valuable input to the ecosystem.

The interviews revealed a diverse **user** base and ecosystem of individuals and organizations interacting with the system under discussion. These stakeholders include owners, actors, administrative staff, advertisers, lawyers, pension providers, companies, salvage companies, farmers, citizens, and more. Each stakeholder brings unique perspectives, needs, and contributions to the system, representing the diverse user base and ecosystem.

Interviews revealed various stakeholders, including **customers**, graduate students, and other businesses/clients. Their requirements, preferences, and feedback are crucial for the creation, enhancement, and success of systems. These stakeholders directly stake in the goods, services, or experiences offered by the systems under discussion.

The interviews revealed various stakeholders involved in **network management**, including ABN AMRO, businesses, chains, and other parties. These stakeholders actively participate in network management and contribute to its governance, value production, and operations. Their cooperation and coordination are crucial for efficient, effective, and sustainable network operations.

Interviews revealed diverse stakeholders in **regulatory** monitoring and governance, including regulators, governmental organizations, nation-states, municipalities, and stateless network states. The Netherlands Institute and other agencies may provide direction, analysis, or recommendations on blockchain technology.

Blockchain technology eliminates intermediaries, such as banks, tax offices, and legal counsel, from the financial industry. This **redundancy** of **intermediaries** can improve efficiency, efficiency, and

streamlined processes, making the ecosystem more efficient, economical, and streamlined. The decentralized and transparent nature of blockchain technology eliminates the need for intermediaries, enhancing trust and security across various industries.

The interviews mentioned many stakeholders involved in providing technological infrastructure and solutions under the stakeholder category for **technology providers**. Suppliers of construction materials, central servers, databases, and suppliers of general technology are some of these stakeholders.

The categories highlighted above derived from the existing literature and are also validated through our research with the assistance of expert interviews. The findings from both sources consistently support the presence of these categories, reinforcing their significance in the context of our study. By drawing on both the literature and expert insights, we have established a solid foundation for understanding and exploring the identified categories of added values for stakeholders.

Table 1: stakeholder categories

Category Stakeholders	Definition	Stakes (in the business case)
1 external expert	An external person and/or organization who is consulted for their expertise to provide input for the business case for BBS (DLT)	The use of expertise as input and not be misused what can result in reputation damage. For the short term there will be financial benefits.
2 technology providers	Persons and/or organizations who provide hardware and software technology across the life cycle of BBS (DLT)	Technology providers earn money (revenue), accomplish good partnership (internal) and protect their reputation (external).
3 redundant intermediate	Persons and/or organizations (intermediaries) who currently functions as intermediate in the process and who are negative stakeholders and therefore have to be considered in the business case (become superfluous because their (commercial) activity is undermined by BBS)	Expected redundant intermediaries like to maintain their position within the current chain.
4 (malicious) attacker	Persons and/or organizations intending to compromise BBS (DLT)	The malicious attacker earns money, is working on reputation, and/or terrorism.
5 business stakeholders	Persons and/or organizations who are interested in profitability of the BBS and looking forward to integrate their added values in the business case of BBS (DLT)	The business stakeholder supports to set up and develop on strategic and tactical level the business case for BBS.
6 users	Persons and/or organizations who will add data and can control data at BBS (DLT)	Users who want to exchange data on a operational level user-friendly and manageable.
7 customers	Persons and/or organizations who are receiving products or services that	Customers prefer ease of use and a user-friendly and manageable BBS.

	are created or delivered in a reliable way by using BBS (DLT)	
8 network management	Persons and/or organizations managing the system, that monitor the network and work together with other organizations in a chain where data are exchanged via BBS (DLT)	That the individual organization influences the construction, monitoring and maintenance of the network of BBS (DLT).
9 the society	The society who represent the interests of individuals and organizations operating in a certain industry using BBS (DLT)	The society wants a transparent process and a user-friendly BBS related to ethical, integrity and privacy issues (DLT).
10 regulators	Authorities responsible for making policy, writing standards and setting regulations along with enforcing them for BBS (DLT)	Regulators want respect of the rules related to BBS (DLT).

In appendix 21, the full results of the stakeholders can be found.

Added values

In appendices 22 and 23, the data of the interviews of added values can be found.

The interviews highlighted the added value of **innovation** in various fields, such as job creation, modernizing corporate practices, and embracing novel business models. Participants expressed a desire to use digital currencies and tokens, and highlighted the importance of credit scoring, data sales, and digitization. They also discussed the potential for new business models and revenue streams through cryptocurrency, tokens, and creative applications. They highlighted the disruptive potential of not keeping up with innovation and the importance of being inventive to maintain a competitive edge. Participants also expressed a desire to profit from their content through creative methods, being original, and responding quickly to consumer feedback. The interviews highlighted the potential for changing sectors, making money from content, and exploring new investment opportunities.

Participants discussed the added value of **process improvements and efficiency**, including fewer visits, clearer goals, and reduced administrative burdens. They also highlighted the benefits of information organization and storage, automation, and better performance. They emphasized satisfaction with the program and potential for increased earnings through creative methods. Digital information storage and interchange were also emphasized, with increased productivity, communication, and collaboration. Cost reduction, cost splitting, and cost-benefit analysis were also discussed. Blockchain technology offers speed, simplicity, and efficiency, with potential for improved channels, collaboration, and increased return on investment. Interview participants emphasized the importance of **auditable and validation** features in blockchain (based) systems. They emphasized the need for a clear audit trail, tracking transactions, and ensuring data verifiability. blockchain (based) digital signatures were also introduced to verify transactions and reduce fraud. Results were deemed beneficial for engagement, product quality, and data verifiability. Self-identification and quantifiable performance indicators were also discussed. Process controls, registration, and stimuli were also discussed. Auditable and validation processes contribute to assurance, accountability, and trustworthiness in various scenarios.

Data governance procedures play a crucial role in creating and preserving an image or reputation, consolidating information, and promoting environmental awareness. Collaborative processes and

interaction are essential, and blockchain technologies can help achieve this. Data governance also helps adapt to the new data environment and creates a broad meta value. Participants emphasize the importance of sovereignty and good data governance procedures for sustainability, integrity, and trust in the digital age.

In the interviews, participants discussed **transparency and trustworthiness**, emphasizing the importance of access to information, establishing confidence, and rapid data verification. They also highlighted the importance of participation evidence, transparency, and open-source techniques. They also highlighted the significance of unfalsifiable data, open data, and open-source techniques in fostering transparency and trust. They also highlighted the importance of clear transaction administration, party trust, chain transparency, and system and transaction history visibility. Blockchain technology can help build trust, guarantee reliable data, and provide transparency for all parties involved, creating a trustworthy and responsible system.

Participants emphasized the importance of **immutability** in blockchain data, stating that it cannot be altered or tampered with. This ensures integrity and dependability, as data cannot be changed or removed. A non-modifiable audit trail was introduced, emphasizing transparency and trust. Participants also discussed using special identifiers like QR codes to increase uniqueness and traceability. The immutability and irrefutability of data on the blockchain ensure trust, transparency, and authenticity in the digital world.

Interviews highlighted the potential of blockchain (based) systems for **disintermediation** by eliminating middlemen and generating alternative systems without third parties. These systems could eliminate intermediaries like financial institutions, allowing for direct communication and business dealings. They could also eliminate regulatory or governmental middlemen, reducing complexity and potential failure points. Blockchain systems could encourage participant-to-participant communication without third-party intervention and administrative costs. They could also increase autonomy and ownership, challenging established intermediation methods.

The interviews highlighted the significance of **data ownership and privacy** in blockchain (based) systems. Participants expressed a desire to be in charge of their digital possessions, such as books and content. The concept of data vaults and private messaging networks emphasizes data privacy and protection. The right to be forgotten allows people to control their personal data and request removal. Participants expressed concerns about data collection and privacy from major companies like Google or Amazon. The focus was on providing greater control, ownership, and privacy for personal data in a digital environment.

In terms of **regulations**, the interviews highlighted the potential of blockchain (based) systems in enforcing human rights and facilitating compliance with laws. They discussed smart contracts, protocols, transparency, and consensus on disputes. The importance of sound protocols and new laws in the blockchain technology landscape was acknowledged. Blockchain effectively administers protocols and enforces laws, while consensus plays a crucial role in achieving agreements.

The interviews highlighted the importance of **decentralized and distributed** in blockchain (based) systems, emphasizing the advantages of decentralized strategies and Ethereum-like systems. They highlighted the dispersed nature of data storage, the need for a decentralized network, and the public nature of blockchain. Decentralized applications and standalone platforms were also discussed, with participants expressing a need for independent systems to promote innovation and fresh business ideas. The interviews also discussed tokenization, cryptocurrencies, and asset earning and holding through blockchain technology.

The interviews highlighted the importance of blockchain (based) systems for **tracking and tracing** transactions and assets. Participants emphasized the need for transparency and accountability in the supply chain, enabling real-time transaction tracing. Blockchain technology allows for automatic and real-time information exchange, document tracking, and the use of QR codes for tracking goods. Asset traceability has expanded to include lifecycle tracking and compliance with relevant laws. Blockchain offers a real-time, transparent, and auditable tracking system, improving traceability across diverse transactions and assets.

The **security** category of interviews highlighted the importance of using blockchain (based) systems to protect data and ensure privacy. Encrypting data and ensuring express consent are crucial for maintaining information security. Blockchain technology offers privacy benefits, including hiding usernames, making it essential to implement effective security mechanisms to preserve sensitive data within networks.

After conducting the card sorting exercise within the research team, the categories of added values mentioned above have emerged as prominent themes. The team has summarized these categories and provided descriptions and examples for each one, capturing their essence. This summary serves to provide a clear understanding of the identified categories and their associated characteristics, offering a comprehensive overview of the added values explored in the study. The results below were derived based on the specified categories and the performed interviews.

Table 2: Categories added values

Categories of added values	Description	Examples
1. Innovattion	Rare innovative thinking that need not necessarily lead to process improvement or efficiency.	Tokenization of services, mindset change, transform business landscape
2. Process improvement & efficiency	Improve something existing that leads to benefits.	Digital improvement, improve customer experience, simplify processes, more effective, efficient
3. Auditable & validation	Based on your existing rules or legislation, you can perform audits, but also check if rules are properly followed	Automated agreement, verification, participated validation, digital ledger.
4. Data governance	Managing data such as controlling and coordinating data	Coordination, control over data, data empowerment
5. transparancy/reliable	Transparent and open (reliable), all transactions changes and additions are seen and accepted by the entire network	Creditibility, data trust, trustless consensus, integriteit, verandering gezien door iedereen

6. Unmutable	Not modifiable	No changes possible, can not be corrupted, unfalsifiable, tamper-proof, unique data.
7. Disintermediation	Removal of intermediary(s)	No intermediary, no links, less exchange, handover points.
8. Data ownership & privacy	Own data under control and protected, but also be able to release (parts of data), or share without violating privacy.	Data ownership, own data, control identity, no accountability needed, autonomous smart contracts, sovereignty.
9. Regulation	Through rules and/or legislation from higher up (such as government) or mutual agreements on actions to be performed that are recorded through smart contracts.	Legitimacy, regulatory standards, smart contract, fraud prevention measures.
10. Decentralized/ distributed	Not centralized, distributed across multiple nodes via open architecture.	Decentralized ledger, participated governance, open architecture, distributed consensus.
11. Traceerbaarheid & tracking	Data can be traced and tracked from beginning to end of process, including provenance.	Can be tracked, Tracing & tracing, Data provenance, records of goods and content, time-stamped, real-time accessed.
12. Security	Security, active and passive means that help preserve and protect data and prevent fraud or counterfeiting. Authorization, fraud prevention, guaranteed access. Keeping hackers out.	Access trusted data, robust against attacks, enhancing safety, cryptographically validated, proper authorizations.

In appendix 24 the full description of results of added values can be found.

5. Discussion, conclusions, and recommendations

This chapter gives a thorough analysis of the findings from the investigation into the added value of blockchain (based) system and their relation to stakeholders. The main goals of this debate are to clarify the significance and consequences of the findings, assess how they differ from earlier research, and determine how they fit into the body of existing knowledge. This debate seeks to critically evaluate the findings in order to offer insightful analysis and highlight the takeaways.

5.1. Discussion – reflection

The study's initial plan involved a team of four conducting 16 interviews, but the reality turned out to be different. The team was unable to recruit the required number of participants due to lack of interest and time constraints. The researchers also had full-time professional obligations, which limited their time for conducting interviews, evaluating data, and interpreting conclusions. This limited time may have impacted the study's depth and breadth. Additionally, the absence of additional documentation from participants limited the study's breadth and general validity. To achieve a shared understanding, the study team created a definition list and conducted interviews exclusively through Microsoft Teams, with its transcribing feature. This change may have brought new issues, such as restrictions on nonverbal cues or technical aspects on interview dynamics. In conclusion, the study's execution differs from the initial design due to a lack of responses and time constraints, and the researchers' full-time work commitments limited their time for the research. In appendix 25 a full reflection on the technical design can be found.

The many stakeholders in a blockchain (based) system can be connected to the discussion on the added values of those systems:

1. Business Stakeholders: New company roles, revenue streams, and business models are possible with blockchain. It allows for the generation of distinctive tokens, the digitization of business processes, and various business process modifications. These novel options can be advantageous to business stakeholders like shareholders, accounting departments, application owners, and management.
2. Society Stakeholders: Blockchain (based) system may have a disruptive impact on an industry, having an impact on other businesses/clients, those in charge of managing vital infrastructure, and the public. Additionally, it fosters openness, confidence, and social awareness, which is advantageous to travellers as well as other members of the ecosystem and society at large.
3. External Experts: The involvement of external experts in giving knowledge and direction for deploying blockchain (based) system is vital. These professionals may include advisers, legal experts, consultants, and developers. Their participation enhances the perception of innovation and promotes the efficient application of blockchain technology.
4. Users: Consumers, students, and tenants can all gain from blockchain's increased openness, trust, efficiency, and security. They benefit from chances for direct interaction and input, greater data privacy and ownership, and enhanced process efficiency in areas like payment processing, claims management, and content production.
5. Network Management: Banks, financial organizations, and insurers are examples of network management stakeholders who can profit from the efficiency and process enhancements provided by blockchain. Through the removal of middlemen and improved cooperation, they may optimize workflows, decrease administrative hassles, and streamline operations.
6. Redundant Intermediators: Banks, notaries, and insurance companies may become unnecessary intermediates as a result of blockchain technology. Direct interactions and

transactions are made possible by this disintermediation, lowering costs and increasing efficiency for all parties involved.

7. Regulators: In order to ensure compliance and create a regulatory framework for blockchain technology, regulators are essential. They can profit from blockchain's auditable and validating features, which make it easier to comply with regulations and foster accountability and transparency.
8. Technology Providers: Technology suppliers are crucial in providing the systems, tools, and infrastructure required for implementing blockchain solutions. These suppliers include those for building materials, databases, and general technology. Their knowledge and products add to the innovation, effectiveness, and security that blockchain technology offers.

5.2. Conclusions

In summary, blockchain (based) systems open novel opportunities for new business models, revenue streams, and jobs that will benefit company stakeholders and cause industry disruption if companies do not adapt. By streamlining processes, easing administrative hassles, and improving workflows, it also fosters efficiency, which can benefit network management stakeholders and do away with unnecessary middlemen.

Blockchain's auditable and validation features guarantee accurate data recording, verification, and fraud prevention, improving trust and transparency. By offering a visible and responsible structure for tracking and managing transactions while promoting regulatory compliance, this benefits regulators, outside experts, and society stakeholders. Data governance is improved by blockchain's capacity to consolidate and secure data, which also ensures privacy, ownership, and control while providing new methods for managing and governing data.

When using blockchain (based) systems, transparency and trustworthiness are important results because they make data visible to the public, stop data manipulation, and promote trust between parties. Immutability increases the trustworthiness and integrity of data kept on the blockchain, while disintermediation enabled by blockchain facilitates direct interactions, lowering costs, increasing efficiency, and encouraging stakeholder cooperation.

By giving people control and ownership over their data, assuring privacy, data security, and the right to be forgotten, blockchain (based) systems help address issues about data ownership and privacy. Additionally, the decentralized features of blockchain technology disperse data and control across different nodes, reducing risks, boosting resilience, and encouraging a more open and creative ecosystem.

Transparency and accountability for assets, goods, and financial resources are provided by the ability of blockchain (based) systems to record and track transactions from beginning to end. Finally, the decentralized nature of blockchain, along with encryption and permission-based access, assures data security and privacy, safeguarding sensitive information and giving people control over their assets and personal data.

In general, the adoption of blockchain (based) systems has the potential to result in fundamental shifts and provide a wealth of advantages to stakeholders across industries. To properly utilize the additional value of blockchain technology, it is vital to carefully evaluate individual use cases and problems. Organizations may use blockchain to drive innovation, efficiency, transparency, trust, and security by recognizing its potential and matching them with stakeholder demands.

5.3. Recommendations for practice

Here are some suggestions for the use of blockchain (based) systems in real-world applications based on the discussed added value categories and their findings:

1. Identify appropriate use cases: Analyse your business procedures and pinpoint areas where blockchain technology might add a lot of value. Look for procedures that demand openness, traceability, involvement of numerous parties, or the handling of private information.
2. Carry out feasibility studies: Before putting blockchain into use, carry out feasibility studies to determine the solution's technical and financial sustainability. Think about things like cost, interoperability, scalability, and potential effects on current systems.
3. Work together with stakeholders: Incorporate partners, suppliers, and customers as well as other pertinent parties into the development and application of blockchain solutions. Collaboration can assist guarantee the success and widespread use of the technology.
4. Ensure data integrity and accuracy: Adopt appropriate data validation standards and processes to guarantee the integrity and correctness of data stored on the blockchain. This covers safeguards like electronic signatures, audit trails, and cryptographic methods.
5. Address legal and regulatory issues: Keep up with the legal standards and regulatory environment surrounding blockchain technology in your sector. To preserve confidence and reduce legal risks, make sure that data protection, privacy, and security standards are followed.
6. Put security first: Put strong security measures in place to safeguard sensitive data and thwart illegal access. To protect the blockchain infrastructure and user data, use encryption, access controls, and multi-factor authentication.
7. Provide user education and training: Inform personnel, partners, and users of the advantages of blockchain technology and how to deal with such systems. Provide training courses to ensure effective technological comprehension and application.
8. Pilot initiatives and gradual adoption: Begin with pilot initiatives to examine the viability and efficiency of blockchain solutions in practical contexts. Based on the success of the initial projects and the lessons learned, gradually scale up the implementation.
9. Track performance and impact of deployed blockchain technologies, then adjust, as necessary. Obtain user and stakeholder feedback, then make the required changes to increase efficiency and address any problems or restrictions.

Organizations may utilize the advantages of blockchain technology and unleash its potential to revolutionize several aspects of their operations, processes, and connections with stakeholders by heeding these tips.

5.4. Recommendations for further research

Further research can greatly contribute to a deeper understanding of blockchain (based) systems and their successful deployment. Here are some suggested areas for additional study:

1. Empirical research on added value categories: Conduct empirical research across various sectors and use cases to confirm and measure the added value of blockchain (based) systems. This research can involve data gathering, surveys, and assessments of variables such as effectiveness, cost savings, transparency, and confidence resulting from blockchain implementation.

2. User perception and acceptance: Investigate how users, stakeholders, and the general public perceive and adopt blockchain technology. Explore factors influencing acceptance, privacy and security concerns, and strategies to enhance user confidence in blockchain services.
3. Comparative analysis: Perform comparative studies to assess the value added by blockchain compared to other technologies or established systems. Compare blockchain's advantages, limitations, and trade-offs with centralized databases, traditional intermediaries, or other cutting-edge technologies.
4. Legal and regulatory implications: Research the legal and regulatory implications of implementing blockchain, especially in industries with strict compliance standards like finance, healthcare, and supply chain. Identify best practices for legal compliance and explore opportunities and challenges in integrating blockchain with existing regulations.
5. Scalability and performance optimization: Investigate methods to improve the scalability and performance of blockchain systems, particularly for large-scale deployments. Explore techniques such as sharing, sidechains, and consensus process enhancements to overcome scalability limitations.
6. Privacy-preserving methods: Explore privacy-preserving methods in blockchain to enhance data security while maintaining transparency and auditability. Investigate advancements in secure multi-party computation, homomorphic encryption, and zero-knowledge proofs to enable private transactions and data sharing.
7. Interoperability in blockchain ecosystems: Investigate the prospects and challenges of achieving interoperability between different blockchain networks and conventional systems. Explore frameworks, protocols, and interoperability standards to facilitate seamless data exchange and communication.
8. Environmental impact assessment: Examine the environmental effects of blockchain technology, particularly in terms of energy consumption and carbon emissions. Explore strategies to reduce the environmental footprint of blockchain networks, including eco-friendly infrastructure designs and integration of renewable energy sources.
9. Ethical considerations: Analyse the ethical implications of blockchain technology, considering aspects such as data ownership, consent management, algorithmic fairness, and social and economic inequality. Investigate frameworks for responsible blockchain adoption and governance to ensure moral and just outcomes.
10. Long-term sustainability and evolution: Study the long-term sustainability of blockchain systems. Investigate upgrade mechanisms, governance structures, and financial incentives to promote community engagement, network integrity, and the continued usefulness of blockchain technology.

By focusing on these research recommendations, scholars and practitioners can contribute to the ongoing development and practical application of blockchain technology. It is crucial to validate and refine the established categories of added values through empirical investigations to ensure their accuracy and relevance in real-world scenarios.

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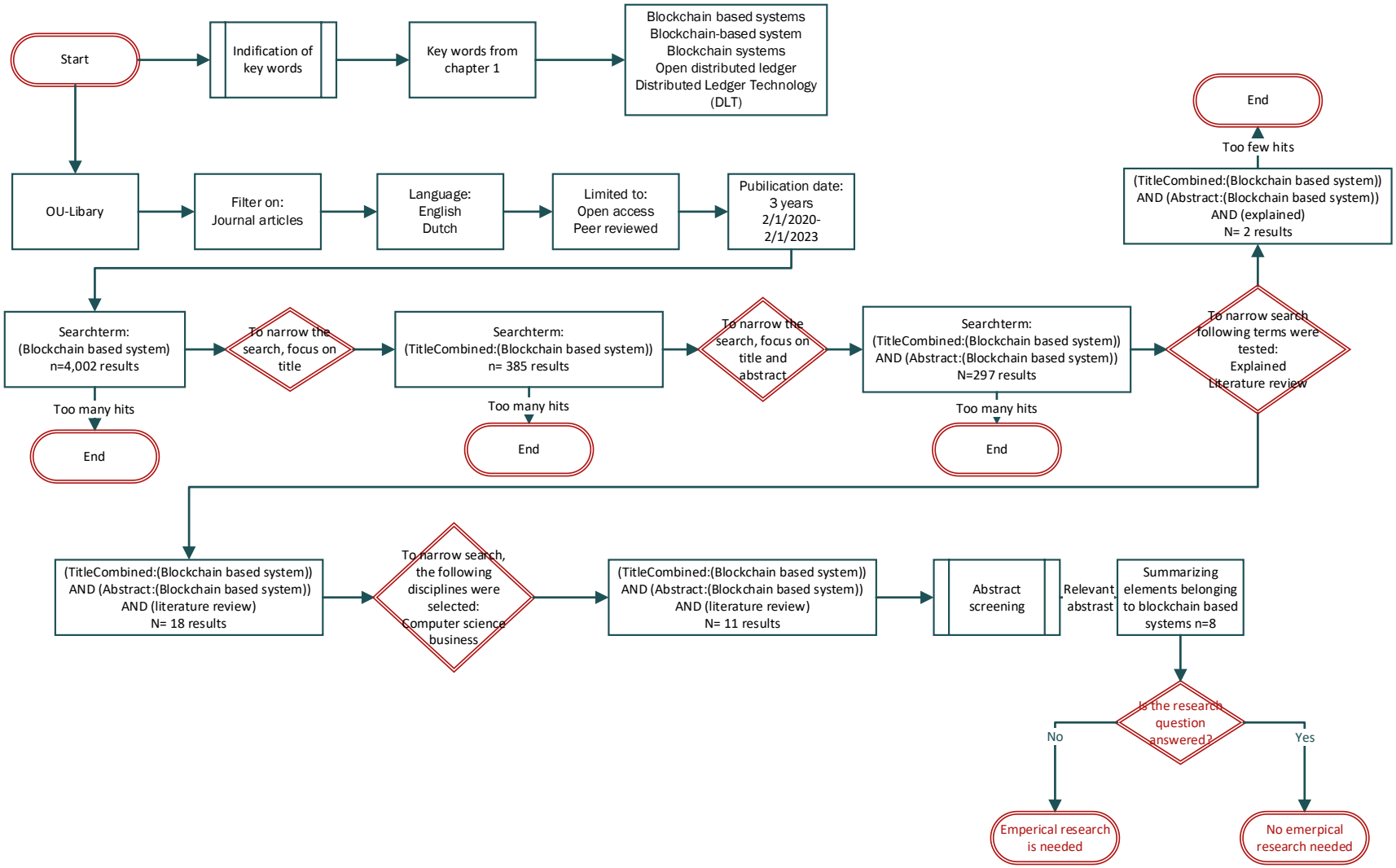
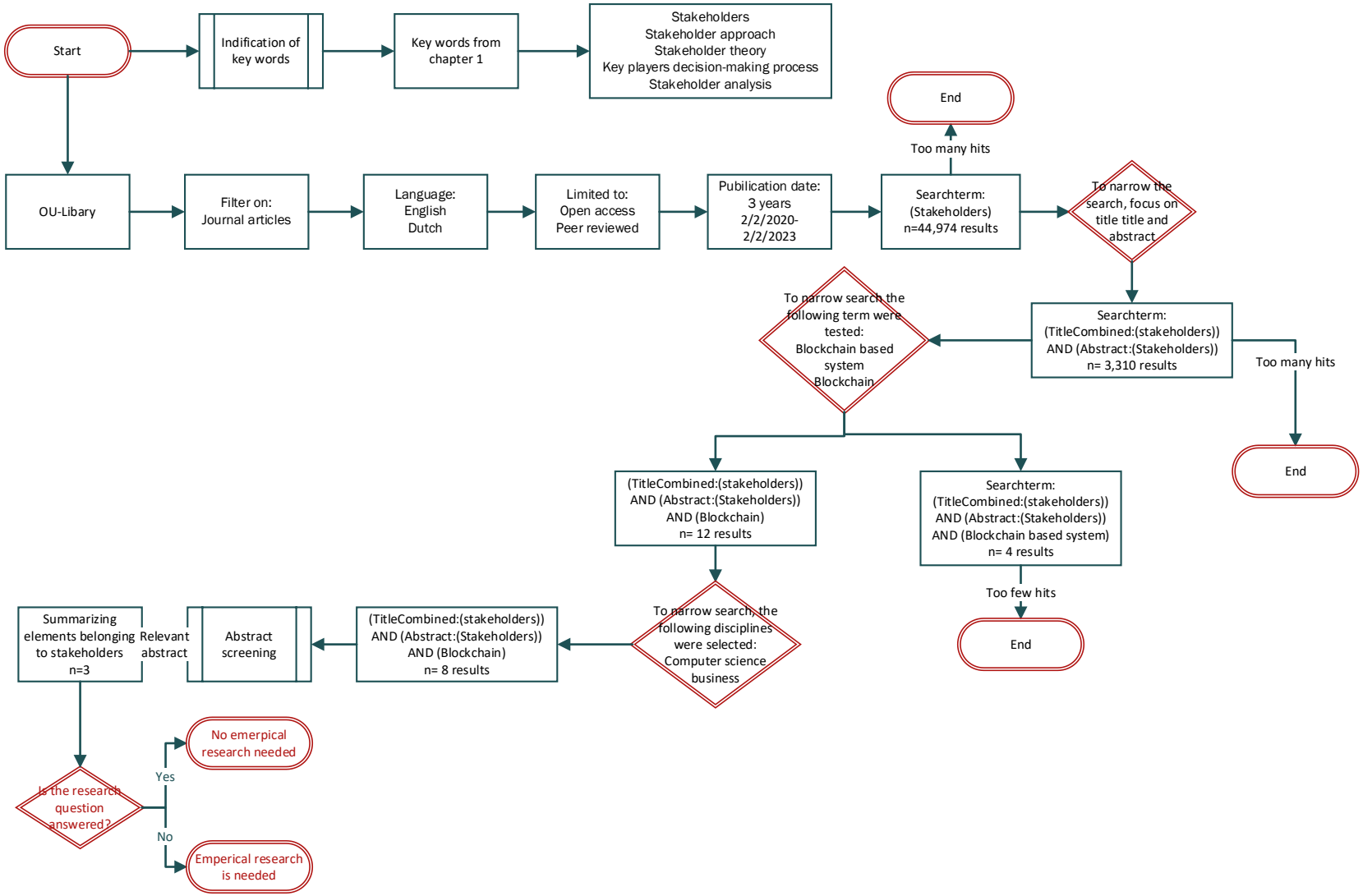
Appendix

Appendix 1: Literature study

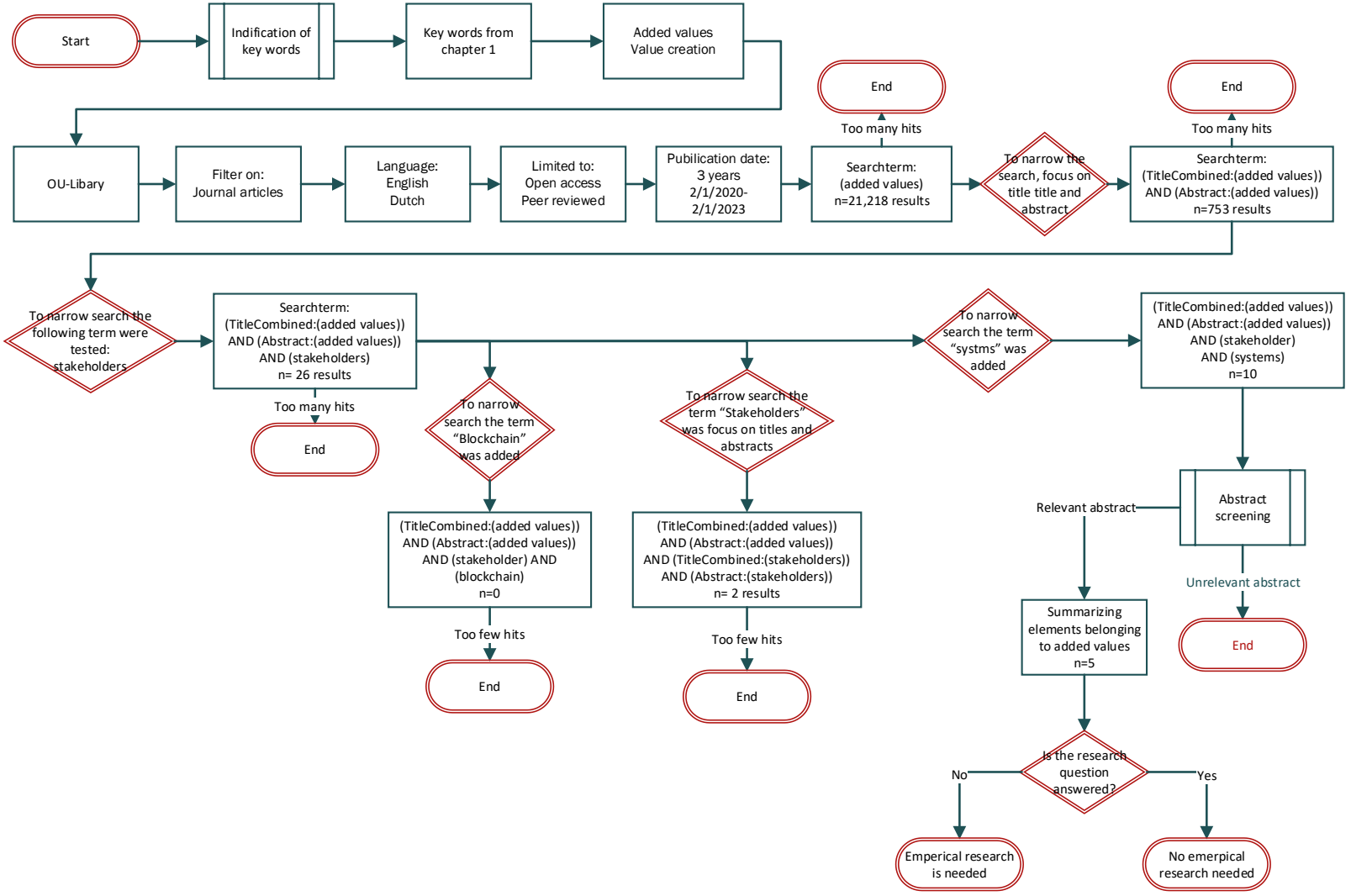
Blockchain (based) systems



Stakeholders



Added values



Summary blockchain (based) systems articles

Title	Citation
1. Towards roadmap to implement blockchain in healthcare systems based on a maturity model	Akbar, M. A., Leiva, V., Rafi, S., Qadri, S. F., Mahmood, S., & Alsanad, A. (2022). Towards roadmap to implement blockchain in healthcare systems based on a maturity model. Journal of Software : Evolution and Process, 34(12), n/a. https://doi.org/10.1002/smr.2500
2. Blockchain (based) Identity Management Systems in Health IoT: A Systematic Review	Alamri, B., Crowley, K., & Richardson, I. (2022). Blockchain (based) identity management systems in health IoT: A systematic review. IEEE Access, 10, 1-1. https://doi.org/10.1109/ACCESS.2022.3180367
3. Intrusion detection system for the internet of things based on blockchain and multi-agent systems	Liang, C., Shanmugam, B., Azam, S., Karim, A., Islam, A., Zamani, M., Kavianpour, S., & Idris, N. B. (2020). Intrusion detection system for the internet of things based on blockchain and multi-agent systems. Electronics (Basel), 9(7), 1120. https://doi.org/10.3390/electronics9071120
4. Blockchain (based) electronic medical records system with smart contract and consensus algorithm in cloud environment	Dwivedi, S. K., Amin, R., Lazarus, J. D., & Pandi, V. (2022). Blockchain (based) electronic medical records system with smart contract and consensus algorithm in cloud environment. Security and Communication Networks, 2022, 1-10. https://doi.org/10.1155/2022/4645585
5. Identity model for blockchain (based) land registry system: A comparison.	Shuaib, M., Hafizah Hassan, N., Usman, S., Alam, S., Bhatia, S., Koundal, D., Mashat, A., & Belay, A. (2022). Identity model for blockchain (based) land registry system: A comparison. Wireless Communications and Mobile Computing, 2022, 1-17. https://doi.org/10.1155/2022/5670714
6. Systematic review on AI-blockchain (based) E-healthcare records management systems	Haddad, A., Habaebi, M. H., Islam, M. R., Hasbullah, N. F., & Zabidi, S. A. (2022). Systematic review on AI-blockchain (based) E-healthcare records management systems. IEEE Access, 10, 1-1. https://doi.org/10.1109/ACCESS.2022.3201878
7. Blockchain (based) identity management system and self-sovereign identity ecosystem: A comprehensive survey	Ahmed, M. R., Islam, A. K. M. Muzahidul, Shatabda, S., & Islam, S. (2022). Blockchain (based) identity management system and self-sovereign identity ecosystem: A comprehensive survey. IEEE Access, 10, 113436-113481. https://doi.org/10.1109/ACCESS.2022.3216643
8. A survey on blockchain (based) IoMT systems: Towards scalability	Adavoudi Blockchain (based), A., Aghili, S. F., & Singelee, D. (2021). A survey on blockchain (based) IoMT systems: Towards scalability. IEEE Access, 9, 148948-148975. https://doi.org/10.1109/ACCESS.2021.3117662

A Proposed Conceptual Framework for Blockchain Systems (grey literature)	Tesselhof, K., Kusters, R. J., Janssens, G. L. S. G., & Veuger, J. (2020). A proposed conceptual framework for blockchain systems. (). Nova Science Publishers, Inc.

1. Towards roadmap to implement blockchain in healthcare systems based on a maturity model

The article presents a roadmap to implement blockchain in healthcare systems based on a maturity model. The authors discuss the potential benefits of using blockchain technology in healthcare, such as improved data security, interoperability, and patient control over their health data. They also identify the challenges of implementing blockchain in healthcare, including legal and regulatory issues, technical complexity, and adoption barriers. To address these challenges, the authors propose a maturity model consisting of five levels of blockchain implementation, from basic to advanced. The model provides guidance for healthcare organizations to assess their readiness for blockchain adoption and to develop a roadmap for implementation. The authors conclude that the successful implementation of blockchain in healthcare requires collaboration among stakeholders and a clear understanding of the benefits and limitations of the technology.

2. Blockchain (based) Identity Management Systems in Health IoT: A Systematic Review

The article presents a systematic review of blockchain (based) identity management systems in health IoT. The authors discuss the potential benefits of using blockchain technology for identity management in health IoT, including improved security, privacy, and interoperability. They also identify the challenges of implementing blockchain (based) identity management systems, such as scalability, usability, and regulatory compliance. To address these challenges, the authors review the existing literature on blockchain (based) identity management systems in health IoT and analyze the design, features, and performance of these systems. They also discuss the limitations and open research issues in this area, such as the need for standardization, evaluation, and user acceptance studies. The authors conclude that blockchain (based) identity management systems have the potential to enhance the security and privacy of health IoT, but further research is needed to address the technical, organizational, and social challenges of their implementation.

3. Intrusion detection system for the internet of things based on blockchain and multi-agent systems

The article proposes an Intrusion Detection System (IDS) based on blockchain and multi-agent systems for the Internet of Things (IoT) security. The IDS architecture consists of an IoT layer, an agent layer, and a blockchain layer. The IoT layer collects data from sensors, and the agent layer analyzes and processes the data to identify potential security threats. The blockchain layer provides a decentralized and tamper-proof platform to store the IDS data. The proposed system is evaluated against various attack scenarios, and the results show its effectiveness in detecting and preventing security threats in IoT networks.

4. Blockchain (based) electronic medical records system with smart contract and consensus algorithm in cloud environment

The paper presents a blockchain (based) electronic medical records system with smart contract and consensus algorithm in the cloud environment. The proposed system is designed to address security and privacy concerns while facilitating secure access to medical records. The smart contract is used to ensure the transparency and immutability of the system, while the consensus algorithm provides

a secure and decentralized means of verifying transactions. The system is also designed to be scalable, efficient, and cost-effective. The paper highlights the potential of blockchain technology in improving the security, privacy, and accessibility of electronic medical records systems.

5. Identity model for blockchain (based) land registry system: A comparison.

The article discusses the implementation of a blockchain (based) land registry system with an identity model. The authors compare two identity models - a centralized model and a decentralized model - for their effectiveness in ensuring the integrity and security of the land registry system. The study uses a qualitative approach to identify the key features and limitations of each model. The authors conclude that the decentralized model is more secure, transparent, and less susceptible to fraud compared to the centralized model. They argue that the decentralized model can provide an efficient and reliable solution for land registry systems, especially in developing countries.

6. Systematic review on AI-blockchain (based) E-healthcare records management systems

The paper presents a systematic review of AI-Blockchain (based) E-healthcare records management systems (EBRMS). The authors identified 29 studies from various databases that met the inclusion criteria and discussed the various aspects of EBRMS. They categorized the studies into three categories: (i) data privacy and security, (ii) data sharing and accessibility, and (iii) data integrity and immutability. The paper highlighted the importance of AI in EBRMS, especially in the areas of data analytics, decision-making, and patient diagnosis. Furthermore, the study identified several challenges to the implementation of EBRMS, such as lack of standards, interoperability issues, and the high cost of implementation. Finally, the authors proposed some future research directions to address the challenges and gaps in the existing EBRMS.

7. Blockchain (based) identity management system and self-sovereign identity ecosystem: A comprehensive survey

The article provides a comprehensive survey of blockchain (based) identity management systems (IMS) and self-sovereign identity (SSI) ecosystems. It explains the fundamental concepts and characteristics of IMS and SSI, including their features, requirements, and challenges. The authors also explore the potential benefits of IMS and SSI in various fields, such as finance, healthcare, and education, and discuss the existing blockchain (based) IMS and SSI platforms. The article further presents a detailed analysis of the key challenges and open research issues in blockchain (based) IMS and SSI ecosystems. It concludes by highlighting the research directions and future prospects for IMS and SSI in blockchain (based) ecosystems.

8. A survey on blockchain (based) IoMT systems: Towards scalability

The paper is a survey that focuses on the use of blockchain technology in the Internet of Medical Things (IoMT) systems. The paper highlights the potential benefits of using blockchain technology in IoMT systems, such as secure and transparent data storage, tamper-proof data exchange, and efficient interoperability. The authors also discuss the challenges and limitations of using blockchain in IoMT systems, such as scalability, privacy, and regulation. Additionally, the paper explores some of the recent research and development efforts in the field of blockchain (based) IoMT systems and provides insights into the future prospects of this technology. Overall, the paper provides a comprehensive review of the current state of the art in blockchain (based) IoMT systems and highlights the need for further research to address the existing challenges and limitations.

Summary stakeholders articles

Title	Citation
1. Blockchain technology implementation challenges in supply chains – evidence from the case studies of multi-stakeholders.	Yadlapalli, A., Rahman, S., & Gopal, P. (2022). Blockchain technology implementation challenges in supply chains – evidence from the case studies of multi-stakeholders. The International Journal of Logistics Management, 33(5), 278-305. https://doi.org/10.1108/IJLM-02-2021-0086
2. Understanding the Determinants of Blockchain Adoption in the Engineering-Construction Industry: Multi-Stakeholders' Analyses	Cheng, M., & Chong, H. (2022). Understanding the determinants of blockchain adoption in the engineering-construction industry: Multi-stakeholders' analyses. IEEE Access, 10, 108307-108319. https://doi.org/10.1109/ACCESS.2022.3213714
3. Exploring interpretations of blockchain's value in healthcare: a multi-stakeholder approach	Palas, M. J. U., & Bunduchi, R. (2020). Exploring interpretations of blockchain's value in healthcare: a multi-stakeholder approach. Information technology & people, 34(2), 453-495.
Business models and opportunity creation: how IT entrepreneurs create and develop business models under uncertainty (snowball literature)	Ojala, A. (2016), "Business models and opportunity creation: how IT entrepreneurs create and develop business models under uncertainty", Information Systems Journal, Vol. 26 No. 5, pp. 451-476
A model-driven framework to support strategic agility: Value-added perspective (grey literature)	see added values articles
Different types of entities can be stakeholders, such as people, groups within and outside the organization	Tesselhof, K., & Veuger, J. (2019). Complexity Perception Among Stakeholders of Blockchain Implementations: Can We Use a Measuring Instrument for this?. International Journal of Applied Science, 2(3), p51-p51.

1. Blockchain technology implementation challenges in supply chains – evidence from the case studies of multi-stakeholders.

The article by Yadlapalli, Rahman, and Gopal (2022) examines the challenges of implementing blockchain technology in supply chains, with a focus on the perspectives of multiple stakeholders. The authors argue that blockchain technology has the potential to enhance supply chain transparency, traceability, and security, but its implementation requires collaboration and coordination among various stakeholders, including suppliers, manufacturers, logistics providers, regulators, and consumers.

The study uses a qualitative case study approach to analyze the implementation challenges of blockchain technology in three supply chain contexts: seafood, pharmaceuticals, and electronics. The authors conducted interviews with stakeholders involved in each supply chain, including suppliers, manufacturers, regulators, and consumers, to understand their perceptions of the benefits and challenges of blockchain technology.

The authors found that the implementation of blockchain technology in supply chains involves several challenges related to technology, governance, and trust. Technological challenges include the complexity and cost of implementing blockchain systems, the interoperability with existing systems, and the scalability of the technology. Governance challenges include the need for standards and regulations, the allocation of responsibilities and liabilities, and the alignment of incentives and interests. Trust challenges include the establishment of trust among stakeholders, the protection of data privacy and security, and the management of risks and uncertainties.

Overall, the study by Yadlapalli, Rahman, and Gopal highlights the importance of stakeholder collaboration and coordination in the implementation of blockchain technology in supply chains. The authors emphasize the need for addressing the challenges related to technology, governance, and trust to ensure the successful adoption and diffusion of blockchain technology in supply chains.

2. Understanding the Determinants of Blockchain Adoption in the Engineering-Construction Industry: Multi-Stakeholders' Analyses

The article by Cheng and Chong (2022) examines the determinants of blockchain adoption in the engineering-construction industry from the perspective of multiple stakeholders. The authors argue that blockchain technology has the potential to address the challenges of trust, transparency, and coordination in the engineering-construction industry, but its adoption requires the collaboration and coordination among various stakeholders, including owners, contractors, designers, suppliers, regulators, and customers.

The study uses a survey approach to analyze the determinants of blockchain adoption in the engineering-construction industry. The authors surveyed 184 stakeholders involved in the engineering-construction industry, including owners, contractors, designers, suppliers, regulators, and customers, to understand their perceptions of the benefits and challenges of blockchain technology and the factors that influence their adoption decisions.

The authors found that the adoption of blockchain technology in the engineering-construction industry is influenced by various factors related to technology, organization, environment, and stakeholder characteristics. Technological factors include the perceived usefulness and ease of use of blockchain technology, the compatibility with existing systems, and the security and privacy concerns. Organizational factors include the availability of resources, the level of IT infrastructure, the support from top management, and the organizational culture. Environmental factors include the regulatory and legal frameworks, the level of industry collaboration, and the market competition. Stakeholder characteristics include the level of education and experience, the risk tolerance, and the level of trust among stakeholders.

Overall, the study by Cheng and Chong highlights the importance of stakeholder collaboration and coordination in the adoption of blockchain technology in the engineering-construction industry. The authors emphasize the need for addressing the factors related to technology, organization, environment, and stakeholder characteristics to ensure the successful adoption and diffusion of blockchain technology in the engineering-construction industry.

3. Exploring interpretations of blockchain's value in healthcare: a multi-stakeholder approach

Palas and Bunduchi's (2020) article explores the interpretation of blockchain's value in healthcare through a multi-stakeholder approach. The authors argue that the potential benefits of blockchain technology in healthcare can only be realized through collaboration and engagement of various

stakeholders, including patients, healthcare providers, regulators, technology developers, and other stakeholders.

The study employs a qualitative research design that involves semi-structured interviews with 25 stakeholders from different sectors of the healthcare industry. The participants were selected based on their expertise, knowledge, and involvement in blockchain technology in healthcare.

The authors found that the value of blockchain technology in healthcare is perceived differently by various stakeholders. The study identified three main themes that reflect the different interpretations of blockchain's value in healthcare. The first theme is "Efficiency and Effectiveness," which focuses on the potential of blockchain technology to improve healthcare delivery and outcomes by enabling secure and timely access to patient data, enhancing care coordination, and reducing administrative burdens. The second theme is "Transparency and Trust," which emphasizes the potential of blockchain technology to enhance the transparency and accountability of healthcare systems by enabling secure and decentralized sharing of data and reducing the risks of data breaches and cyberattacks. The third theme is "Patient Empowerment," which highlights the potential of blockchain technology to empower patients by giving them greater control over their health data and enabling them to participate more actively in their care.

The authors conclude that the interpretation of blockchain's value in healthcare is context-dependent and influenced by the stakeholders' perspectives, interests, and goals. The study highlights the importance of stakeholder engagement and collaboration in realizing the potential benefits of blockchain technology in healthcare. The authors suggest that future research should focus on developing a more nuanced understanding of the role of blockchain technology in healthcare and its potential implications for various stakeholders.

Summary added values articles

Title	Citation
1. Assessing chemical risk within an ecosystem services framework: Implementation and added value	Maltby, L., Brown, R., Faber, J. H., Galic, N., Van den Brink, Paul J., Warwick, O., & Marshall, S. (2021). Assessing chemical risk within an ecosystem services framework: Implementation and added value. The Science of the Total Environment, 791, 148631-148631. https://doi.org/10.1016/j.scitotenv.2021.148631
2. Added Value of Electronic Immunization Registries in Low- and Middle-Income Countries: Observational Case Study in Tanzania	Secor, A. M., Mtenga, H., Richard, J., Bulula, N., Ferriss, E., Rathod, M., Ryman, T. K., Werner, L., & Carnahan, E. (2022). Added value of electronic immunization registries in low- and middle-income countries: Observational case study in tanzania. JMIR Public Health and Surveillance, 8(1), e32455-e32455. https://doi.org/10.2196/32455
3. Risk Assessment With Value Added Pythagorean Fuzzy Failure Mode and Effect Analysis for Stakeholders	Aguirre, P. A. G., Perez-Dominguez, L., Luviano-Cruz, D., Gomez, E. M., Olguin, Ivan Juan Carlos Perez, & Ramirez, J. O. D. (2021). Risk assessment with value added pythagorean fuzzy failure mode and effect analysis for stakeholders. IEEE Access, 9, 149560-149568. https://doi.org/10.1109/ACCESS.2021.3124480
4. Assessing collaborative planning and the added value of planning support apps in The Netherlands	Lin, Y., & Benneker, K. (2022). Assessing collaborative planning and the added value of planning support apps in the netherlands. Environment and Planning. B, Urban Analytics and City Science, 49(2), 391-410. https://doi.org/10.1177/23998083211009239
5. A model-driven framework to support strategic agility: Value-added perspective	Tsilionis, K., & Wautelet, Y. (2022;2021;). A model-driven framework to support strategic agility: Value-added perspective. Information and Software Technology, 141, 106734-106734. https://doi.org/10.1016/j.infsof.2021.106734

1. Assessing chemical risk within an ecosystem services framework: Implementation and added value

The article by Maltby et al. (2021) discusses the implementation and added value of assessing chemical risks within an ecosystem services framework. The authors emphasize that the traditional approach to chemical risk assessment, which focuses on individual species and their responses to chemicals, is not sufficient to fully understand the impacts of chemical exposure on ecosystems and their services. Instead, they propose an ecosystem services approach, which considers the relationships between ecosystem functions, services, and human well-being.

The authors describe the process of applying this framework to a case study involving the River Thames in the United Kingdom. They identify multiple ecosystem services provided by the river, such as water supply, recreation, and biodiversity, and assess the potential impacts of chemicals on each

of these services. They also consider the potential synergistic effects of multiple stressors, such as chemicals and climate change, on ecosystem services.

The authors argue that the ecosystem services approach provides several added values compared to traditional chemical risk assessment. Firstly, it allows for a more holistic understanding of the impacts of chemical exposure on ecosystems and their services. Secondly, it helps to identify trade-offs between different services and prioritize management actions that can maximize benefits to human well-being. Finally, it facilitates communication between scientists, policy-makers, and other stakeholders, as it provides a common language and framework for discussing the impacts of chemical exposure on ecosystems and their services.

Overall, the article by Maltby et al. highlights the importance of considering ecosystem services in chemical risk assessment and management, and provides a practical example of how this can be done.

2. Added Value of Electronic Immunization Registries in Low- and Middle-Income Countries: Observational Case Study in Tanzania

The article by Secor et al. (2022) investigates the added value of electronic immunization registries (EIRs) in low- and middle-income countries, using Tanzania as a case study. The authors argue that traditional paper (based) immunization systems in these countries are often unreliable and incomplete, leading to challenges in monitoring vaccination coverage and identifying individuals in need of additional vaccinations.

The study evaluates the implementation of an EIR in Tanzania, which digitized the immunization records of children and provided real-time data on vaccination coverage and missed opportunities for vaccination. The authors conducted interviews and surveys with healthcare workers, caregivers, and policymakers to assess the impact of the EIR on the immunization system.

The authors found that the EIR provided several added values compared to traditional paper (based) systems. Firstly, it improved the completeness and accuracy of immunization data, allowing for more reliable monitoring of vaccination coverage and identification of underserved populations. Secondly, it facilitated communication between healthcare workers, caregivers, and policymakers, enabling more coordinated and efficient delivery of immunization services. Finally, it supported decision-making and planning at all levels of the health system, from individual clinics to national programs.

Overall, the study by Secor et al. demonstrates the added value of EIRs in improving the effectiveness and efficiency of immunization systems in low- and middle-income countries. The authors highlight the potential for EIRs to enhance data quality, communication, and decision-making, and argue that these systems should be prioritized in efforts to improve immunization coverage and reduce vaccine-preventable diseases.

3. Risk Assessment With Value Added Pythagorean Fuzzy Failure Mode and Effect Analysis for Stakeholders

The article by Aguirre et al. (2021) discusses the application of value-added Pythagorean fuzzy failure mode and effect analysis (VA-PFFMEA) for risk assessment in different stakeholders. The authors argue that traditional failure mode and effect analysis (FMEA) methods are limited in their ability to account for uncertainties and subjective judgments, and may not fully capture the perspectives and priorities of different stakeholders involved in risk assessment.

The VA-PFFMEA approach proposed in the study incorporates Pythagorean fuzzy sets, which allow for more flexible and nuanced representation of uncertain and subjective information. It also includes a value-added component, which aims to integrate the perspectives and priorities of different stakeholders in the risk assessment process.

The authors apply the VA-PFFMEA approach to a case study involving a hydraulic system in a manufacturing plant. They evaluate the potential failure modes and their impacts on the system's performance, and assess the risks associated with each failure mode from the perspectives of different stakeholders, such as operators, maintenance personnel, and management.

The authors found that the VA-PFFMEA approach provided several added values compared to traditional FMEA methods. Firstly, it allowed for more comprehensive and nuanced assessment of risks, accounting for uncertainties and subjective judgments. Secondly, it facilitated communication and collaboration between stakeholders, enabling more informed and effective decision-making. Finally, it provided a transparent and accountable risk assessment process, which can enhance trust and confidence among stakeholders.

Overall, the study by Aguirre et al. highlights the potential of VA-PFFMEA approach in improving the effectiveness and transparency of risk assessment in various fields, including engineering and management. The authors argue that this approach can provide added values by integrating the perspectives and priorities of different stakeholders, improving the accuracy and completeness of risk assessment, and promoting communication and collaboration among stakeholders.

4. Assessing collaborative planning and the added value of planning support apps in The Netherlands

The article by Lin and Benneker (2022) explores the added value of planning support apps (PSAs) in collaborative planning processes in the Netherlands. The authors argue that collaborative planning requires effective communication and coordination among stakeholders with diverse perspectives and interests, and that PSAs can enhance these processes by providing accessible and interactive tools for data visualization, analysis, and decision-making.

The study evaluates the use of PSAs in three case studies of collaborative planning processes in the Netherlands, focusing on their impact on stakeholder engagement, information sharing, and decision-making. The authors conducted interviews and surveys with stakeholders involved in the planning processes to assess their perceptions of the added value of PSAs.

The authors found that PSAs provided several added values compared to traditional planning methods. Firstly, they enhanced stakeholder engagement and participation by providing accessible and user-friendly tools for data visualization and analysis. Secondly, they improved information sharing and transparency, enabling stakeholders to access and contribute to a shared pool of knowledge. Finally, they supported decision-making by providing real-time feedback on the implications of different planning scenarios, and facilitating collaboration and consensus-building among stakeholders.

Overall, the study by Lin and Benneker demonstrates the added value of PSAs in collaborative planning processes in the Netherlands. The authors highlight the potential for PSAs to enhance stakeholder engagement, information sharing, and decision-making, and argue that these tools should be integrated into planning processes to improve their effectiveness and efficiency..

5. A model-driven framework to support strategic agility: Value-added perspective

The article by Tsilionis and Wautelet (2022) proposes a model-driven framework for supporting strategic agility, with a focus on the added value perspective. The authors argue that strategic agility is critical for organizations to adapt to changing environments and maintain a competitive advantage, and that a model-driven approach can help organizations to anticipate and respond to changes in a systematic and efficient manner.

The proposed framework consists of three main components: a model (based) strategy development process, a value (based) evaluation process, and a model (based) decision-making process. The authors apply the framework to a case study involving a software development company, demonstrating its effectiveness in supporting strategic agility.

The authors highlight the added value perspective as a key feature of the framework, which allows organizations to identify and prioritize value-added activities and resources, and align their strategies and decisions accordingly. They argue that this perspective can help organizations to optimize their performance and outcomes, and to maintain a competitive advantage in dynamic and uncertain environments.

Overall, the study by Tsilionis and Wautelet contributes to the literature on strategic agility and provides a practical framework for organizations to support their agility efforts. The authors highlight the importance of a model-driven approach and a value-added perspective in achieving strategic agility, and demonstrate the potential of their framework in improving organizational performance and outcomes.

Firstly, there will be an explanation given of what a qualitative and quantitative research is. Then seven research strategies will be categorised (in a qualitative or quantitative research) and further explained. The research strategies presented below, are discussed using the research union of(Saunders et al., 2019), which is presented below.

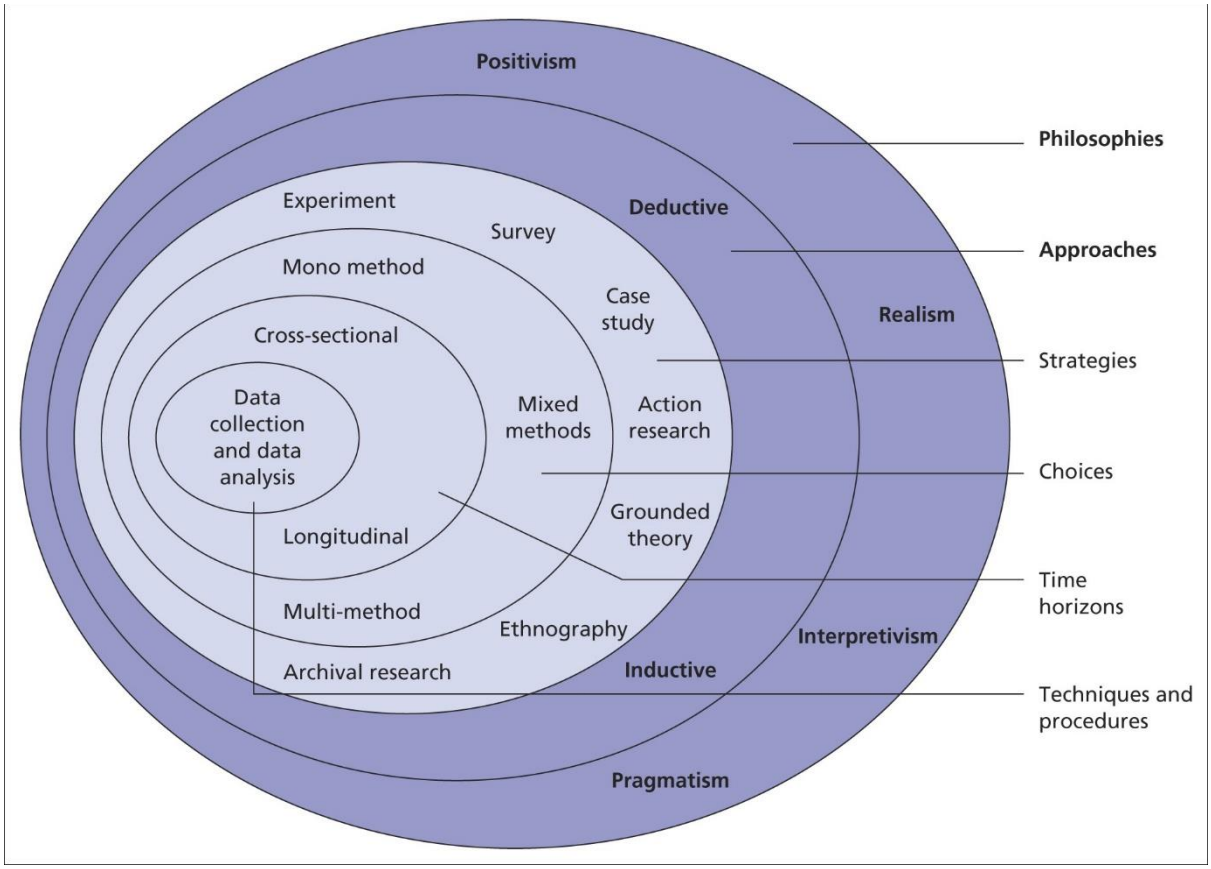


Figure 3: Research union (Saunders et al., 2019)

One way of differentiating quantitative research from qualitative research is to distinguish between numeric data (numbers) and non-numeric data (words, images, video clips and other similar material). In this way, 'quantitative' is often used as a synonym for any data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data. In contrast, 'qualitative' is often used as a synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorising data) that generates or uses non- numerical data. This is an important way to differentiate (Saunders et al., 2019).

Quantitative research examines relationships between variables, which are measured numerically and analysed using a range of statistical and graphical techniques. It often incorporates controls to ensure the validity of data, as in an experimental design. Because data is collected in a standard manner, it is important to ensure that questions are expressed clearly so they are understood in the same way by each participant. Quantitative research is principally associated with experimental and survey research strategies. In quantitative research, a survey research strategy is normally conducted through the use of questionnaires or structured interviews or, possibly, structured observation (Saunders et al., 2019).

Qualitative research studies participants' meanings and the relationships between them, using a variety of data collection techniques and analytical procedures, to develop a conceptual framework and theoretical contribution. Qualitative research is associated with a variety of strategies. While these share ontological and epistemological roots and common characteristics, each strategy has a specific emphasis and scope as well as a particular set of procedures. Some of the principal strategies used with qualitative research are: action research, archival research, case study research, ethnography and Grounded Theory. Some of these strategies can also be used in a quantitative research design such as a case study strategy, or used in a mixed methods research design (Saunders et al., 2019).

The 7 research strategies will be explained below:

An **experimen**t's objective is to determine the likelihood that a change in one variable (an independent variable) would result in a change in another (dependent variable). Research questions are not used in experiments; instead, hypotheses are predictions. This is so that the researcher can foresee whether a relationship between the variables will be present. Therefore, the nature of your study issue will determine if adopting an experimental technique is feasible. An experiment is a suitable tactic if you can turn your research question into hypotheses where you want to test for expected links between variables. However, rather than testing a hypothesized association, the majority of business and management research questions will be created to look into the correlations between variables. (Saunders et al., 2019)

A **survey** is a popular and common strategy in business and management research and is most frequently used to answer 'what', 'who', 'where', 'how much' and 'how many' questions. It therefore tends to be used for exploratory and descriptive research. Survey strategies can use questionnaires, structured observation and structured interviews as a data collection technique (Saunders et al., 2019).

A **case study** is an in-depth inquiry into a topic or phenomenon within its real-life setting (Yin 2014). The 'case' in case study research may refer to a person (e.g. a manager), a group (e.g. a work team), an organisation (e.g. a business), an association (e.g. a joint venture), a change process (e.g. restructuring a company), an event (e.g. an annual general meeting) as well as many other types of case subject (Saunders et al., 2019).

The purpose of an **Action Research** strategy is to promote organisational learning to produce practical outcomes through identifying issues, planning action, taking action and evaluating action. An Action Research strategy commences within a specific context and with a research question but because it works through several stages or iterations the focus of the question may change as the research develops (Saunders et al., 2019).

Grounded Theory is used to develop theoretical explanations of social interactions and processes in a wide range of contexts, including business and management. As much of business and management is about people's behaviours, for example consumers' or employees', a Grounded Theory strategy can be used to explore a wide range of business and management issues (Saunders et al., 2019).

Ethnography is used to study the culture or social world of a group. Ethnography literally means a written account of a people or ethnic group. It is the earliest qualitative research strategy, with its origins in colonial anthropology. , ethnography was developed to study cultures in so-called 'primitive' societies that had been brought under the rule of a colonial power, to facilitate imperialist control and administration (Saunders et al., 2019).

The digitalisation of data and the creation of online archives have increased the scope for you to use an **archival or documentary research** strategy. Because of the Internet and the digitalisation of university (based), governmental, organisational and media documents and other data, it is now possible to access such sources from around the world. This potentially provides you with considerable scope to design a research project that capitalises on a wide range of available data sources. Many types of archival and documentary sources may be accessed online. Organisations' websites may provide access to certain types of documentary sources such as annual reports, company results, financial highlights, press releases and regulatory news. Media websites also provide facilities to search for articles about organisations and business and management topics (Saunders et al., 2019).

Thematic analysis searches for themes, or patterns, that occur across a data set (such as a series of interviews, observations, documents or websites being analysed). Thematic Analysis involves a researcher coding her or his qualitative data to identify themes or patterns for further analysis, related to his or her research question.

Template Analysis is is a type of Thematic Analysis, with a few key differences. In Thematic Analysis all data items (transcripts or other text) are coded first before the search for themes fully begins.

Explanation Building and Testing,

Grounded Theory is an emergent and systematic research strategy. It avoids using a priori codes (Section 13.6) derived from existing theory and commences inductively, by developing codes from the data. The development of an emergent idea or theory from these data informs the direction of a Grounded Theory study. Grounded Theory is seen as systematic, or even prescriptive, because it sets out a number of tenets or elements that should be followed. Grounded Theory is not as flexible as Thematic Analysis or Template Analysis.

Narrative Analysis is a collection of analytical approaches to analyse different aspects of narrative. These may be combined in practice, depending on your research question and purpose, and the nature of your data. Unlike Thematic Analysis, Template Analysis or Grounded Theory Method, where original data are fragmented by coding and then assigned to analytical categories, narrative data are preserved and analysed as a whole unit or narrative sequence.

'**Discourse Analysis'** is a term covering a variety of approaches that analyse the social effects of the use of language. In general terms 'discourse' refers to the spoken or written use of language, often referred to as talk or text. In Discourse Analysis, the emphasis is not on studying the way in which language is used for its own sake. Use of language is a key way in which people make sense of their social world. In this more specific sense, 'discourse' describes how language is used to shape this meaning-making process, to construct social reality. A discourse is therefore not just seen as neutrally reflecting social practice or relations but as constructing these (although the notion of 'constructing' is contentious and we return to it later). In this way, Discourse Analysis explores how discourses construct or constitute social reality and social relations through creating meanings and perceptions.

Content Analysis is an analytical technique that codes and categorises qualitative data in order to analyse them quantitatively. Content Analysis has a long history that illustrates its use as an approach spanning qualitative and quantitative methods. In some approaches to Content Analysis, analytical categories will be allowed to emerge during analysis, in a way that appears similar to Thematic Analysis discussed earlier, although the aim will still be to analyse data quantitatively and these categories will need to be explicitly reported to facilitate subsequent attempts to replicate the results.

Data condensation includes summarising and simplifying the data collected and/or selectively focusing on some parts of this data. **Data display** involves organising and assembling your data into summary diagrammatic or visual displays

Appendix 4: Interview questions ENG

Question	Sub question	intention	Expected answer
Theme: Demographics			
1. What industry do you work in?	1a. Ask for clarification if needed tor is mentioned	We want to compare the actual versus requirements as defined in chapter 3	1. Sector description 1a. Private sector or public sector
2. In what job role are you active in this sector?	2a. Can you describe what this role entails?		2. IT manager, architect, project manager, IT specialist, etc. 2a. Description of responsibilities.
3. How many years of experience do you have with information systems?	3a. How many years of experience do you have with blockchain systems?		3. X number of years 3a. X number of years
	3b. What experience do you have with a system? (support/ Business Case/ implementation/ hyper care)		3b. Wel/Niet/Alleen Theorie/Praktijk
	3c. How many blockchain system business cases have you done?		3c. X number of times
	3d. How many implementations of a blockchain system have you done?		3d. X number of times
Theme: Stakeholders			
4. What stakeholders does the organization have?	4a. What stakeholder analysis did you do?	Define all stakeholders of the organization to then see how many of these stakeholders are also relevant in a blockchain (based) system (to identify the intermediary)	4. organizational stakeholders 4a. (Intra)organization/ (Intra)department/business case level
	4b. How might stakeholders be relevant in a business case of a blockchain (based) system?		4c. A) B) C) …
5. Which of these stakeholders might fall away with a blockchain (based) system?	5a. What consequences do you expect if these intermediaries (stakeholders) are lost?	We want to find out if any stakeholders dropped out of a blockchain (based) system	5. List omitted stakeholders (intermediary) 5a. Consequence 1, Consequence2, etc.
	5b. What happens to these omitted stakeholders?		5b. Action1, Action2, etc.

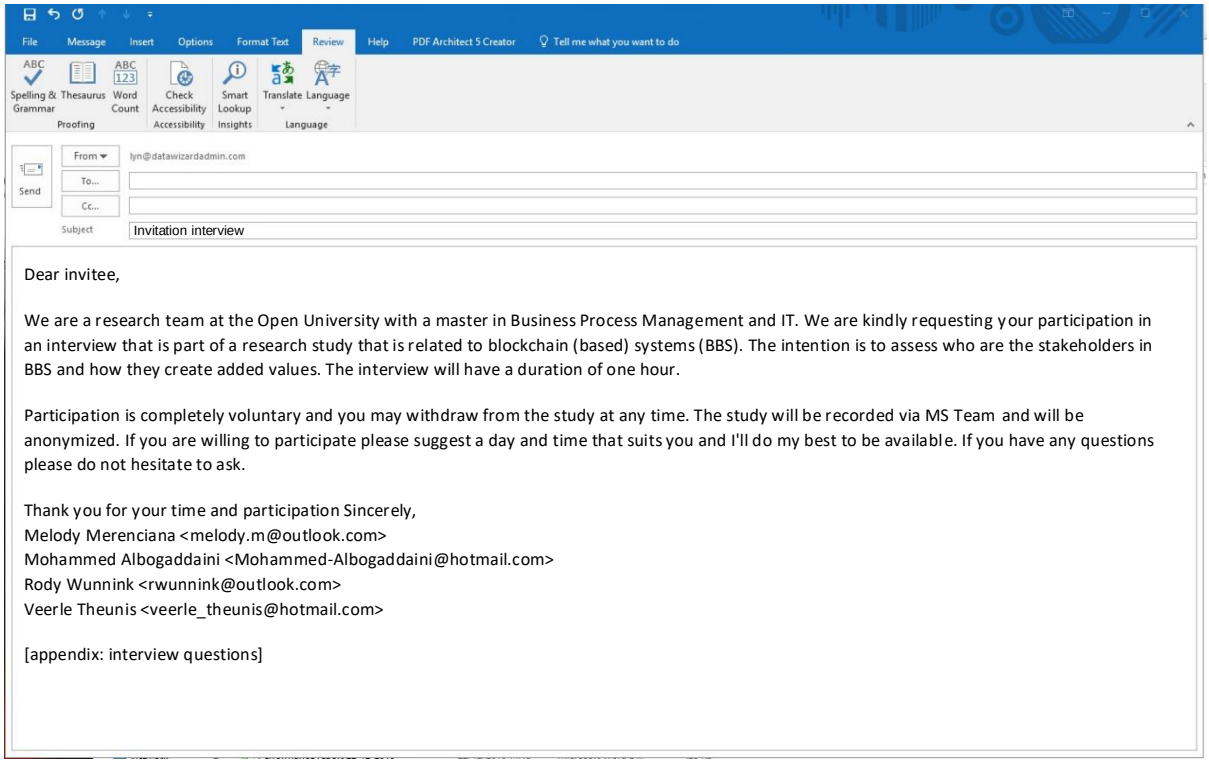
6. What stakeholders does the organization expect to involve in implementing a blockchain (based) system?	6a. What impact does the organization expect these new stakeholders may have?	We want to find out if any new stakeholders have joined a blockchain (based) system	6. List new stakeholders 6a. Consequence 1, Consequence2, etc.
	6b. Wat doen jullie met deze nieuwe stakeholders?		6b. Action1, Action2, etc.
Thema: added values			
7. What added values does a blockchain (based) system have?	7a. Can you indicate the importance of the added values?	Find out what added values a blockchain (based) system	7. security, transparency, user-friendliness, usefulness, Efficiency, immutability, etc 7a. We expect an explanation on the specified added values
8. What value added are important to which stakeholders?		The influence each stakeholder has (less influence = less value, greater influence = greater value)	8. Added value1 for stakeholder1 Etc.

Appendix 5: Interview questions NL

Vraag	Sub vraag	Intenties	Verwacht antwoord
Thema: Demografisch			
1. In welke sector bent u werkzaam?	1a. Vraag om toelichting als alleen de sector bij naam wordt genoemd	Toetsen werkelijk versus eisen zoals gedefinieerd in H3	1. Sector beschrijving 1a. Privaatsector of publieke sector
2. In welke functierol bent u actief in deze sector?	2a. Kunt u beschrijven wat deze rol inhoudt?		2. IT-manager, architect, project manager, IT specialist, etc. 2a. Beschrijving van de verantwoordelijkheden
3. Hoeveel jaren ervaring heeft u met informatie-systemen?	3a. Hoeveel jaar ervaring heeft u met blockchain systemen?		3. . X aantal jaren 3a. X aantal jaren
	3b. Welke ervaring heeft u met een systeem? (support/ Business Case/ implementeren/ hyper care)		3b. Wel/Niet/Alleen Theorie/Praktijk
	3c. Hoeveel business cases van een blockchain systeem heeft u gedaan?		3c. X aantal keer
	3d. Hoeveel implementaties van een blockchain systeem heeft u gedaan?		3d. X aantal keer (0)
Thema: Stakeholders			
4. Welke betrokken stakeholders heeft de organisatie?	4a. Welke stakeholder analyse heeft u gedaan? (Organisatie & business caseniveau)	Alle stakeholders van de organisatie definiëren om daarna te kijken hoeveel van deze stakeholders ook relevant zijn bij een BBS (om ook zo de tussenpersoon te identificeren)	5. Organisatorische stakeholders 4a. (Intra)organisatie/ (Intra)afdeling/business case niveau
	4b. Hoe zouden de stakeholders relevant kunnen zijn bij een business case van een BBS?		4c. A) B) C) …
5. Welke van deze stakeholders zouden kunnen wegvallen bij een BBS?	5a. Welke gevolgen verwacht u als deze tussenpersonen (stakeholders) wegvallen?	We willen te weten komen of er stakeholders zijn weggevallen bij een BBS	5. Lijst weggevallen stakeholders (tussenpersoon) 5a. Gevolg 1, Gevolg2…
	5b. Wat gebeurt er met deze weggevallen stakeholders?		5b. Actie1, Actie2…

6. Welke stakeholders verwacht de organisatie te betrekken bij het toepassen van een BBS?	6a. Welke gevolgen verwacht de organisatie dat deze nieuwe stakeholders kunnen hebben?	We willen te weten komen of er nieuwe stakeholders zijn bijgekomen bij een BBS	6. Lijst nieuwe stakeholders/geen 6a. Geen/gevolg 1/gevolg 2...
	6b. Wat doen jullie met deze nieuwe stakeholders?		6b Geen/actie1, Actie2...
Thema: toegevoegde waarden			
7. Welke toegevoegde waarden heeft een BBS?	7a. Kunt u van de toegevoegde waarden aangeven wat het belang is?	Achterhalen welke toegevoegde waarden een BBS brengt	7. security, transparency, user-friendliness, usefulness, Efficiency, immutability, etc 7a. We verwachting een uitleg op de opgegeven toegevoegde waarden
8. Welke toegevoegde waarde zijn voor welke stakeholders belangrijk?		De invloed die elke stakeholder heeft (minder invloed = minder waarde, grotere invloed = grotere waarde)	8. TW1 voor S1 TW2 voor S1… TW1 voor S2 TW2 voor S2… TW1 voor S3 TW2 voor S3…

Appendix 6: Email invitation ENG



Subject: Invitation interview

Dear invitee,

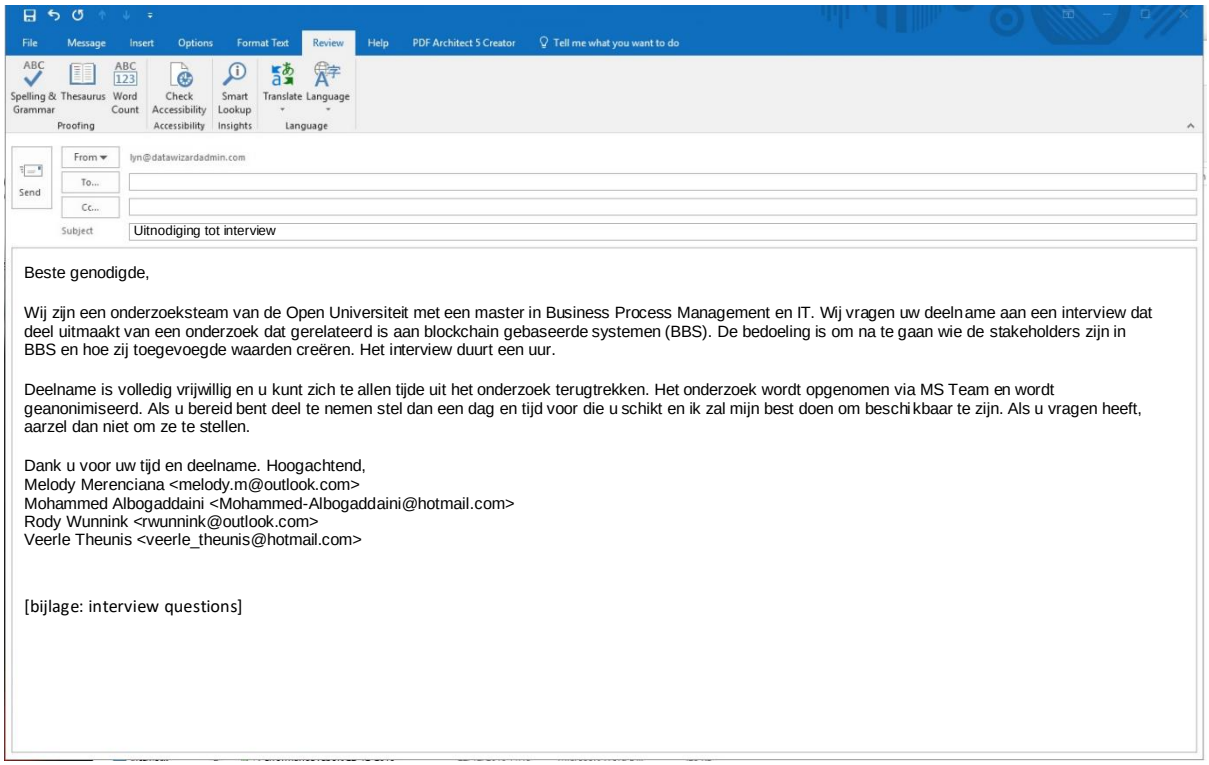
We are a research team at the Open University with a master in Business Process Management and IT. We are kindly requesting your participation in an interview that is part of a research study that is related to blockchain (based) systems (BBS). The intention is to assess who are the stakeholders in BBS and how they create added values. The interview will have a duration of one hour.

Participation is completely voluntary and you may withdraw from the study at any time. The study will be recorded via MS Team and will be anonymized. If you are willing to participate please suggest a day and time that suits you and I'll do my best to be available. If you have any questions please do not hesitate to ask.

Thank you for your time and participation Sincerely,
Melody Merenciana <melody.m@outlook.com>
Mohammed Albogaddaini <Mohammed-Albogaddaini@hotmail.com>
Rody Wunnink <rwunnink@outlook.com>
Veerle Theunis <veerle_theunis@hotmail.com>

[appendix: interview questions]

Appendix 7: Email invitation NL



Subject: Uitnodiging tot interview

Beste genodigde,

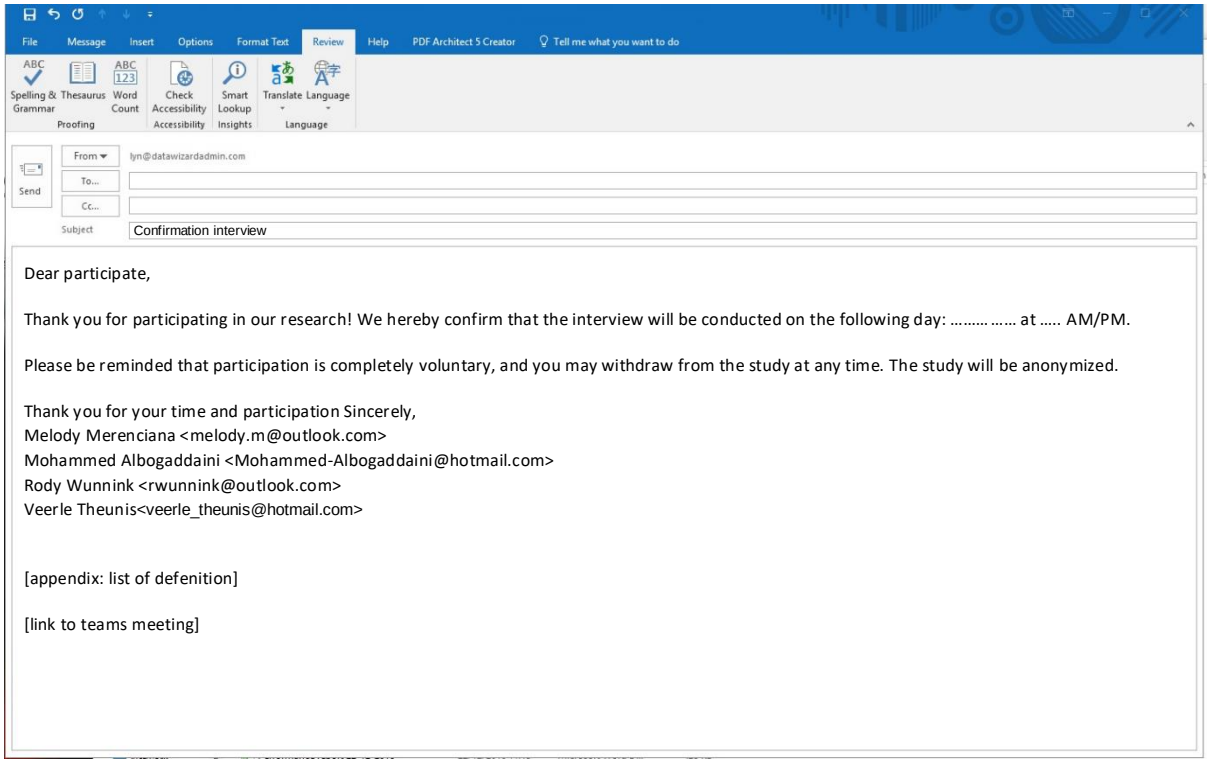
Wij zijn een onderzoeksteam van de Open Universiteit met een master in Business Process Management en IT. Wij vragen uw deelname aan een interview dat deel uitmaakt van een onderzoek dat gerelateerd is aan blockchain gebaseerde systemen (BBS). De bedoeling is om na te gaan wie de stakeholders zijn in BBS en hoe zij toegevoegde waarden creëren. Het interview duurt een uur.

Deelname is volledig vrijwillig en u kunt zich te allen tijde uit het onderzoek terugtrekken. Het onderzoek wordt opgenomen via MS Team en wordt geanonimiseerd. Als u bereid bent deel te nemen stel dan een dag en tijd voor die u schikt en ik zal mijn best doen om beschikbaar te zijn. Als u vragen heeft, aarzel dan niet om ze te stellen.

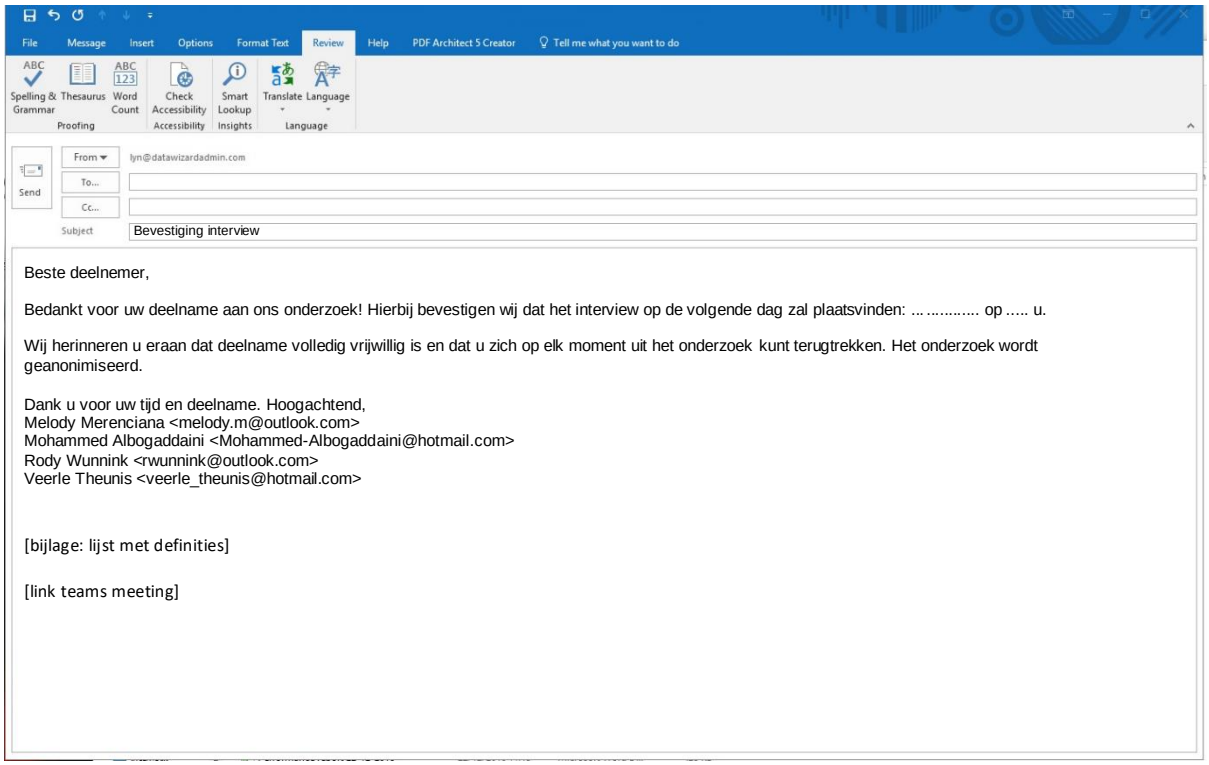
Dank u voor uw tijd en deelname. Hoogachtend,
Melody Merenciana <melody.m@outlook.com>
Mohammed Albogaddaini <Mohammed-Albogaddaini@hotmail.com>
Rody Wunnink <rwunnink@outlook.com>
Veerle Theunis <veerle_theunis@hotmail.com>

[bijlage: interview questions]

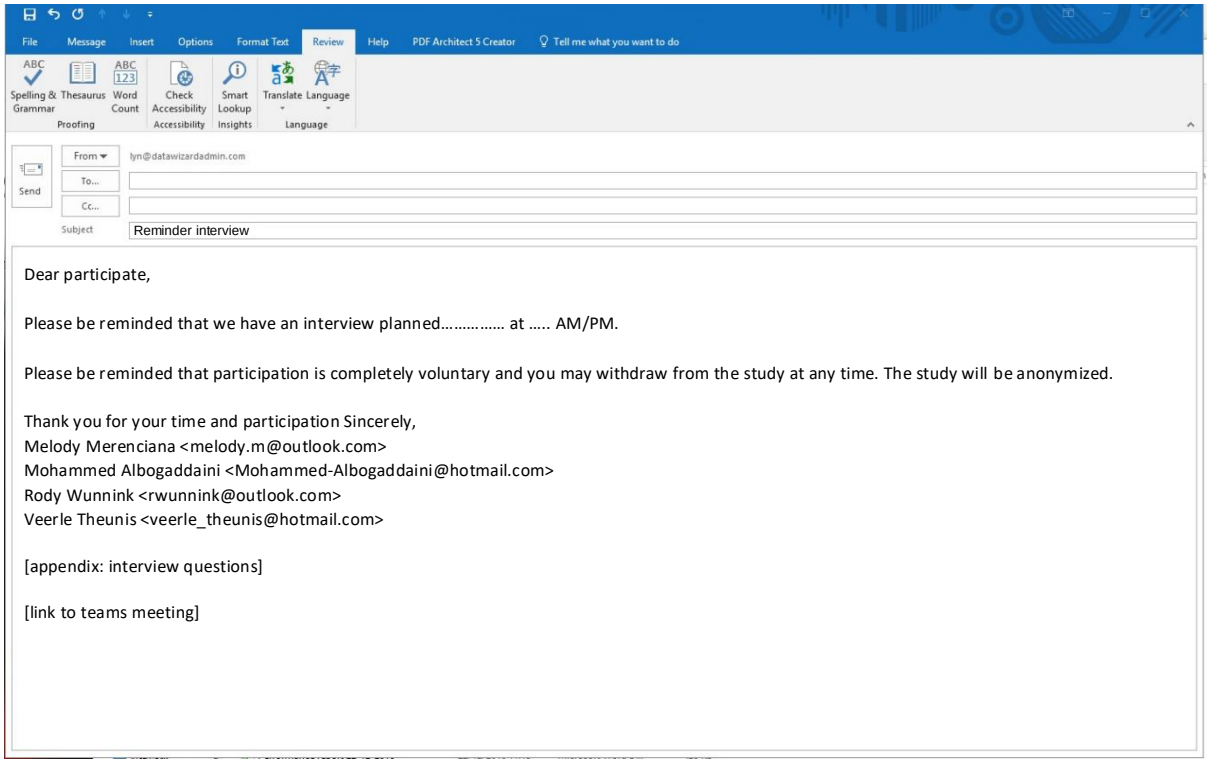
Appendix 8: Email confirmation ENG



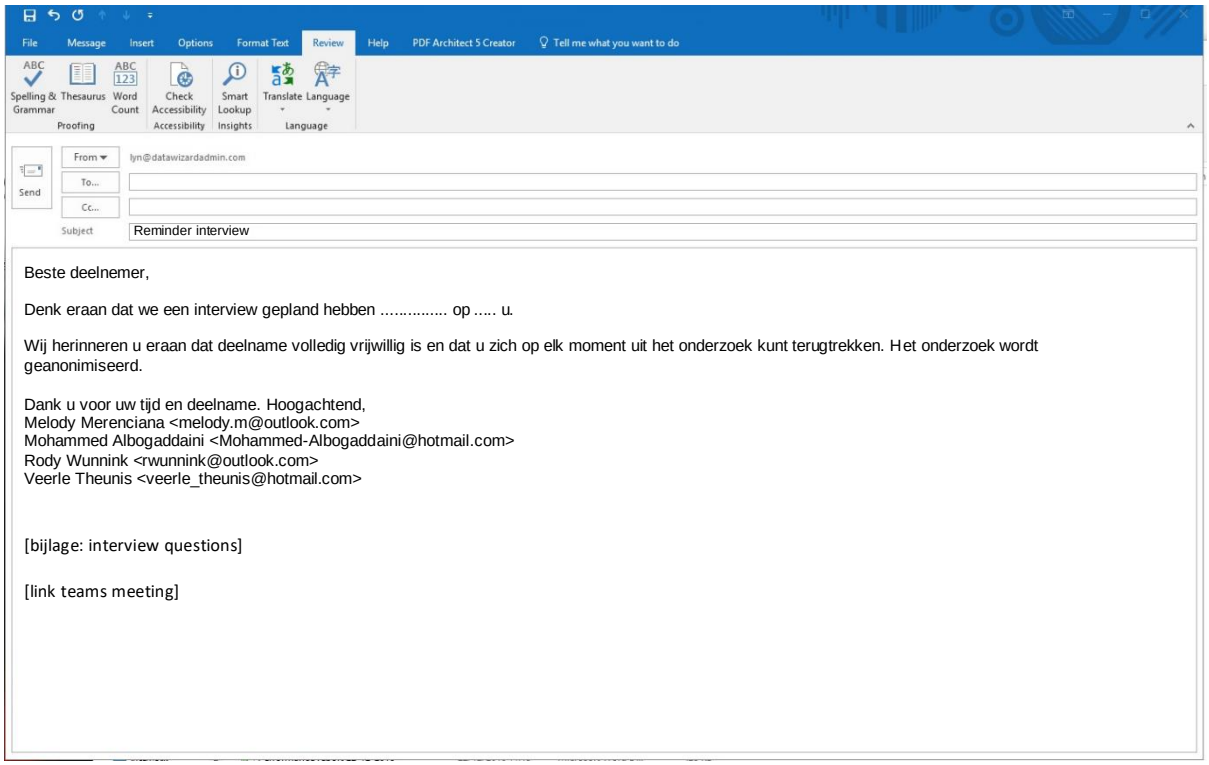
Appendix 9: Email confirmation NL



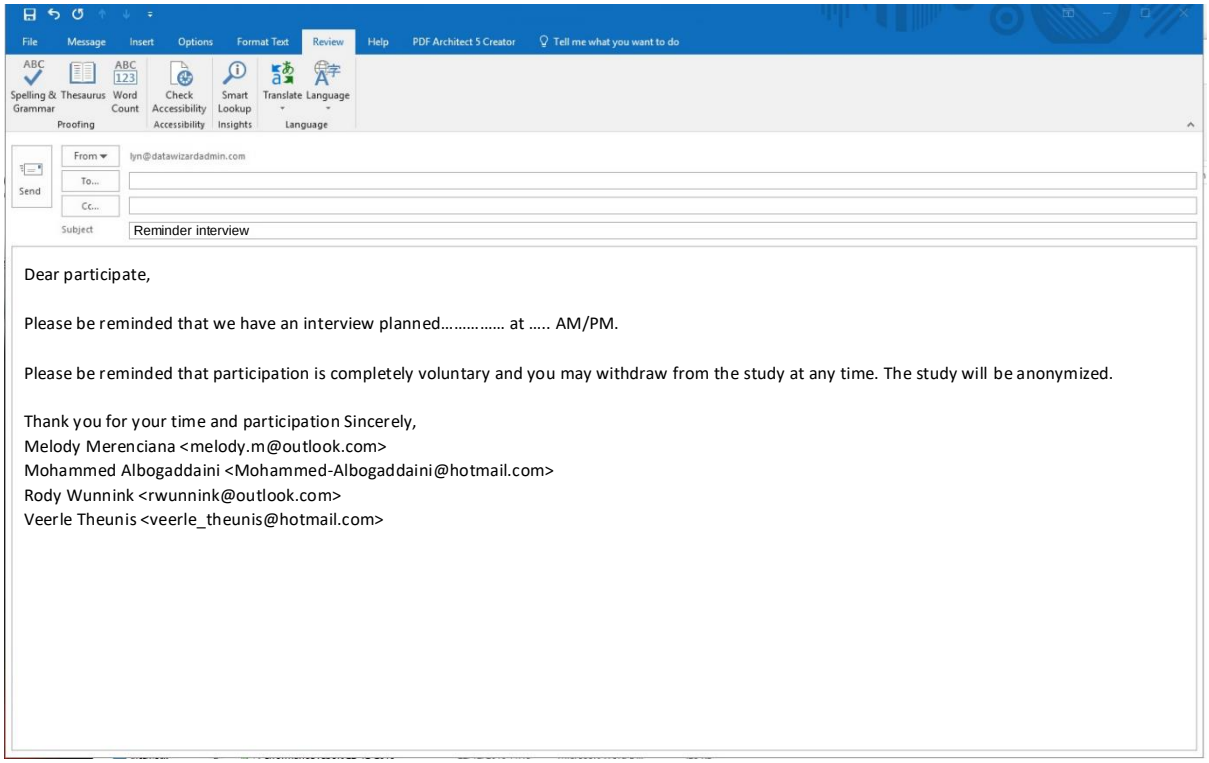
Appendix 10: Email reminder ENG



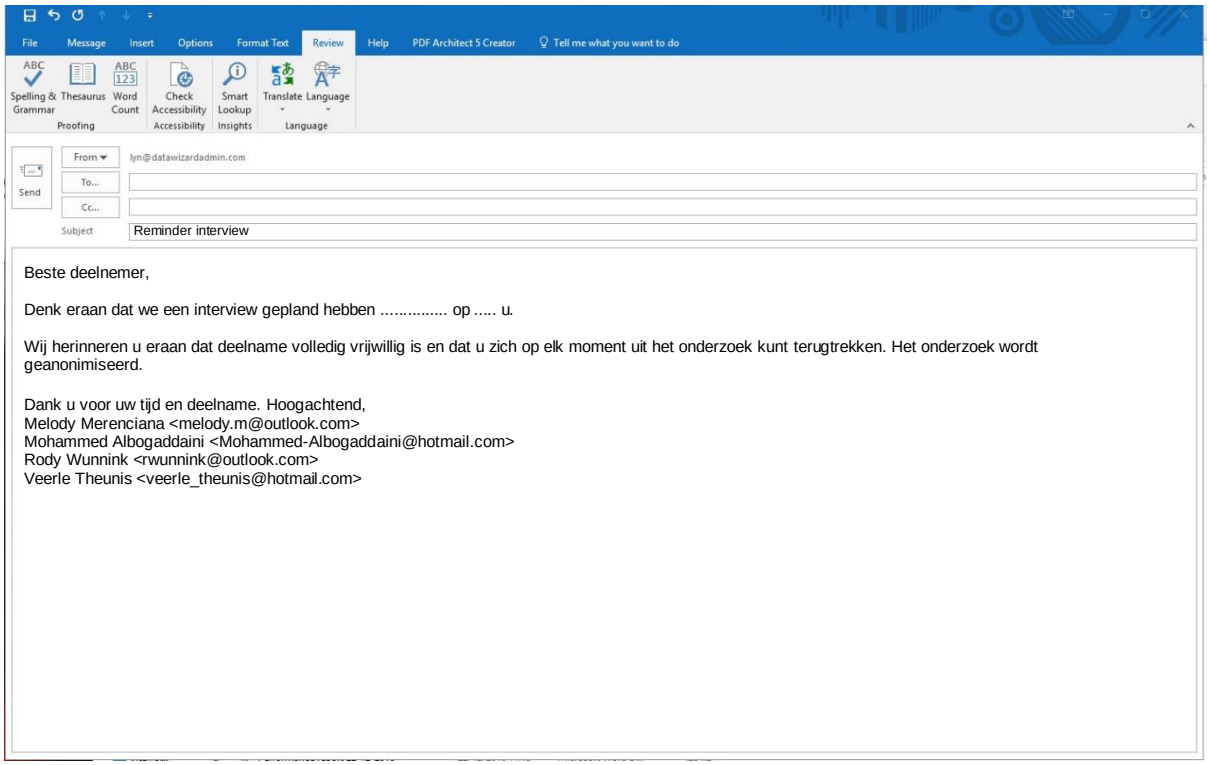
Appendix 11: Email reminder NL



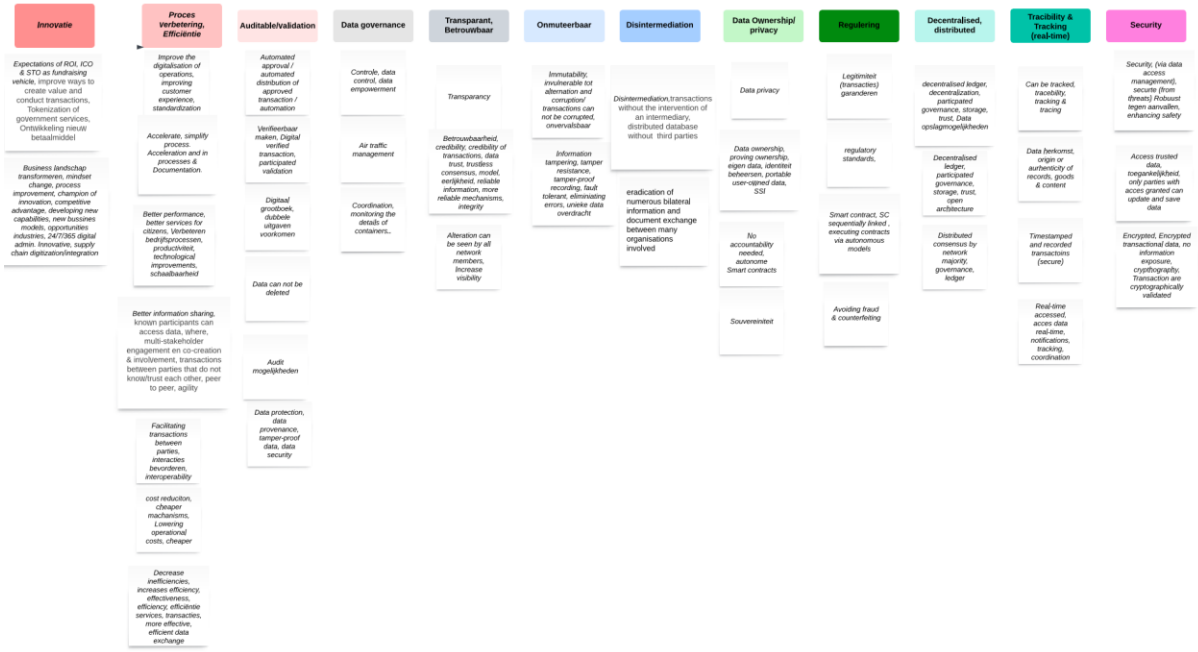
Appendix 12: Thank you email ENG



Appendix 13: Thank you email NL



Appendix 14: Miro board



Appendix 15: Stakeholder categories

Category Stakeholders	Definition	Stakes (in the business case)
1 external expert	An external person and/or organization who is consulted for their expertise to provide input for the business case for BBS (DLT)	The use of expertise as input and not be misused what can result in reputation damage. For the short term there will be financial benefits.
2 technology providers	Persons and/or organizations who provide hardware and software technology across the life cycle of BBS (DLT)	Technology providers earn money (revenue), accomplish good partnership (internal) and protect their reputation (external).
3 redundant intermediate	Persons and/or organizations (intermediaries) who currently functions as intermediate in the process and who are negative stakeholders and therefore have to be considered in the business case (become superfluous because their (commercial) activity is undermined by BBS)	Expected redundant intermediaries like to maintain their position within the current chain.
4 (malicious) attacker	Persons and/or organizations intending to compromise BBS (DLT)	The malicious attacker earns money, is working on reputation, and/or terrorism.
5 business stakeholders	Persons and/or organizations who are interested in profitability of the BBS and looking forward to integrate their added values in the business case of BBS (DLT)	The business stakeholder supports to set up and develop on strategic and tactical level the business case for BBS.
6 users	Persons and/or organizations who will add data and can control data at BBS (DLT)	Users who want to exchange data on a operational level user-friendly and manageable.
7 customers	Persons and/or organizations who are receiving products or services that are created or delivered in a reliable way by using BBS (DLT)	Customers prefer ease of use and a user-friendly and manageable BBS.
8 network management	Persons and/or organizations managing the system, that monitor the network and work together with other organizations in a chain where data are exchanged via BBS (DLT)	That the individual organization influences the construction, monitoring and maintenance of the network of BBS (DLT).
9 the society	The society who represent the interests of individuals and organizations operating in a certain industry using BBS (DLT)	The society wants a transparent process and a user-friendly BBS related to ethical, integrity and privacy issues (DLT).
10 regulators	Authorities responsible for making policy, writing standards and setting regulations along with enforcing them for BBS (DLT)	Regulators want respect of the rules related to BBS (DLT).

Appendix 16: Reflection validity, reliability , and ethical aspects

Validity in the literature search:

- Construct validity: The literature search conducted prior to the interviews helped identify relevant constructs to be measured. The interviews were designed to measure specific constructs related to the research questions, such as stakeholders' perceptions of the added value of blockchain (based) systems. The interview questions were reviewed by experts in the field to ensure that they accurately measured the constructs of interest.
- Internal validity: To ensure internal validity, the study team followed a systematic and transparent approach in conducting the literature search. This included defining clear criteria for study selection, using appropriate keywords and databases, and documenting the search process. The systematic approach enhanced the internal validity by minimizing potential bias and ensuring comprehensive coverage of relevant literature.
- External validity: The literature search aimed to include a wide range of sources from different contexts to enhance the external validity of the findings. By including studies conducted in various settings and populations, the research team aimed to increase the generalizability of the results.
- Ecological validity: The literature search considered studies that focused on real-world settings and actual experiences of stakeholders with blockchain (based) systems. This emphasis on ecological validity ensured that the literature review captured the practical implications and real-life relevance of the research topic.

Reliability in the literature search:

- Search strategy: A systematic approach was employed to conduct the literature search, including the use of appropriate keywords, databases, and inclusion/exclusion criteria. By following a predefined search strategy, the reliability and reproducibility of the literature search were increased.
- Quality assessment: The included literature was critically appraised for its quality and relevance to the research topic. This assessment helped ensure that only reliable and high-quality sources were considered, enhancing the reliability of the literature review process.

Ethical aspects in the literature search:

- Avoidance of plagiarism: The study team adhered to ethical standards by properly citing and referencing all sources used in the literature search. This ensures intellectual property rights are respected and avoids plagiarism.
- Transparent reporting: The study team accurately reported the sources used in the literature review, providing clear citations and references. This transparency promotes ethical practices in academic research.
- Acknowledgment of authors: Proper acknowledgment was given to the authors of the studies included in the literature review, recognizing their contributions and intellectual property rights.

Validity in the preparation of interviews:

- Researcher reflexivity: The study team engaged in reflexive practices to acknowledge and address their own biases and assumptions during the interview preparation. This self-

awareness helped enhance the validity of the interview process by minimizing potential researcher-induced biases.

- Expert input: Experts in the field were involved in the review and validation of the interview questions. Their input helped ensure that the questions effectively measured the constructs of interest and aligned with established theories or frameworks, thereby enhancing the construct validity of the interviews.
- Piloting and feedback: A pilot study was conducted to assess the clarity, relevance, and effectiveness of the interview questions. Feedback from participants in the pilot study provided insights into the comprehensibility and appropriateness of the questions, contributing to the overall validity of the interview process.

Reliability in the preparation of interviews:

- Interview guide development: The interview questions were carefully developed to ensure they effectively captured the research objectives and relevant constructs. A systematic approach, such as pilot testing, iterative refinement, and feedback from experts, was employed to enhance the reliability of the interview guide.
- Pre-testing of the interview process: A pre-test or pilot study was conducted with a small subset of participants to assess the clarity, coherence, and effectiveness of the interview process. This pre-testing phase allowed for the identification and resolution of any potential issues that could impact the reliability of subsequent interviews.

Ethical aspects in the preparation of interviews:

- Informed consent: Participants were provided with detailed information about the study's purpose, procedures, risks, and benefits. They were given the opportunity to ask questions and provide voluntary informed consent, ensuring ethical treatment of participants.
- Protection of participant rights: The study team ensured the confidentiality and anonymity of participants throughout the interview process. Participants' identities were protected, and their responses were treated with confidentiality and respect, promoting ethical standards of privacy and data protection.
- Ethical approval: The study obtained ethical approval from the relevant institutional review board or ethics committee, demonstrating compliance with ethical guidelines and regulations.

Validity in the interviews:

- Construct validity: The literature search conducted prior to the interviews helped identify relevant constructs to be measured. The interviews were designed to measure specific constructs related to the research questions, such as stakeholders' perceptions of the added value of blockchain (based) systems. The interview questions were reviewed by experts in the field to ensure that they accurately measured the constructs of interest.
- Internal validity: To ensure internal validity, the study team used a standardized interview protocol and asked all participants the same set of questions. The interviews were conducted using a reliable software platform, and the study team was trained in how to conduct interviews to minimize any potential biases.
- External validity: While the sample size of 16 interviews may not be large enough to generalize the findings to a larger population, the study team attempted to ensure external validity by selecting a diverse range of participants who had experience with blockchain

(based) systems. The findings may be transferable to other settings and populations with similar characteristics.

- Ecological validity: The interviews were conducted in a real-world setting, and the study team attempted to create an environment that was like the participants' usual work environment. The questions were designed to capture participants' actual experiences and perceptions of blockchain (based) systems, rather than hypothetical scenarios.

Reliability in the interviews:

- Interviewer consistency: The interviewers followed a standardized procedure while conducting the interviews, using the same set of questions for all participants. This consistency enhanced the reliability of the interview results.
- Interviewee consistency: The interview questions were clear and unambiguous, allowing participants to provide consistent and reliable responses.

Ethical aspects in the interviews:

- Informed consent: Participants provided voluntary informed consent before participating in the interviews, ensuring their autonomy and understanding of the research process.
- Confidentiality and anonymity: Participants' identities and responses were kept confidential and anonymized, protecting their privacy and promoting ethical data handling.
- Respect for participants: Participants were treated with respect throughout the interview process, and their experiences and perspectives were valued. The research team avoided exploitation or harm to participants.
- Fairness: The research team must ensure that all participants are treated fairly and that their voices are heard equally.
- Debriefing: Participants are given an opportunity to discuss their experience after the interview and to ask any questions they may have.
- Cultural sensitivity: The research team should be aware of and respect cultural differences that may impact the research process and participants' responses.

Validity in data analysis:

- Triangulation: Multiple data sources, were used for analysis to enhance the validity of the findings. Triangulation helps ensure that the results are consistent and not solely reliant on one source of data.
- Consistent coding: The coding process was conducted in a consistent and systematic manner, following predefined coding schemes or frameworks. This approach increases the validity of the analysis by ensuring that similar data points are consistently classified and interpreted across different coders or analysts.
- Peer debriefing: The research team engaged in peer debriefing sessions, where multiple researchers discussed and reviewed the coding and analysis process. This collaborative approach helped enhance the validity of the interpretation by reducing individual biases and promoting critical reflection.

Reliability in data analysis:

- Inter-coder reliability: Multiple coders or analysts independently coded a subset of the data, and their results were compared to assess inter-coder reliability. This process ensures consistency in coding decisions and enhances the reliability of the analysis.

- Coding manual or guidelines: A coding manual or guidelines were developed and shared with the coders to ensure a standardized approach to coding. This documentation provides clear instructions and criteria for coding, improving the reliability of the analysis.
- Regular meetings and discussions: The research team held regular meetings and discussions to review and resolve any discrepancies or uncertainties in coding. This iterative process enhances

Ethical aspects in data analysis:

- Confidentiality and anonymity: The research team maintained the confidentiality and anonymity of participants' data during the analysis. Personal identifiers were removed or anonymized to protect participants' privacy and ensure ethical handling of data.
- Data storage and security: The research team implemented appropriate measures to securely store and protect the collected data. Access to the data was restricted to authorized individuals, and data storage followed ethical and legal guidelines to prevent unauthorized use or disclosure.
- Participant voice and representation: The research team strived to accurately represent participants' perspectives and experiences during the analysis. Quotes or excerpts from the data were appropriately cited and used to support the findings, respecting participants' contribution to the research.
- Reflexivity and researcher positionality: The researchers were reflexive about their own biases, assumptions, and positions during the data analysis process. They acknowledged their influence on the interpretation of data and sought to minimize any potential biases that could affect the ethical integrity of the analysis.

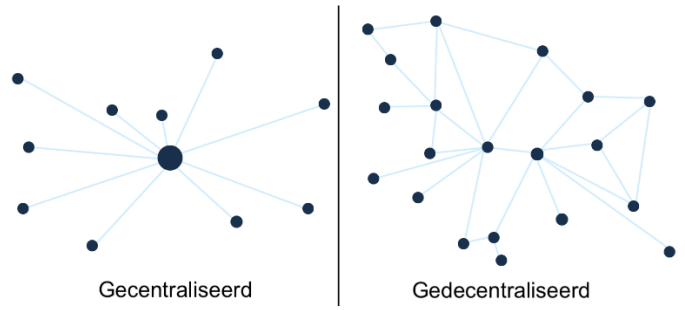
By incorporating these aspects of validity, reliability, and ethical considerations into the literature search, preparation of interviews, and the interview process, the research team ensured robust and ethically sound research practices.

BGS (Blockchain Gebaseerd Systeem)
Een systeem dat is gebaseerd op een decentraal netwerk waar transacties kunnen worden uitgevoerd en gebruik makend van een gedecentraliseerde database en een gedistribueerd open source-consensusprotocol in een peer-to-peer-netwerk dat crypto grafisch is beveiligd.

Business case
Een businesscase of een haalbaarheidsstudie wordt gebruikt om de afweging om een project te beginnen beschreven wordt. Vaak wordt aan de hand van de businesscase besloten om wel of niet te starten en/of verder te gaan met een project.

Gedecentraliseerd/Gedistribueerd
Gedecentraliseerd in blockchain betekent dat er geen centrale controle is en dat transacties worden geverifieerd en opgeslagen op een gedistribueerd netwerk van computers.

Gedistribueerd betekent dat er meerdere kopieën van de blockchain bestaan die worden gedeeld tussen de computers in het netwerk. We spreken van een gedecentraliseerd netwerk als een werklading wordt gedistribueerd over meerdere machines in plaats van op één centrale server.



Stakeholders
Een belanghebbende is elke groep of persoon, binnen of buiten de organisatie, die invloed kan hebben op of wordt beïnvloed door het bereiken van de doelstellingen van de organisatie.

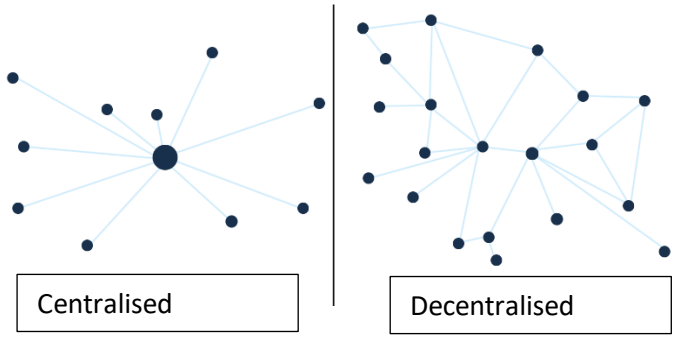
Toegevoegde waarden
Toegevoegde waarden kan zowel kwantitatief (als valuta, goederen etc)als kwalitatief ‘’Waarde wordt beschouwd als een eigenschap van iets, welke wordt gezien als meer wenselijk, nuttig, waardevol, belangrijk, enz.’

BBS (Blockchain Based System)
A system based on a decentralized network where transactions can be performed and using a decentralized database and a distributed open-source consensus protocol in a peer-to-peer network that is cryptographically secured.

Business case
A business case or feasibility study is used to describe the consideration to start a project. Often the business case is used to decide whether or not to start and/or proceed with a project.

Decentralized/Distributed
Decentralized in blockchain means there is no central control and transactions are verified and stored on a distributed network of computers.

Distributed means that there are multiple copies of the blockchain that are shared among the computers in the network. We speak of a decentralized network when a workload is distributed across multiple machines rather than on one central server.



Stakeholders
A stakeholder is any group or person, inside or outside the organization, that can affect or is affected by the achievement of the organization's objectives.

Added Values
Added value can be either quantitative (as currency, goods etc) or qualitative ''Value is considered a property of something, which is seen as more desirable, useful, valuable, important, etc

Attacker (malicious)	
	Competitor
	Competitor
	Facebook
	Instagram
Business stakeholders	
	Shareholders
	accountancy
	Action
	Departments looking at security issues
	Amazon
	other organization/client
	other parties
	other parties in the chain
	others
	application owner
	Asset Management departments
	autonomous organization
	Company
	Company in the Netherlands
	companies
	Critical infrastructure managers
	Tax Office
	Policy departments
	Decision makers
	Board of Chamber of Commerce
	Directors of those organizations
	Stock exchange
	builders
	Business
	CTO
	the first party
	the market
	participating parties
	Management
	this kind of organization
	Divisions
	domains
	Shareholders
	accountancy
	Action
	Departments looking at security issues
	Amazon
	other organization/client
	other parties
	other parties in the chain

others
application owner
Asset Management departments
autonomous organization
Company
Company in the Netherlands
companies
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Critical infrastructure managers
Tax Office
Policy departments
Decision makers
Board of Chamber of Commerce
Directors of those organizations
Stock exchange
builders
Business

	CTO
	the first party
	the market
	participating parties
The society	
	Other people in the ecosystem
	Other region
	Chinese community
	whole world
	Ecosystem
	Every country in the world
	Large mass
	Everyone
	Everyone in the world
	society
	Market
	Man
	People
	People around the world
	People from Cambodia
	People from places where there is oppression
	new world
	Public transportation
	Older people
	Public perception
	Travelers
	Social network
	Social media
	Social World
	System
	Many people
External expert	
	Advisor
	Analysts from other parties
	other people
	Architect
	Asset managers
	Blockchain coalition
	bol.com
	Builder
	Builders
	Fellow Grid Managers
	Consultant
	The creator of the website
	The question makers
	Developer
	Developers Serey
	Developers of Heart at Finance

	Developers Wallet 79
	Dutch Blockchain Coalition
	a third party
	Energy Web Foundation
	Engineers
	External (maintenance) parties
	External auditor
	external parties
	fiscal advisor
	Legal specialists
	KVK
	logistical service providers
	people who convert processes
	People. Or ChatGPT
	Dutch data protection officer
	new busi
	Advisor
	Analysts from other parties
	other people
	Architect
	Asset managers
	Blockchain coalition
	bol.com
	Builder
	Builders
	Fellow Grid Managers
	Consultant
Users	
	100 Owners
	3 people
	actors
	administrative staff
	advertiser
	lawyer
	lawyer of the suspect
	All parties involved
	other parties
	Other pension providers
	Company
	Both parties
	certain people
	certain parties
	salvage company
	people involved
	BOA
	Farmer
	Citizen
	Business Unit

Chaffeurs
Chauffeur
drivers
club of people
coach
coaches
Consultant
Content creators
creator
student
car buyer
dealer
participating party
a party
simple carrier
Own company
Own group of users
Own organization
Owner
End users
enthusiastic employees
enthusiasts
factory
garage
user
Users
Lender
hacketon
Enforcers
Whole organization
Colleges
Someone
Someone who educates
Someone seeking education
Someone who wants to borrow money
Someone seeking employment
information service provider
boys and girls
manager
supplier
Reader
logistics service provider
manager
employee
employees
More parties
People posting
People on the corner

fewer people
New pension fund
New employer
Subcontractors
Education
educator
educators
Training Company
training companies
training coordinator
Organization
Old pension provider
private company
Party
Parties accepting Bitcoin
Parties receiving goods
Parties arranging transportation
PC users
Pension fund
Pension administrator
Pension providers
poc-group
Writer
Writers
Specific users
Student
Super user
trainer
trainers
transport
Transport company
Transport company
Usual suspects
Landlords
point of sale
Carrier
Carrier who scanned cars
Carrier
next party
Truck driver
fleet
Employer
Employer
employers
Job seeker

Customers

Customers
graduate student

	Other organization/customer - collaborative party
	Consumers
	student
	trainees
	Early adaptors
	Early adopters
	guests
	Tenants
	customer
	Customers
	Customer base
	Potential customers
	Students
	Stage actors
Network management	
	ABN amro
	Other companies
	Other businesses in the hand of action
	Other businesses
	other party
	other parties
	Other parties in the chain
	Other types of chain
	Business
	companies
	Staffing companies
	Industry
	Industry organization
	Business to Business
	Business to Business
	Business to consumer
	Business units
	the market
	dominant party
	a whole chain
	A whole chain of participants
	Own network
	Own networks
	Electorate Blockchain
	Family businesses
	Larger parties
	Whole chain
	Whole chain with many parties
	individual organizations
	investors
	Chain
	chain pa
	ABN amro

	Other companies
	Other businesses in the hand of action
	Other businesses
	other party
	other parties
	Other parties in the chain
	Other types of chain
	Business
	companies
	Staffing companies
	Industry
	Industry organization
	Business to Business
	Business to Business
	Business to consumer
	Business units
	the market
	dominant party
	a whole chain
	A whole chain of participants
	Own network
	Own networks
	Electorate Blockchain
	Family businesses
Redundant intermediator	
	Bank
	Banks
	Banks that provide guarantees
	Banks in Cambodia
	Tax Office
	Building Fund
	Cental Bank
	Central Bank
	Central Bank of Cambodia
	Financial accountant
	Financial institutions
	Fund
	Lender
	Lenders
	Investor
	Legal advisor
	lawyer
	People who have money and want to invest
	Network of people in the financial world
	New middellman
	Notary
	Our banks and payment networks
	Billing parties

	Pay Service provider (bank)
	Intermediary party
	Intermediary providing interest
	Intermediary parties
	Intermediaries such as banks
	Publishers
	Publisher
	Insurer
	Insurers
Regulators	
	Definite system
	Cambodia
	the law
	Europe
	Municipalities
	Institute in the Netherlands
	Nation-state
	Netherlands
	Dutch state
	Governments
	Government
	Province
	Spain
	Stateless Network States
	Regulators
	legislation
	Laws in Germany
	Caregiving state
Technology providers	
	construction supplier
	central server
	a database
	supplier
	Suppliers

Aanvaller (malicious)	
	Concurrent
	concurrentie
	Facebook
	Instagram
Business stakeholders	
	Aandeelhouders
	accountancy
	Action
	Afdelingen die kijken naar veiligheidsaspecten
	Amazon
	andere organisatie/opdrachtgever
	andere partijen
	andere partijen in de keten
	anderen
	applicatie eigenaar
	Asset Management afdelingen
	autonome organisatie
	Bedrijf
	Bedrijf in Nederland
	bedrijven
	Beheerders van kritieke infrastructuur
	Belastingdienst
	Beleidsafdelingen
	beslissers
	Bestuur van Kvk
	bestuurders van die organisaties
	Beurs
	bouwers
	Business
	CTO
	de eerste partij
	de markt
	deelnemende partijen
	Directie
	dit soort organisaties
	Divisies
	domeinen waar auto's terecht komen
	dominant in de keten
	Dutch Blockchain Coalition
	Finance afdeling
	Financiën
	Foundation
	Gemeenten
	Google
	Grote bedrijven

grote organisaties
grotere organisatie
Handelaar
Heart at Finance
hoger management
Hogeschool
HR-manager
HR-managers
HSQ (veiligheid, gezondheid, milieu, kwaliteit) afdelingen
HSQ afdeling
huilende derde
instanties
intermediair
Internal Audit afdeling
investeerders
Investeringspartijen
IT afdelingen
IT mensen
IT staffing bedrijf
IT werknemers
jurist
Kamer van Koophandel
keten binnen het strafrecht
Kleine en middelgrote bedrijven
KVK innovatielab
Loyalty bedrijf
Manager
meewerkende partij
Netbeheerder
Neutrale partij die iedereen vertrouwt
NFI
OM
Ondernemers
Opdrachtgever
Opleidingsbedrijf
opleidingsbureau
overbodige partijen
partijen om tafel
Partijen waar jij samenwerking mee hebt
Philips
poc-groep
politie
Stakeholder
stakeholder investeerders
Stakeholders
Subsidiepartijen
techneut
tussen de partijen

	type bedrijf
	verdachte
	verschillende partijen
	Werkgever
De samenleving	
	Andere mensen in het ecosysteem
	Andere regio
	Chinese community
	de hele wereld
	Ecosysteem
	Elk land ter wereld
	Grote massa
	Iedereen
	Iedereen op de wereld
	maatschappij
	Markt
	Mens
	Mensen
	Mensen over de hele wereld
	Mensen uit Cambodja
	Mensen uit plaatsen war onderdrukking is
	nieuwe wereld
	Openbaar vervoer
	Oudere mensen
	Publieke perceptie
	Reizigers
	Sociaal netwerk
	Social media
	Social World
	Systeem
	Veel mensen
Externe expert	
	Adviseur
	Analisten van andere partijen
	andere mensen
	Architect
	Asset managers
	Blockchain coalitie
	bol.com
	Bouwende partij
	bouwers
	Collega Netbeheerders
	Consultant
	De maker van de website
	de vragen makers
	Developer
	Developers Serey
	Developers van Heart at Finance

Developers Wallet 79
Dutch Blockchain Coalition
een derde partij
Energy Web Foundation
Engineers
Externe (onderhouds) partijen
Externe accountant
externe partijen
fiscaal adviseur
Juridische specialisten
KVK
logistieke dienstverleners
mensen die processen omzetten
Mensen. Of ChatGPT
Nederlandse Functionaris gegevens bescherming
nieuwe business
Partijen
Privacy
Privacy officer
Security
Security officer
Smarties
Technische mensen
Twee schrijvers
Uitvoerders
Ux-designer
Weconomics

Gebruikers

100 Eigenaren
3 personen
acteurs
administratief personeel
adverteerder
advocaat
advocaat van de verdachte
Alle betrokkenen
andere partijen
Andere pensioenuitvoerders
Bedrijf
Beide partijen
bepaalde mensen
bepaalde partijen
bergingsbedrijf
betrokkenen
BOA
Boer
Burger
Business Unit

Chaffeurs
Chauffeur
chauffeurs
clubje van mensen
coach
coaches
Consultant
Content creators
creator
cursist
de autokopende partij
dealer
deelnemende partij
een partij
eenvoudige vervoerder
Eigen bedrijf
Eigen groepje gebruikers
Eigen organisatie
Eigenaar
Eindgebruikers
enthousiaste medewerkers
enthousiastelingen
fabriek
garage
gebruiker
Gebruikers
Geldverstrekker
hacketon
Handhavers
Hele organisatie
Hogescholen
Iemand
Iemand die educatie geeft
Iemand die educatie zoekt
Iemand die geld wil lenen
Iemand die werk zoekt
informatiedienstverlener
jongens en meisjes
leidinggevende
leverancier
Lezer
logistiek dienstverlener
Manager
medewerker
medewerkers
Meer partijen
Mensen die een post plaatsen
Mensen op de hoek

minder mensen
Nieuwe pensioenfonds
Nieuwe werkgever
Onderaannemers
Onderwijs
opleider
opleiders
Opleidingsbedrijf
opleidingsbedrijven
opleidingscoördinator
Organisatie
Oude pensioenuitvoerder
particulier bedrijf
Partij
Partijen die Bitcoin accepteren
partijen die goederen ontvangen
Partijen die transporten regelen
PC users
Pensioenfonds
Pensioenuitvoerder
Pensioenuitvoerders
poc-groep
Schrijver
Schrijvers
Specifieke users
Student
Super user
trainer
trainers
transport
Transportbedrijf
Transporteur
Usual suspects
Verhuurders
verkooppunt
Vervoeder
vervoeder die auto's scande
Vervoerder
volgende partij
Vrachtwagenchauffeur
wagenpark
Wergever
Werkgever
werkgevers
Werkzoeker

Klanten

Afnemers
afstudeerder

andere organisatie/klant - samenwerkingspartij
Consumenten
cursist
cursisten
Early adaptors
Early adopters
gasten
Huurders
klant
Klanten
Klantenkring
Potentiële klanten
Studenten
Toneelspelers

Netwerk management

ABN amro
Andere bedrijven
Andere bedrijven in de hand van action
Andere businesses
andere partij
andere partijen
andere partijen in de keten
andere soorten ketenen
Bedrijf
bedrijven
Bedrijven uit de staffingwereld
Branche
Branche organisatie
Business to business
Business to Bussiness
Business to consumer
Business units
de markt
dominante partij
een hele keten
Een hele keten aan deelnemers
Eigen netwerk
Eigen netwerken
Electoraat Blockchain
Familiebedrijven
Grotere partijen
Hele keten
hele keten met veel partijen
individuele organisaties
investeerders
Keten
keten partijen
ketenpartijen

	Ketens
	Kleintje (partij)
	Kleintjes (partijen)
	Managementlaag
	manager bij een grote bank
	meerdere partijen
	Mensen die geloven in het belang
	netwerk
	Organisaties
	Partij
	Partijen
	Partijen die nieuwe klantenkring aanboren
	Partijen in supply chain management
	partijen met raamcontracten
	partner
	patner
	Rabobank
	samenwerkende ketenpartijen
	Samenwerkingen
	Social media
	Sociale netwerken
	Supply chain keten
	Transportbedrijven
	veel partijen
Redundant intermediator	
	Bank
	Banken
	Banken die garanties geven
	Banken in Cambodja
	Belastingdienst
	Bouwfonds
	Cental Bank
	Centrale bank
	Centrale bank van Cambodja
	Financial accountant
	Financiële instellingen
	Fonds
	Geldverstrekker
	Geldverstrekkers
	Investeerder
	Juridisch adviseur
	jurist
	Mensen die geld hebben en willen beleggen
	Netwerk van mensen in de financiële wereld
	Nieuwe middellman
	Notaris
	onze banken en betaalnetwerken
	Partijen die factuur opstellen

	Pay Service provider (bank)
	Tussen partij
	Tussenpartij die rente verschaft
	Tussenpartijen
	Tussenpartijen als banken
	Uigeverijen
	Uitgeverij
	verzekeraar
	Verzekeraars
Regelgevers	
	Bepaald systeem
	Cambodja
	de wet
	Europa
	Gemeenten
	Instituut in Nederland
	Natiestaat
	Nederland
	Nederlandse staat
	Overheden
	overheid
	Provincie
	Spanje
	Staatloos Netwerkstaten
	Toezichthouders
	wetgeving
	Wetten in Duitsland
	Zorgverlenende staat
Technologische providers	
	bouw leverancier
	centrale server
	een database
	leverancier
	Leveranciers

The interviews noted the presence of competitors as potential malicious players in the **attacker** (malicious) stakeholder category. Particularly, dangers from rivals like Facebook and Instagram were mentioned. The interviews revealed worries that these rivals would commit crimes or take advantage of weaknesses for their own gain. Although more information was not supplied, it appears that participants expressed worries about prospective rival companies' actions, particularly those of well-known social media platforms like Facebook and Instagram, in the context of the subjects that were discussed.

Various stakeholders participating in the business context were stated in the interviews under the category of **business stakeholders**. Participants in the chain, application owners, autonomous organizations, asset management departments, critical infrastructure managers, the Tax Office, policy departments, decision-makers, the Board of the Chamber of Commerce, directors of organizations, the stock exchange, builders, the CTO, management, and departments responsible for security issues are among these stakeholders. These stakeholders represent a wide range of organizations with a stake in the success of the under discussion issues as well as their commercial operations, security, and governance.

The interviews revealed a wide range of stakeholders from various social perspectives under the category of **society**. These stakeholders include other members of the ecosystem, people from various nations and regions (such as the Chinese community, people from Cambodia, and people who live in oppressive countries), the entire world's population, society as a whole, the market, men, people from various walks of life, travelers, users of public transportation, senior citizens, the social network, social media platforms, the social world, and the system. These stakeholders represent the wide range of people and organizations that are a part of the larger societal context, have an impact on, or are interested in, the topics under discussion.

The interviews revealed a range of individuals and organizations that offer expertise and direction from outside sources under the category of **external experts** stakeholders. The Dutch Blockchain Coalition, third-party developers, engineers, external maintenance parties, external auditors, fiscal advisors, legal specialists, the Chamber of Commerce (KVK), logistical experts, builders, consultants, asset managers, members of blockchain coalitions, people from organizations like bol.com, developers from various projects (such as Serey, Heart at Finance, and Wallet 79), third-party developers, architects, asset managers, members of the blockchain community, individuals from organizations like bol.com, builders, consultants, developers These outside specialists add their expertise, perceptions, and specialized abilities to the topics being discussed and give the ecosystem beneficial input.

The interviews revealed a wide spectrum of people and organizations that use or interact with the system under discussion as **user** stakeholders.. These stakeholders include owners, actors, administrative staff, advertisers, lawyers, both parties involved, other parties, pension providers, companies, certain people, salvage companies, BOAs (Board of Agriculture), farmers, citizens, business units, chauffeurs, drivers, coaches, consultants, content creators, students, car buyers, dealers, participating parties, carriers, organizations, end users, enthusiastic employees, enthusiasts, factories, garages, lenders, hackers, enforcers, colleges, information service providers, managers, suppliers, readers, logistics service providers, employees, people posting, people on the corner, new pension funds, new employers, subcontractors, educators, training companies, training coordinators, old pension providers, private companies, parties accepting Bitcoin, parties receiving goods, parties arranging transportation, PC users, pension funds, pension administrators, pension

providers, writers, specific users, super users, trainers, transport companies, usual suspects, landlords, points of sale, carriers who scan cars, truck drivers, fleets, employers, job seekers, and many more. These stakeholders represent the diverse user base and ecosystem that interacts with the discussed systems, bringing their unique perspectives, needs, and contributions.

The interviews revealed a range of stakeholders who are consumers or interact with the systems under discussion as customers in the category of **customers**. Customers themselves, graduate students, other businesses/clients (collaborative partners), consumers, students, trainees, early adopters, guests, tenants, the clientele, future clients, and performers on the stage are some of these stakeholders. These stakeholders are the people or organizations with a direct stake in the goods, services, or experiences offered by the systems under discussion. From a customer-centric perspective, their requirements, preferences, and feedback are vital in determining the creation, enhancement, and success of the systems.

The interviews identified numerous stakeholders involved in managing and using networks under the heading of **Nnetwork Management**. These stakeholders include ABN AMRO, additional businesses in the field of action, additional parties, additional parties in the chain, additional types of chains, business units, staffing firms, industry organizations, participants in business-to-business (B2B) and business-to-consumer (B2C) transactions, the market, dominant parties, an entire chain of participants, own networks, the Electorate Blockchain, family businesses, larger parties, individual organizations, investors, and more. These parties are the network's stakeholders because they are a part of it, actively participate in its management, or have a stake in its smooth operation. They cooperate, interact, and add to the network's governance, value production, and operations. For the network and its associated operations to be efficient, effective, and sustainable, their participation and coordination are essential.

The interviews with diverse players in regulatory monitoring and governance were highlighted under the category of **regulators**. Regulators, governmental organizations, nation-states, the Dutch state, municipalities, provinces, Spain, Europe, the Netherlands Institute, stateless network states, and caregiver states are some of these stakeholders. The interviews identified particular regulatory organizations or agencies, such as the Institute in the Netherlands, which may play a part in supplying direction, performing analysis, or creating regulatory recommendations in relation to blockchain technology.

The interviews revealed several stakeholders who normally serve as intermediates but may lose their relevance or importance in a blockchain (based) system, falling under the category of **redundant Intermediator**. Stakeholders in the financial industry include banks, banks that offer guarantees, banks in Cambodia, tax offices, building funds, central banks (such as the Central Bank of Cambodia), financial accountants, financial institutions, lenders, investors, legal counsel, lawyers, people looking to invest money, networks of people in the financial industry, new middlemen, notaries, banks and payment networks, billing parties, payment service providers (banks), intermediary parties, and intermedia These stakeholders typically help facilitate and manage business transactions, supply financial services, guarantee legal compliance, and provide trust and security across a range of industries. The decentralized and transparent nature of blockchain technology, however, eliminates the need for these middlemen in systems built on it because it can directly facilitate and confirm transactions, give transparency, and boost participant trust. The ecosystem's processes may become more effective, economical, and streamlined as a result of the redundancy of intermediaries.

The interviews mentioned many stakeholders involved in providing technological infrastructure and solutions under the stakeholder category for **technology providers**. Suppliers of construction materials, central servers, databases, and suppliers of general technology are some of these stakeholders.

Auditable & validation	
	looking back afterwards
	Audit trail write away
	Evidence arranged
	prove I've read it
	prove that you understand it
	prove you've read the book
	Blockchain questions verify
	business checks
	check question
	be able to perform checks
	that the book is understood
	data about the user
	Digital signature
	Digital information check
	a certain transaction happened
	Easily check
	prevent fraud
	Going m monitors
	Approval
	The book is read and understood
	Identify themselves
	Measurable
	make notification
	Measuring engagement
	abuse
	operational control information
	process controls
	registration
	Stimulus deliver product quality
	Temulent conditions is established
	verifiability of data
	verifiable data files
	What the sensor indicates
Data owernship & privacy	
	Only being able to access what is your part
	prove that the book is yours
	prove that the book is yours
	prove. I bought the book, the book is mine
	claim this book is yours
	Credit score without underlying data
	data privacy
	Own data
	Own data vault
	Own content generated
	Own network

	Own access, own story
	Own value
	Own content
	Owner of the person
	Owner of own content
	Owner of your content
	Ownership
	Guarantee owner own data
	grip
	claim the book
	You can say this book is mine
	Your identity
	Human/social capital
	Not ending up at Google or Amazon
	not capturing personal data
	transition ownership
	Privacy
	privacy is guaranteed
	Private messaging
	right to be forgotten
	Full control of own assets
	What is anonymous
	To show or not to show
Data governance	
	Become an image
	Forming an image
	consistently directing parties
	record something jointly
	centralize information
	information position
	interaction
	Environmental awareness on virus
	More environmentally conscious which type of blockchain
	New reality of all data
	Overarching meta value
	Sovereignty
Decentralisatie/gedistribueerd	
	Blockchain (Ethereum)
	Centers decentralized
	Data that is not on computers around the world
	Decentralized
	Making decentralized
	Decentralized system
	Decentralization
	decentralized
	decentralized approach
	decentralized organizing
	Distributed system

	Distributed storage
	Data shared
	It is public
	Anyone can use it
	Anyone can write on it
	Everyone logically managed
	Open data on chain
	Open ecosystem
	Public
	Public blockchain
	Public database
	server remains
	Social media platform
	Much more global
	Full decentralized application
	Stand-alone platform
Desintermediation	
	Alternative system without a third party
	Be able to remove certain parties from the chain
	Take out financial parties
	No barriers in between
	No intermediate parties
	limit interaction
	put people closer together
	Governments falling away
	Parties falling away
	Parties in between
	Remove links
	Replace intermediaries with Blockchain
	Remove intermediate parties
	Many links between the chain
	Different links do not have direct contact
	Eliminate third party
	Without a bank in between
Innovatie	
	read all
	Getting a different role
	differently
	Adapt business operations
	currency
	Business case
	Thinking business model
	Receive coins, make money
	Be able to use coins
	Receiving coins
	Credit scoring
	Sell data
	Digitization step

	disruptive if you don't keep up
	Own currency
	Making own tokens
	Make money
	Store in wallet
	innovation
	Innovative image
	Appear innovative
	met tokens are going to work
	new business model
	new business
	new angle
	generate unlimited different ids
	be able to see reaction to the book directly
	role of a party can change
	Blockchain coin
	coin get
	Sovern wallet
	Be able to start building applications on it
	Going to pay tokens
	Transform into a new investment
	transformed
	Earn from your content
Unmutable	
	Audit trail cannot be modified
	it stays like that
	Blockchain can never be modified
	Can actually assign identical ids to books
	That data is properly recorded and not modified
	Data is good
	Data cannot be deleted
	a unique QR code
	errors
	capture data on the blockchain
	Not deleting your messages
	prevent copying
	Not manipulated
	Not everyone can interview a copy
	No more of the blockchain
	Can no longer be changed
	Can no longer be changed
	Irrefutably
	Irrefutably recorded
	Expressed in ways that cannot be censored
	certain
	Ensure that the book becomes unique.
Proces improvements & efficiency	

Not having to visit as often
Making offers
Indicating ambitions
attractive data
Reduce administrative burden
Distances are great (also physically)
Everything is already funded everything is running, you don't need Venture Capital.
Alternative setup to get rid of bottlenecks
other work
Other shorter roles
other way available
store different place
Different working method than before
Organize differently
asset that adds value
Automatic can be handled
Automatically handle claims
Better content
Better reflecting
Better see how he is rewarded
Better rent
Better content
Better job finding
Better performance
Better price matching
Better return through the bank
happy with the model
like bol.com/intermediate out of business
earn more drivers
earn back coins
competitive advantage
Content only liked if it is good
create content
Calculate credit score
Settling thermae (paying/settling)
The Bitcoin Layer, there costs will soon be 0.0
Doing things that fit their own value
Things handled well
change things
Direct mee doing business with each other
Runs on your own phone
Dremel om bring low
easier
More efficient m tasks
More efficient process
More efficient process
Efficiency

Support each other
and very quickly
Arrange finance
Financial processing
Financial assets
Financial interests
Financial benefit
part of your money back
no administrative overhead
no administrative middleman
No need to send invoices
No friction on language and location
no filling out papers
no noise on the line
Getting money
Making money
Providing money
convenience increases
Related features
Better targeting
Good quality
Reward good performance
Good performance or not
Deliver good performance
Organize cheaply
save a lot of miles
Provide whole fleet information
Making work easier
How to express your own mind
high commitment
Hybrid system
Impact of study on job opportunities
Countering inefficiencies
sharing information
Store information digitally
Information available faster
Exchange information
erase information
information advantage
Intention a convenience has
interaction
save a lot of miles
made easy
Chance loan paid or not paid
Customer helped
Smaller chance of lender not getting money back
link to trade register
get a discount

Costs can be lower
Split costs
Costs vs Benefits
cost benefits
Build powerful things
Be able to match
Be able to work
qualitatively more complete
Nice platform for reader
Supplier helped
Easily scalable
Easier
Easier to delete data
Easier way suitable candidate by algorithm
Matching
Doing matching
Matching and algorithm
Make maximum money
more connection
Share more information about quality
More return on own money
More value coin
Bringing people together
Getting people to think about what they say
Helping people
Communicating with each other
need to do less
need fewer head offices
fewer people
less needed
Less frequent same information
less work
opportunities to exchange information
Network effect
Not a central computer is a bottleneck
Not manageable
Not as much paperwork anymore
new channels
Doing mutual settlement
Development plan
optimize channels
bringing parties together
Personal learning plan
Personal development plan for student
Personal information search
Practical problem solving
Change process of own company
optimize processes

	Improve product quality
	direct contact
	Achieve return
	Return on investment intention
	Change roles
	Change roles
	collaboration
	Collaborations between parties
	scan
	Creating scalable systems
	Sketch
	Scoring calculation
	self-service
	simple entry
	use smart-contract to have payments come through automatically
	speed
	Faster payment processing
	Faster path
	Proper purchase interviewing
	system replacement
	put time into other things
	transaction costs of Bitcoin are currently one of the cheapest
	Replacing vendors
	Much more efficient
	Much easier
	Much easier (no paper clutter)
	Much more information than that
	change
	simplified version
	Clarifying
	Provides ourselves interest
	Carrier doing well
	Guarantee continuation of existence
	Expected return
	process
	benefit shifting
	more advantageous
	Quite advanced
	wagons become fuller
	Work will be more easy
	We are going to support every
	Make themselves hybrid
Regulation	
	certain human rights
	Contracts
	And withdraw again
	Guarantee

	Good protocols
	At the moment punished
	New regulations
	Protocol
	Protocol has certain rules
	Protocol is implemented (via sensor)
	Manage protocol
	Do settlements
	Using smart contracts
	Support smart contracts
	Give permission
	Tokens needed to perform transactions
	To consensus on disputes
	According to agreements see bigger picture
	Laws properly applied
Security	
	Agree
	partially publicly accessible
	no data will be leaked
	You're the only one who can
	you can protect your data with encryption
	No one can see your data unless you give permission
	is not accessible
	Mission
	Privacy
	Privacy aspects
	Solving privacy risk
	security
	Security checks
	Document access
	Content access
	Safe
	data security
	To hide or not to hide
	What username behind certain publications
Traceerbaarheid en tracking	
	origin of certain raw materials
	all tracked
	everything on chain
	Automatic handling of damage
	Proving what happened to transactions
	Track
	Keeping track of all transactions
	document exchange
	pass on
	View a specific time
	Own Seed Trace
	any time

	revoke any time
	Track financial m resources
	origin
	origin of goods
	Every party can see exactly the transaction
	Exchange information
	Lifecycle tracking
	Record VOG metadata
	Register transfer moments
	QR code
	real-time
	Seat trace
	Settlements about transactions
	status of the car that
	lead back to the source
	Traceability of Assets legislation
	tracing
	Transaction capture
	Doing transactions
	Being able to track transactions
	transaction speed
	unique code tracking
	From start to finish
	captured
	capture
	capture transactions
	where the car is
	where the goods are
	Seed to customer
Transparant/betrouwbaar	
	underlying information
	See all data
	All kinds of information
	proof of participation
	That anyone can see that
	Data can be trusted
	Things public
	Instantly visible for everyone
	Instantly see if something has been modified
	Not trusting each other, can work
	Exposure
	history transparency
	Throwing open the whole system
	Trust between people is no longer needed
	Everyone can see
	Everyone trusts
	bring into focus
	Insightful for all involved

Insightful
Chain transparency between parties
See immediately if something has been changed
Irrefutable data
Open data
Open source methodologies
Parties to be trusted
Sensor data trust
transaction administration
Transparently see how rents are set up
Transparent who published what
Transparent
Transparency
Giving transparency
Transparency, being able to trust
Trust
full insight
Accessible to everyone
Where everyone can look in
Little tremulant
To see or not to see something
Visible m tasks
visible
Visible to everyone
Made more visible
visibility

Auditable & validatie	
	achteraf terugkijken
	Audit trail wegschrijven
	Bewijsvoering geregeld
	bewijzen dat ik het gelezen heb
	bewijzen dat je het begrijpt
	bewijzen dat je het boek gelezen hebt
	Blockchain vragen verifiëren
	business controles
	checkvraag
	controles kunnen uitvoeren
	dat het boek wel begrepen wordt
	data over de gebruiker
	Digitale handtekening
	Digitale informatie controleren
	een bepaalde transactie is gebeurd
	Eenvoudig controleren
	fraude voorkomen
	Gaan monitoren
	Goedkeuring
	het boek wordt gelezen en begrepen wordt
	Identificeren zich
	Meetbaar
	melidng maken
	Meten van engagement
	misbruik
	operationele stuurinformatie
	procescontroles
	registratie
	Stimulans productkwaliteit te leveren
	Temperatuur condities is vastgelegd
	verifieerbaarheid van data
	verifieerbare databestanden
	Wat de sensor aangeeft
Data eigenaarschap & privacy	
	Alleen maar bij kunnen wat jouw deel is
	bewijs dat het boek van jou is
	bewijzen dat het boek van jou is
	bewijzen. Ik heb het boek gekocht, het boek is van mij
	claimen dat dit boek van jou is
	Credit score zonder onderliggende gegevens
	data privacy
	Eigen data
	Eigen datakluis
	Eigen inhoud genereerd
	Eigen netwerk

	eigen toegang, eigen verhaal
	Eigen waarde
	Eigenaar eigen content
	Eigenaar van de persoon
	eigenaar van eigen content
	Eigenaar van jouw content
	eigendom
	Garantie eigenaar eigen data
	grip
	het boek claimen
	Je kunt zeggen dit boek is van mij
	Jouw identiteit
	Menselijk/sociaal kapitaal
	Niet bij Google of Amazon terecht komen
	niet vastleggen van persoonsgegevens
	overgang ownership
	Privacy
	privacy is gewaarborgd
	Private messaging
	recht om vergeten te worden
	Volledige controle eigen assets
	Wat anoniem is
	Wel of niet tonen
Data governance	
	Beeld gebracht worden
	Beeld vormen
	consistent aansturen van partijen
	iets gezamenlijk vastleggen
	informatie centraliseren
	informatiepositie
	interactie
	Milieu bewustheid op virus
	Milieubewuster welke type blockchain
	Nieuwe werkelijkheid van alle data
	Overkoepelende metawaarde
	Soevereiniteit
Decentralisatie/gedistribueerd	
	Blockchain (ethereum)
	Centra decentralised
	Data dat niet op computers over de hele wereld staat
	Decentraal
	Decentraal maken
	Decentraal systeem
	Decentralisatie
	gedecentraliseerd
	gedecentraliseerd aanpak
	gedecentraliseerd organiseren
	Gedistribueerd systeem

	Gedistribueerde opslagruimte
	Gegevens gedeeld
	Het is publiek
	Iedereen gebruikt kan worden
	Iedereen kan erop en iedereen kan erop schrijven
	Iedereen logisch beheert
	Open data on chain
	Open ecosysteem
	Openbaar
	Publieke blockchain
	Publieke database
	server blijft overeind
	Social Media platform
	Veel globaler
	Volledige decentrale applicatie
	zelfstandig werkend platform
Desintermediatie	
	Alternatief systeem zonder derde partij
	Bepaalde partijen uit de keten weg kunnen halen
	Financiële partijen eruit halen
	geen drempels ertussen
	Geen tussenpartijen
	interactie beperken
	mensen korter op elkaar zetten
	Overheden wegvallen
	Partijen die weg vallen
	Partijen er tussenuit
	schakels er tussenuit halen
	Tussenpartijen vervangen door Blockchain
	Tussenpartijen verwijderen
	Veel schakels tussen de keten
	Verschillende schakels niet direct contact hebben
	Wegdenken derde partij
	Zonder bank tussen zit
Innovatie	
	alles lezen
	Andere rol krijgen
	anders
	Bedrijfsvoering aanpasen
	betaalmiddel
	Business case
	Businessmodel nadenken
	Coin ontvangen, geld verdienen
	Coins kunnen gebruiken
	Coins ontvangen
	Credit scoring
	data verkopen
	Digitaliseringstap

	disruptive als je niet meegaat
	Eigen munt
	Eigen tokens maken
	Geld verdienen
	In wallet opslaan
	innovatie
	Innovatief imago
	Innovatief overkomen
	met tokens gaan werken
	nieuw business model
	nieuwe business
	nieuwe invalshoek
	onbeperkt verschillende id's generere
	reactie op het boek direct terug kunnen zien
	rol van een partij kan veranderen
	Serey blockchain
	Serey coin krijgen
	Sovern wallet
	Toepassingen op kunnen gaan bouwen
	Tokens gaan betalen
	Transformeren in een nieuwe investering
	transformeerde
	Verdienen aan jouw content
Onmuteerbaar	
	Audit trail kan niet aangepast worden
	blijft het zo staan
	Blockchain kan je nooit meer aanpassen
	daadwerkelijk identieke id's kunnen toekennen aan boeken
	Dat data goed vast is gelegd en niet gewijzigd
	Data dat die goed is
	Data niet meer verwijderen
	een unieke QR code
	fouten
	gegevens op de blockchain vastleggen
	Jouw berichten niet verwijderen
	kopieën voorkomen
	Niet gemanipuleerd
	Niet iedereen kan een kopie maken
	niet meer van de blockchain
	Niet meer veranderd kan worden
	niet meer verandert kan worden
	Onweerlegbaar
	Onweerlegbaar vastgelegd
	Uitdrukken op manier dat niet te censuren is
	zeker weten
	zorgen dat het boek uniek wordt.
Procesverbetering & efficiëntie	

Niet zo vaak meer langs hoeven gaan
Aanbiedingen doen
Aangeven wat ambities zijn
aantrekkelijke data
adminstratieve lasten afnemen
Afstanden zijn groot (ook fysiek)
Alles is al gefinancierd alles draait, je hebt geen Venture Capital nodig.
Alternatieve inrichting om bottelnecks weg te halen
ander werk
Andere kortere rollen
andere manier beschikbaar
andere plek opslaan
Andere werkwijze dan voorheen
Anders organiseren
asset die waarde toevoegd
Automatisch kan worden afgehandeld
Automatisch schadevergoedingen afhandelen
Beter content
Beter reflecteren
Beter zien hoe hij beloond wordt
Betere huurprijs
Betere inhoud
Betere job vinden
Betere performance
betere prijsafstemming
Betere rendement via de bank
blij met het model
bol.com/intermidiar buitenspel zetten
chauffeurs meer verdienen
coins terug verdienen
concurrentievoordeel
Content alleen geliked als het goed is
content creëren
Credit score berekenen
Daarmee settelen (betalen/vereffenen)
de Bitcoin Layer, daar zijn de kosten straks 0,0
Dingen doen die passen bij hun eigen waarde
Dingen goed afgehandeld
dingen veranderen
Direct met elkaar zaken doen
Draait op je eigen telefoon
Drempel om laag brengen
eenvoudiger
Efficiënter maken
Efficiënter proces
Efficiënter verlopen
Efficiëntie

Elkaar ondersteunen
en heel snel
Finance regelen
Financiële afhandeling
Financiële assets
Financiële belangen
Financiële voordeel
gedeelte van je geld terug
geen administratieve omkijken
geen administratieve tussenpartij
Geen facturen hoeven te sturen
Geen frictie op gebied van taal en locatie
geen papieren invullen
geen ruis op de lijn
Geld krijgt
Geld verdienen
Geld verstrekken
gemak neemt toe
Gerelateerde features
gerichter inspelen
Goede kwaliteit
Goede prestaties belonen
Goede prestaties leveren of niet
Goede prestaties levert
Goedkoop organiseren
goedkoper
heel veel kilometers kunt besparen
hele wagenpark informatie verstrekken
Het werk makkelijker wordt
Hoe je je eigen geest expressie geeft
hoge engagement
Hybride syseem
Impact van de studie op baankansen
Inefficiënties tegengaan
informatie delen
Informatie digitaal opslaan
informatie sneller beschikbaar
Informatie uitwisselen
informatie uitwissen
informatie voordeel
Intentie een gemak heeft
interactie
makkelijker maakt
Kans lening wel of niet betaald
Klant geholpen
Kleinere kans dat de geldverstrekker geld niet terug krijgt
koppelen aan het handelsregister
korting krijgen

Kosten lager kunnen zijn
Kosten verdelen
Kosten vs Baten
kostenvoordelen
krachtige dingen mee bouwen
Kunnen matchen
Kunnen samenwerken
kwalitatief completer
Leuke platform voor lezer
Leverancier geholpen
Makkelijk schaalbaar
Makkelijker
Makkelijker data verwijderen
Makkelijkere wijze geschikte kandidaat door algoritme
Matchen
Matching doen
Matching en algoritme
Maximaal geld mee te verdienen
meer connectie
meer informatie delen over de kwaliteit
Meer rendement op eigen geld
Meer waarde munt
Mensen bij elkaar brengen
Mensen gaan nadenken wat ze zeggen
Mensen helpen
Met elkaar communiceren
minder hoeven te doen
minder hoofdkantoren nodig hebt
minder mensen
minder nodig
Minder vaak zeflde informatie
minder werk
mogelijkheden informatie uit te wisselen
Netwerkeffect
Niet een centrale computer is een bottleneck
Niet te managen
Niet zoveel papierwerk meer
nieuwe kanalen
Onderlinge settlements doen
Ontwikkelplan
optimaliseren van kanalen
partijen samenbrengen
Persoonlijk leerplan
Persoonlijk ontwikkelplan voor student
Persoonlijke informatie opzoeken
Praktische problemen oplossen
proces van eigen bedrijf wijzigen
processen optimaliseren

	Productkwaliteit verbeteren
	rechstreeks contact
	Rendement behalen
	Return on investment intentie
	Rol aanpassen
	Rollen veranderen
	samenwerking
	Samenwerkingsverbanden tussen partijen
	scannen
	Schaalbare systemen creeren
	Schets maken
	Scoring berekenen
	selfservice
	simpel invoeren
	smart-contract gebruiken om betalingen automatisch te laten doorkomen
	snelheid
	Snellere afhandelingvan betaling
	Snellere weg
	Spullen goed aankomen
	systeem vervanging
	tijd stoppen in andere dingen
	transactie kosten van Bitcoin zijn momenteel een van de goedkoopst
	Uigeverijen vervangen
	Veel efficiënter
	Veel makkelijker
	Veel makkelijker (geen papieren rommel)
	veel meer informatie dan dat
	verandering
	vereenvoudigde versie
	Verhelderend
	Verschaft onszelf rente
	Vervoerder die het goed doet
	Vervolg van bestaan waarborgen
	Verwachte rendement
	verwerken
	voordeel verschuiven
	voordeliger
	Vrij geavanceerd
	wagens voller gaan rijden
	Werk gemakkelijker wordt
	Wij gaan elke ondersteunen
	Zichzelf hybride maken
Regelgeving	
	bepaalde mensenrechten
	Contracten
	En weer intrekken

	Garantie
	Goede protocollen
	meteen afgestraft
	Nieuwe regelgeving
	Protocol
	Protocol heeft bepaalde regels
	Protocol is uitgevoerd (via sensor)
	Protocol managen
	Settlements doen
	Smart contracts gebruiken
	Smart contracts ondersteunen
	Toestemming geeft
	Tokens nodig om transacties uit te voeren
	tot concensus over geschillen
	Volgens afspraken groter geheel zien
	Wetgeving op de juiste wijze toegepast
Security	
	Akkoord gaan
	deels publiekelijk toegankelijk
	geen gegevens worden gelekt
	Je bent de enige die dat kan
	met encryptie kun je gegevens beschermen
	Niemand kan je gegevens inzien tenzij je toestemming geeft
	niet toegankelijk is
	Premissie
	Privacy
	Privacy aspecten
	Privacyrisico oplossen
	security
	Security checks
	Stukje document in kunnen zien
	Toegang content
	Veilig
	veiligheid gegevens
	Wel of niet verbergen
	Welke username achter bepaalde publicaties
Traceerbaarheid en tracking	
	afkomst van bepaalde grondstoffen
	Allemaal bijgehouden
	alles on chain
	Automatisch afhandelen van schade
	Bewijzen wat er is gebeurd met de transacties
	bijhouden
	Bijhouden van alle transacties
	document uitwisselen
	doorgeven
	Een bepaald moment ingezien
	Eigen Seed Trace

	elk moment
	elk moment intrekken
	Financiële middelen volgen
	herkomst
	herkomst van goederen
	Iedere partij exact de transactie kan zien
	Informatie uitwisselen
	levensduur volgen
	Metadata VOG vastleggen
	overdrachtsmomenten vastleggen
	QR code
	realtime
	Seat trace
	Settlements over transacties
	status van de auto die
	terugleiden naar de bron
	Traceability van Assets wetgeving
	traceren
	Transactie vastleggen
	Transacties doen
	Transacties kunnen volgen
	transactiesnelheid
	unieke code traceren
	Van begin tot eind
	vastgelegd
	vastleggen
	vastleggen transacties
	waar de auto zich bevindt
	waar de goederen zich bevinden
	Zaadje tot klant
Transparant/betrouwbaar	
	achterliggende informatie
	Alle data zien
	Allerlei informatie
	bewijs van deelname
	Dat iedereen dat kan inzien
	Data kan vetrouwen
	dingen openbaar
	Direct zichtbaar voor iedereen
	Direct zien als iets aangepast is
	Elkaar niet vertrouwen, kunnen samenwerken
	Exposure
	geschiedenis transparantie
	Hele systeem open gooien
	Het vertrouwen tussen mensen is niet meer nodig
	Iedereen kan zien
	Iedereen vertrouwt
	in beeld brengen

Inzichtelijk voor alle betrokkenen
Inzichtelijker wordt
ketentransparantie tussen partijen
Meteen zien als er iets is aangepast
Onweerlegbare data
Open data
Open source methodieken
Partijen vertrouwd worden
Sensor data vertrouwen
transactieadministratie
Transparant inzien hoe huurprijs is opgesteld
Transparant wie wat gepubliceerd heeft
Transparanter
Transparantie
Transparantie geven
Transparantie, het kunnen vertrouwen
Vertrouwen
volledig inzicht
Voor iedereen toegangbaar
Waar iedereen in kan kijken
Weinig trammelant
Wel of niet iets zien
Zichtbaar maken
zichtbaar maken
Zichtbaar voor iedereen
Zichtbaarder gemaakt
zichtbaarheid

Various words were used to express the added value of **innovation** in the category, according to the interviews. Participants talked about how innovation could lead to a different job or a different way of doing things. They underlined the significance of modernizing corporate practices and embracing novel business model ideas. Participants expressed a desire to receive and utilize coins for a variety of uses, and the idea of using a digital money or creating one's own currency and tokens was also addressed. Innovation was viewed as having key components, such as credit scoring, data sales, and digitization. The interview highlighted how new business models and revenue streams are created using cryptocurrency, tokens, and creative applications. Participants stated a desire to utilize digitization, produce and sell content, and challenge established systems and middlemen. The disruptive potential of not keeping up with innovation was underlined, as well as the significance of seeming inventive to maintain a competitive edge. Also suggested were the possibilities of utilizing tokens to create various IDs, of watching people's responses to a book up close, and of having the party's role change. The ability to start developing applications on the blockchain was highlighted, as well as how to use blockchain coins, store them in wallets, and use them. The possibilities for new business models and perspectives as well as the transformative power of innovation were stressed. Participants also expressed a desire to profit from their content through creative methods. Additionally, being original, appearing inventive, and having the capacity to respond quickly to consumer feedback were all stressed in this area. Additionally addressed were the prospects for changing sectors, making money from content, and investigating new investment opportunities. Overall, the interviews brought attention to the varied and complex ways in which innovation in this field can offer value.

For **process improvements and efficiency**, participants talked about the advantages of fewer visits needed, as well as the advantages of being able to make proposals and express goals more clearly. The elimination of bottlenecks and the lowering of administrative burdens were both regarded as positive factors. The benefits of various methods of information organization and storage, as well as the automation of claim handling and other operations, were also stressed by the participants. The greater price matching, better performance, and general content improvement were emphasized. Participants reported satisfaction with the program and the possibility of increasing earnings through creative methods. The convenience of digital information storage and interchange as well as the efficiency obtained in various financial operations were underlined. The capacity to work more productively, the facilitation of communication and collaboration, and the ease of access to pertinent information were thought to be important outcomes. Participants also discussed the possibility of cost reduction, cost splitting, and improved cost-benefit analysis. The potential to scale systems, the rise in coin value, and the capacity to unite individuals and promote collaboration were also emphasized. The respondents emphasized the importance of process enhancements and efficiency in raising output, cutting costs, and getting better results across a range of fields. The category also highlighted the benefits of speed, simplicity, and efficiency brought about by blockchain technology, such as improved automation, accelerated payment processing, and simpler entry procedures. Participants talked on how implementing blockchain (based) system may improve channels, foster collaboration between parties, and increase return on investment.

Participants in the interviews highlighted the significance of the **auditable and validation** features offered by blockchain (based) systems. The opportunity to look back later and have a clear audit trail was one element that was mentioned. It was thought that the blockchain's ability to track transactions and leave a paper trail of proof was helpful in authenticating choices and actions. Participants brought up the necessity to demonstrate that readers have read and comprehended

specific information, such as books, and the possibility for blockchain to organize and record data about readers' interactions with the content. To guarantee the validity and verifiability of data and transactions, the idea of blockchain (based) digital signatures was also brought forward. Participants stressed the importance of being able to quickly check and confirm certain transactions or data, since this reduces fraud and ensures operational control. Results that could be used to gauge engagement, create high-quality products, and establish data verifiability were thought to be beneficial. Participants emphasized the significance of self-identification and having quantifiable performance indicators. Process controls, registration, and delivering stimuli based on predetermined circumstances were also discussed in this category. The interviews highlighted the value-added of auditable and validation processes in delivering assurance, accountability, and trustworthiness in a variety of scenarios.

Participants talked about several terms that described the added value under the subject of **data governance**. They placed emphasis on the capacity of data governance procedures to create and preserve an image or reputation. To consolidate information and forge a solid information position, participants emphasized the value of continually directing and documenting information collaboratively. Additionally, the idea of interaction was brought up, highlighting how collaborative data governance processes are. Participants talked on how important data governance is for promoting environmental awareness, especially regarding virus control. They underlined the need for increased environmental awareness and looked at the potential of various blockchain technologies to help achieve this. The interviews stressed the crucial role data governance plays in adjusting to the new data environment and creating a broad meta value. Additionally, the idea of sovereignty was brought up, demonstrating the participants' desire for ownership and control over their data. The debates brought to light how crucial good data governance procedures are for preserving sustainability, integrity, and trust in the digital age.

Participants in the interviews described **transparency and trustworthiness** using a variety of words. They stressed the value of having access to all types of information and the capacity to see the underlying information, both of which help establish confidence. The capacity to rapidly check the validity and integrity of data was mentioned by participants as being something they would like to see more of. The idea of participation evidence was brought up, emphasizing the openness and responsibility of activities. Participants talked on the importance of having information readily transparent to everyone so that any changes can be easily verified. They stressed how openness promotes trust and removes the need for individuals to rely on interpersonal trust. The interviews also emphasized the idea of exposure and history transparency, highlighting the advantages of making the entire system transparent so that everyone can see and believe the information. Participants spoke on the value of unfalsifiable data, open data, and open-source techniques in fostering transparency and trust. They stressed the importance of clear transaction administration, understanding how rents are organized, and knowing who published what. The category emphasized the significance of party trust, chain transparency, and system and transaction history visibility. The idea of trust and openness was frequently brought up, with participants expressing a need for complete understanding and open access to information. The value of visibility and transparency in fostering trust and facilitating wise decision-making for all stakeholders was underlined during the conversations. The interviews also covered how blockchain may help build trust, guarantee reliable data, and provide complete transparency for all parties involved. For the purpose of creating a trustworthy and responsible system, participants underlined the significance of visibility, transparency, and dependable data.

The **immutability** notion was essential to the results, highlighting the participants' need for data that could not be altered or tampered with on the blockchain. The integrity and dependability of the data are ensured by the fact that once it has been recorded on the blockchain, it cannot be changed or removed. The idea of a non-modifiable audit trail was brought up, emphasizing the transparency and trust that come with a non-modifiable record. Participants stressed the significance of making sure that data is accurately captured and not prone to fraud or mistakes. They talked about how to give similar IDs to books or other assets by using special identifiers like QR codes, which would increase their uniqueness and traceability. Interviewees expressed a need for knowledge to be expressed in ways that cannot be changed or censored, emphasizing the importance of unquestionable and uncensorable facts. Participants stressed that information is immutable and gives assurance once it is recorded on the blockchain. They emphasized the importance of making sure that books or other assets become unique and have an unchangeable permanent record. The immutability and irrefutability of data on the blockchain were underlined as a crucial added feature, ensuring trust, transparency, and authenticity, throughout the conversations.

Participants in the interviews emphasized the added value of blockchain (based) systems in the area of **disintermediation** by removing middlemen and generating alternative systems devoid of third parties. The discussions underlined the need to do rid of the obstacles and middlemen that are now present in a number of processes and transactions. Participants discussed the possibility of eliminating particular participants from the chain, such as financial institutions or middlemen, to allow for more direct communication and business dealings between interested parties. The idea of bringing people together and eliminating the need for middlemen in order to lessen complexity, expenses, and potential points of failure was underlined throughout the interviews. Participants raised the prospect of using a blockchain (based) system to replace middlemen, enabling direct and secure interactions without the need for centralized control. The conversations also touched on the possibility of getting rid of regulatory or governmental middlemen, imagining a system in which these organizations would play a smaller role or perhaps disappear. The interviews brought to light the benefits of eliminating middlemen, establishing direct connections, and facilitating transactions without the use of banks or middlemen. Participants cited the need for an alternative approach that would encourage participant-to-participant communication while removing the need for third-party intervention and administrative costs. The capacity to transact without using banks and the desire to increase autonomy and ownership were also mentioned in this category. Overall, the discussions focused on how blockchain (based) systems have the power to challenge established intermediation methods by facilitating direct and decentralized communication between concerned parties.

The interviews made clear how important **data ownership and privacy** are as key components of value addition in blockchain (based) systems. The desire of the participants to be in charge of their data and demonstrate ownership of their digital possessions, such as books and other content produced by networks and platforms, was expressed. With the idea of data vaults and private messaging networks built on blockchain technology, they underlined the importance of data privacy and the capacity to protect personal information. The interviews also brought attention to the right to be forgotten, which gives people control over their personal data and the option to ask for its removal when necessary. Participants indicated worries about the collection of personal information and a wish to keep their data away from major companies like Google or Amazon. The importance of privacy, ownership, and the capacity to retain control over one's own possessions and data was underlined during the debates. The interviews brought home how important it is to safeguard data privacy, give people complete control over their personal information, and provide open means for establishing ownership and defending privacy rights. The additional value in this category focused on

giving people greater control over, ownership of, and privacy regarding their personal data in a digital environment.

In terms of **regulations**, the interviews emphasized how blockchain (based) systems might help enforce some human rights and make it easier for people to comply with the law. Participants talked about using smart contracts and protocols to make sure that settlements and transactions follow certain laws and regulations. Additionally highlighted as a beneficial feature for regulatory reasons was blockchain's capacity to offer transparency and consensus on disputes. The interviews covered the significance of having sound protocols in place as well as the requirement for new laws to take into account the developing blockchain technology landscape. Participants acknowledged how effectively blockchain might administer protocols and enforce laws. Additionally highlighted were the role of consensus in achieving agreements as well as the utilization of tokens for transactional purposes. The usefulness of blockchain in encouraging regulatory compliance, supplying transparency, and facilitating the right implementation of laws and protocols was highlighted in the interviews.

The basic tenet of blockchain (based) systems, decentralization, was underlined in the interviews under the heading of **decentralized and distributed** systems. Participants talked on the advantages of a decentralized strategy and the use of Ethereum-like blockchain systems. They emphasized the dispersed nature of data storage, where data is spread across computers throughout the world rather than being stored on centralized servers. Participants underlined the significance of getting rid of middlemen and setting up a decentralized network where information is exchanged across numerous computers globally. The public nature of blockchain, where anybody can access, use, and write on the blockchain, was also addressed in the interviews. There was also discussion of the idea of logical management, in which everyone participates in the network and contributes to its operation. Decentralized systems, such as open blockchains and databases, are distinguished for being global and open. The possibility of decentralized applications and the rise of standalone platforms were also discussed. Participants expressed a need for substitute systems that function independently of other parties, promoting greater innovation and fresh business ideas. Additionally, the category covered tokenization, the function of cryptocurrencies, and the possibilities for earning and holding assets via blockchain technology. In general, the interviews emphasized the importance of decentralization in fostering openness, transparency, and accessibility on a global scale in the context of blockchain (based) systems.

The interviews made clear how crucial it is to use blockchain (based) systems to **track and trace** different parts of transactions and assets. Participants talked on the need for openness and accountability throughout the supply chain by being able to trace the provenance of goods, assets, and raw materials. The ability to track goods, transactions, and assets throughout their lifecycle was mentioned by participants. They made sure to underline that everything is documented on the blockchain, enabling automatic and real-time transaction tracing. The exchange of information and document tracking, which allows parties to observe certain transaction details and transfer moments, were also noted in the interviews. The usage of distinctive codes, like QR codes, was emphasized as a way to track and trace certain goods. Participants understood the need of documenting transaction data, following transactions from beginning to end, and being able to monitor the whereabouts and status of assets, such as vehicles or products. The idea of asset traceability has been expanded to include asset lifecycle tracking and compliance with relevant laws. The benefits of blockchain in offering a real-time, transparent, auditable tracking system that improves traceability across diverse transactions and assets were underlined throughout the interviews.

The interviewees in the **security** category stressed the significance of using blockchain (based) systems to protect data and guarantee privacy. Participants noted that privacy and data security concerns are essential to blockchain solutions. They emphasized the capability of encrypting data, which enables people to safeguard their information and manage access to it. The interviews also stressed the fact that information is kept private and safe and that nobody can access it without express consent. Participants understood the value of security measures and safeguards against privacy issues. The interviews emphasized the idea of hiding some information, including the username behind particular articles, highlighting the security and privacy benefits offered by blockchain technology. Overall, the conversations showed a focus on securing data, protecting privacy, and putting effective security mechanisms in place to preserve sensitive data within

Appendix 25: Reflection technical design versus actual

The original plan outlined a meticulous strategy for conducting the study, featuring a team of four members conducting a total of 16 interviews. However, the reality turned out to be quite different, presenting significant contrasts with the initial intentions.

First and foremost, it was not possible to conduct 16 interviews as planned. The team was unable to recruit the required number of participants due to the lack of interest from potential volunteers and the time restrictions imposed by the study's schedule. It is also important to note that the researchers managing the study were also managing their full-time professional obligations. This issue made it more difficult to carry out the research because it severely limited the amount of time available. The time that could be devoted to conducting interviews, evaluating data, and interpreting conclusions was inevitably constrained by the demands of their principal professional obligations and the added research tasks. As a result, the limited time may have had an impact on the study's investigation's depth and breadth. As a result, just 11 interviews were successfully conducted, which is a significant departure from the original goal.

Additionally, it was not possible to meet the expectation of acquiring additional documentation from the participants to back up the information from the interviews. Although it was acknowledged that such records might not exist, their absence was proven by reality. The participants did not provide any more information to support their conclusions or offer a more thorough viewpoint. This lack of supporting evidence imposed a serious restriction on the study, potentially restricting the breadth of the analysis and the general validity of the conclusions.

To achieve a shared understanding between the interviewers and interviewees, it was also realized during the trial phase of the study that some terms and concepts needed to be clarified. The study team created a thorough definition list to address this. This list's contents were later examined during the interviews to determine whether more explanation or clarification was required. It was provided to participants along with the original email invitation. The full list of definitions is available for reference in appendices 16 and 17 of the study report.

Furthermore, it became clear that every interview had to be performed through Microsoft Teams only, with its transcribing feature being used to provide written records. The practicality and simplicity provided by the Teams platform, which allowed for face-to-face interviews in the original concept, most likely had an impact on this change. It is important to note that this change might have brought with it a new set of issues, such as possible restrictions on nonverbal cues or the effect of technical aspects on the interview dynamics.

In conclusion, the study's execution differs from the initial design. Due to a paucity of responses and time constraints, the 16 interviews that were originally planned were only conducted with 11. Participants were not provided with the additional supporting materials that were expected. The interviews, which were initially planned to be a combination of in-person and online contacts, were exclusively carried out using Microsoft Teams and its transcribing features. Finally, the researchers' ongoing full-time work commitments limited the amount of time they had for the research. These modifications and restrictions emphasize the flexible character of research and the requirement to change to and deal with unforeseen events as they arise.

The interview question used during the try-out phase yielded the anticipated responses, indicating that no amendments were necessary. As a result, the interview question used during the try-out phase was included in the set of 11 interviews conducted for the study. The inclusion of the try-out

phase interview further enriched the data collected, providing valuable insights and perspectives in line with the research objectives.

Appendix 26: Conclusion of research

Blockchain (based) systems could create new company models, job opportunities, and revenue streams in terms of innovation outcomes. It makes it possible to create distinctive tokens, digitize business processes, and change how business processes are adjusted. The adoption of blockchain also promotes an innovative image and enables open customer participation and feedback. Additionally, the adoption of blockchain technology has the potential to upend entire industries if companies do not adopt it.

Another area where blockchain shows its usefulness is in process optimization and efficiency. Blockchain simplifies processes and boosts efficiency by doing away with middlemen, lowering administrative burdens, and improving workflows. Faster payment processing, automated claim management, and improved content development and distribution are all made possible by technology. Additionally, it encourages cooperation, assistance, and cost-cutting.

The unchangeable feature of blockchain strengthens auditable and validating capabilities. The technology guarantees accurate data recording, prevents data modification, and offers an audit trail for proof. As a result, trust is fostered, fraud is avoided, and operational control and transparency are improved. Blockchain also makes it possible for claims and processes to be handled automatically, assuring compliance and providing proof.

Blockchain's capacity to consolidate and safeguard data results in better data governance. In addition to protecting privacy, ownership, and control, it enables parties to jointly record and access data. In addition to encouraging environmental awareness, blockchain provides fresh approaches to managing and governing data, ensuring data sovereignty and providing a broad meta value for data management.

The adoption of blockchain (based) systems has important results in terms of transparency and trustworthiness. Data can now be instantly and publicly viewed thanks to technology, preventing it from being readily falsified. The irrefutability of blockchain and its open-source approaches foster transparency, accountability, and understanding between parties. With blockchain, financial transactions, product quality, and the removal of central intermediaries are all made transparent and trustworthy.

Immutability, which ensures that once data is recorded, it cannot be changed or erased, is a crucial component of blockchain (based) systems. The trustworthiness, integrity, and irrefutability of the data recorded on the blockchain are all influenced by this quality. Additionally, blockchain provides techniques to establish uncensored data expression, establish unique identifiers, and prove ownership.

Transparency and trust ability are significant outcomes of blockchain implementation. The technology allows for the public and instant visibility of data, ensuring that information is not easily manipulated. Blockchain's irrefutability and open-source methodologies enhance trust between parties and promote an insightful, verifiable, and accountable environment. The transparency and trust ability provided by blockchain extend to financial transactions, product quality, and the elimination of central intermediaries.

Immutability is a key aspect of blockchain (based) systems, ensuring that once data is recorded, it cannot be modified or deleted. This attribute contributes to the credibility, integrity, and irrefutability of the information stored on the blockchain. Additionally, blockchain offers

mechanisms for proving ownership, establishing unique identifiers, and expressing data in ways that cannot be censored.

Blockchain-enabled disintermediation removes obstacles and middlemen, allowing for direct communication and business transactions between parties. It lessens the need for intermediaries' involvement, centralization, and control, enabling alternative solutions. This enables direct collaboration and decision-making between stakeholders, increases efficiency, and reduces costs.

Privacy and data ownership are key components of blockchain (based) systems. It gives people authority and ownership over their data, enabling them to establish their rightful ownership and reclaim their information. Blockchain guarantees data security, privacy, and the right to be forgotten. A person's complete control over their money and personal data is ensured by the secure messaging feature and prevention of illegal access.

A key component of the blockchain ecosystem is regulation. Blockchain complies with predetermined guidelines and standards, enabling regulatory compliance while providing smart contracts and settlements. The technology offers a visible and auditable framework for monitoring and tracking transactions, ensuring that laws are applied correctly, and promoting agreement in the resolution of disputes.

Blockchain's ability to spread data and control among numerous nodes or participants is one of its key characteristics. This decentralization encourages a more open, global ecosystem and reduces the possibility of a single point of failure. It promotes creativity and teamwork by enabling the creation of decentralized platforms and apps.

Blockchain's capability to record and track transactions from beginning to end strengthens traceability and tracking. In addition to giving a clear view of transaction history and verifying the origin and integrity of data, it enables the transparent tracking of assets, goods, and financial resources. Real-time tracking, information interchange, and lifecycle tracking are made possible by blockchain, which improves accountability and trust.

A crucial component of blockchain (based) systems is security. Data security and privacy are guaranteed by the decentralized nature of blockchain, encryption, and permission-based access. Blockchain offers a secure setting for access to content and documents, reducing privacy threats and safeguarding sensitive data. It enables people to maintain control over their data and makes sure that only parties with permission can access it.