Bachelor's Thesis in Information Systems

Inside Blockchain Consortia: What a Stakeholder Overview tells us about their Functioning

Submitted to
Department of Informatics (IFI)
Information Management Research Group,
Prof. Dr. Gerhard Schwabe
Binzmühlestrasse 14, CH-8050 Zürich

By Franck Huber
Südstrasse 12, CH-8800 Thalwil
E-Mail: franck.huber@uzh.ch
Matriculation number: 16-701-310
Bachelor of science in Informatics (Information Systems)

Advisor: Dr. Janine Hacker and Rafael Ziolkowski
Supervisor: Prof. Dr. Gerhard Schwabe

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Abstract

As a growing number of organizations recognizes the potential of blockchain for new business models, inter organizational collaborations using blockchain are on the rise. Based on interviews with 53 members of 19 consortia applying blockchain toward a shared objective, this thesis studies motivations and dynamics within blockchain collaborations. Primary motivations for forming the consortia were efficiency and financial gains, innovation and gaining experience with the technology.

Regarding dynamics in blockchain consortia, a not blockchain-specific factor (alignment on vision) is cited as the main hurdle, and the interviews suggest that some challenges emphasized in prior, non-blockchain research (e.g. power clashes) are less prevalent in the blockchain consortia.

Zusammenfassung

Da eine wachsende Anzahl von Organisationen das Potenzial von Blockchain für neue Geschäftsmodelle erkannt hat, gibt es immer mehr Zusammenarbeit unter Firmen zum Thema. Aufbauend auf Interviews mit 53 Mitgliedern von 19 Konsortien, welche Blockchain nutzen, um ein gemeinsames Ziel zu erreichen, untersucht diese Arbeit die Motivation und Dynamik innerhalb von Blockchain-Kollaborationen. Wichtigste Motivatoren für die Bildung der Konsortien waren Effizienz und finanzielle Gewinne, Innovation und das Sammeln von Erfahrungen mit der Technologie.

Bezüglich der Dynamik in diesen Konsortien wird als Haupthürde ein Faktor genannt, der nicht Blockchain-spezifisch ist: Schaffung einer gemeinsamen Vision. Des Weiteren wird ersichtlich, dass gewisse Herausforderungen, die in der generellen Forschung betont wurden (z.B. Machtkonflikte), in den Blockchain-Konsortien weniger erkennbar sind.

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1.   Introduction

1.1.   Motivation and Relevance

This bachelor thesis is part of a larger study, which aims to understand what is needed for the implementation of a blockchain solution as a consortium to succeed and what can cause it to fail. Within this context, the goal of this thesis is to understand the dynamics between members of the consortium to determine how inner relations can cause success or failure of a blockchain consortium. To achieve this, an empirical study was conducted where 18 consortia are analyzed by identifying the members of the collaboration including their interests, expectations, and motivations to participate. In a next step, observations are made on how the relations are managed and lived within the collaboration. The 18 cases have in common that organizations decided to collaborate to construct a system or a platform where blockchain is used as an underlying technology. For every case, there are two to four interviews which were done with individuals who represent an organization involved in the collaboration. There are 53 transcribed interviews, which represent the data used for this thesis.

Inter-Organizational networks (IO networks) describe a form of alliance, where several organizations join forces to accomplish a common goal. Usually participants have different skillsets and by forming a network they can use each other's strengths. This 'access to and leveraging of resources' is the first potential benefit described by Popp, Milward, MacKean, Casebeer and Lindstrom (2014). Other possible benefits are generated by 'sharing risks', 'having a seamless service quality and coordination', 'learning and capacity building through knowledge exchange', 'innovation' and many more. But working as an IO network is not without its challenges. Examples are 'culture clashes', which is when different organizations meet with different ways of doing things or 'power imbalances' which can lead to hostility. The list of challenges is not short either and if these risks are not mitigated can lead to a failure of the project. As a first step to build a sustainable playbook for these organizations, it is necessary to establish a detailed understanding of these organizational arrangements, e.g. which organization wants what for which reason in which intensity.

With blockchain being available as a new tool, IO networks emerge trying to make use of the potential it offers. In this bachelor thesis we want to explore the dynamics of IO networks on the case of blockchain consortia in the framework of a study conducted by the Information Management Research Group (IMRG) led by Prof. Dr. Schwabe. The IMRG has conducted interviews with several actors of 19 consortia, where each consortium is either an IO network or a public-private partnership. In order to better understand what is needed for the implementation of a Blockchain solution as a consortium to succeed and what can cause it to fail, this bachelor thesis helps in gaining an understanding of the dynamics between the stakeholders in these environments, by studying the interests and expectations of the participants.

Doing so, we hope to identify different types of players with unique motivations, prospects, and skills. Furthermore, we want to show dynamics between the players, e.g. tensions which arise and how these are resolved and the influence of these dynamics on the consortium's work. This will be used for a comparison to known interests, expectations, and dynamics in IO networks, which will allow an identification of blockchain specific interests, expectations, and dynamics.

1.2. Research Questions and Goals

To understand the dynamics of IO networks using blockchain, four research questions have been formulated, which will guide the thesis towards that goal. Research question (RQ) 0 is of methodological nature. It is designed to ensure that the optimal framework is used when evaluating the data:

RQ0: How can interests and expectations of different stakeholders be analyzed?

Research questions 1 and 2 aim at understanding the interests, expectations, and motivations of the participants of the blockchain consortia. To understand RQ1 and 2 the participating organizations are additionally identified and discussed:

RQ1: What are the interests and expectations of consortium stakeholders?

RQ2: What motivates the interests and expectations?

Finally, research question 3 aims at understanding inner dynamics of the consortium. Inner dynamics are defined to be observations of situations, collaborations, or interactions, resulting from their interests, expectations, and motivation. Due to the relevance of blockchain in this analysis, the influence of blockchain on collaboration is discussed as well:

RQ3: What are the implications of interests and expectations on the consortium's work?

1.3. Nomenclature

The following terms have a specific meaning in this thesis.

Collaboration forms

While in the introduction and the title the word 'consortium' is used, not all interviewees agreed that the word fits their collaboration. As can be seen in the literature background in chapter 2, such collaborations are often referred to as 'inter-organizational networks' or 'IO networks' for short. In the results section, chapter 4, the collaboration forms are named the way the interviewees chose, which might be 'consortium', 'legal entity', or 'association'.

Members

Depending partly on the legal setup, members of an IO network can be referenced as 'members', 'partners', 'participants', 'stakeholders', 'shareholders', 'organizations', 'roles' or 'contractors'. Where possible the words 'participants', 'organizations', or 'roles' will be used. 'Participants' are a superset of 'roles' and 'organizations'. A 'role' is usually in plural (e.g. Banks) and organizations are in singular (e.g. Bank). Roles are a superset of organizations which are homogenous either in their purpose or in their interests and motivations.

Interests, Expectations, and Motivations

The words 'interests', 'expectations', and 'motivations' are used throughout the thesis to understand members and projects. 'Interests' and 'expectations' are lower level and result from 'motivations', which are higher level. It is possible for interests to have several levels of motivations precede them. The figure 1 visualizes this multi-level possibilities of interests and motivations. Interests usually describe a desire which the members can work on to achieve it, whereas expectations are desires towards other members or the environment.
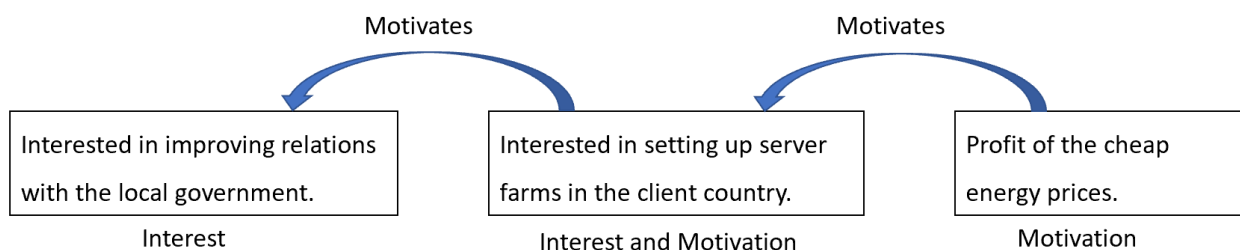
Figure 1: Multi-level interests and motives. Own representation.

1.4.   Thesis Outline

After introductory remarks on the motivation for the thesis, showing the research questions and providing context in chapter 1, the literature background is given in chapter 2 for the topics of blockchain, IO-networks, and stakeholder analysis. Followed by the methodology in chapter three, which also contains the results of RQ0. Results for RQ1 – 3 are shown in chapter four. In chapter five the results are discussed. Finally, in chapter six a conclusion and a summary are given.

The cases used for the empirical analysis are shown in the table below. The ID was given by the IMRG and the cases were renamed for the thesis. All names of the collaborations and of the collaborators have been anonymized and replaced with their purpose. The 19 projects are heterogenous in their purpose, there are:

a) Data markets, where organizations can buy and sell data.

b) Trade platforms, where blockchain is used due to its trustful nature.

c) Governmental registries.

d) Track and trace within a supply chain or delivery.

e) Approval processes.

f) To share knowledge and experiences with blockchain within an industry.

g) To conglomerate complementing services on a single platform.

The case C14 – Governmental Registries Company was not analyzed, due to it not being an inter-organizational collaboration for setting up a blockchain solution.

Table 1: Overview of studied consortia including purpose and interviews. Own representation.

ID	Name given	Purpose	Number of interviews
C01	Data market for the car eco-system	a	4
C02	OTC trading platform	b	3
C03	Land Registry	c	4
C04	Track and trace of pharmaceuticals	d	3
C05	ERP system for SME e-commerce	g	3
C06	Peer-to-peer energy trading	b	3
C08	Service platform for shipping	d, g	3
C09	Data market for patient health data	a	4
C10	Improve trade financing	b	3
C11	Health insurance approval	e	3
C12	Temperature tracking of deliveries	d	2
C13	Bank Blockchain community	f	2
C14	Governmental Registries Company (not analyzed)	c	2
C15	Track fish from fisher to consumer	d	2
C16	Trade platform for previously non-bankable products	b	3
C17	Energy trade between households	b	2
C18	Commodity trade platform	b	3
C19	Mobility as a Service platform	g	2
C20	Improve trade financing (2)	b	2

2. Literature Background

The literature search was conducted on three broad topic areas important for this thesis: blockchain (chapter 2.1), inter organizational networks (chapter 2.2) and stakeholder analysis (chapter 2.3). Background on the methodology used to identify relevant sources is provided in section 3.1.

2.1. Blockchain

Zwitter and Boisse-Despiaux (2018) describe blockchain as a decentralized database, which stores a registry of assets and transactions across a peer-to-peer network. Blockchain systems do not have a central control system and the transaction history is stored in blocks of data, cryptographically locked together. To add a block the transaction must be validated by the system, which is called the consensus process (Cachin & Vukolić, 2017). The data is replicated on every computer that belongs to the network, which makes blockchain an immutable, secure, and transparent record of all transactions. Additionally, smart contracts can be added, which are a set of logical rules embedded into a blockchain to govern transactions (Sultan, Ruhi, & Lakhani, 2018). Swan (2015) shows that smart contracts can be used for automating processes which run on top of blockchain. Even though blockchain systems are distributed and transparent, it is possible to ensure data privacy on blockchain systems. Zyskind, Nathan, and Pentland (2015) have shown that using permissions and a combination of on- and off-chain data a participant of a blockchain system can stay in control of their data.

Sultan et al. (2018) explain that blockchain systems can appear in three forms. Blockchains can be public, private, or hybrid. The public blockchain are visible by anyone and anyone can participate. On private blockchains, or also called permissioned blockchains, only privileged actors can read and write to the blockchain. In the hybrid blockchain, the system is public to a privileged group of actors. These actors are known and the blockchain is usually distributed between the known actors.

Sultan et al. (2018) summarize the four core characteristics of blockchain as immutable, decentralized, consensus driven, and transparent. The immutability refers to the permanent record of transactions, which cannot be altered. Decentralization refers to the distribution of the blockchain throughout the network. Consensus driven describes the fact, that every block added to the blockchain is verified and validated via a consensus model. Lastly, the transparency refers to the openness of the stored transactions. Any party part of the blockchain system can view the transactions.

2.2. Inter-Organizational Networks

Popp et al. (2014, p. 18) define inter-organizational networks as "three or more organizations are working together toward a common purpose". The organizations can be public or private, but Popp et al. (2014) observe that it is more common for public or non-profit organizations to engage in an IO network, since competitive organizations will collaborate more rarely to achieve a common purpose. Yet Park (1996) has

shown that IO networks can be used as a strategic move by entrepreneurs to enhance their competitiveness. These networks can be called "strategic networks" and are purposely and consciously arranged between organizations.

2.2.1. Structures of IO Networks

Types of collaborations prior to blockchain

The framework presented in this section dates from before the first blockchain based implementation, which is dated to the creation of Bitcoin in 2008 by Satoshi Nakamoto. The framework is used in this thesis to show the classic collaboration types between business organizations, before blockchain offered new collaboration possibilities.

Chi and Holsapple (2005) show that several frameworks aim to describe IO networks. Hong (2002) introduces one of these frameworks, which is meant for categorizing cooperation between business organizations. That framework has two dimensions, the first being the role linkage and the second system support level. The role linkage can be horizontal or vertical. Horizontal linkage means that the participants are homogenous in their business purpose, whereas vertical linkage goes across the value chain and the participants have a buyer-seller relationship. For the system support level Hong differentiates between operational and strategic support. With the strategic support the collaboration originates from the intention of pooling or sharing resources. Operational support means that the IO networks primary purpose is to support routine operations. Using these dimensions an IO network can be categorized to one of the four categories depicted below.
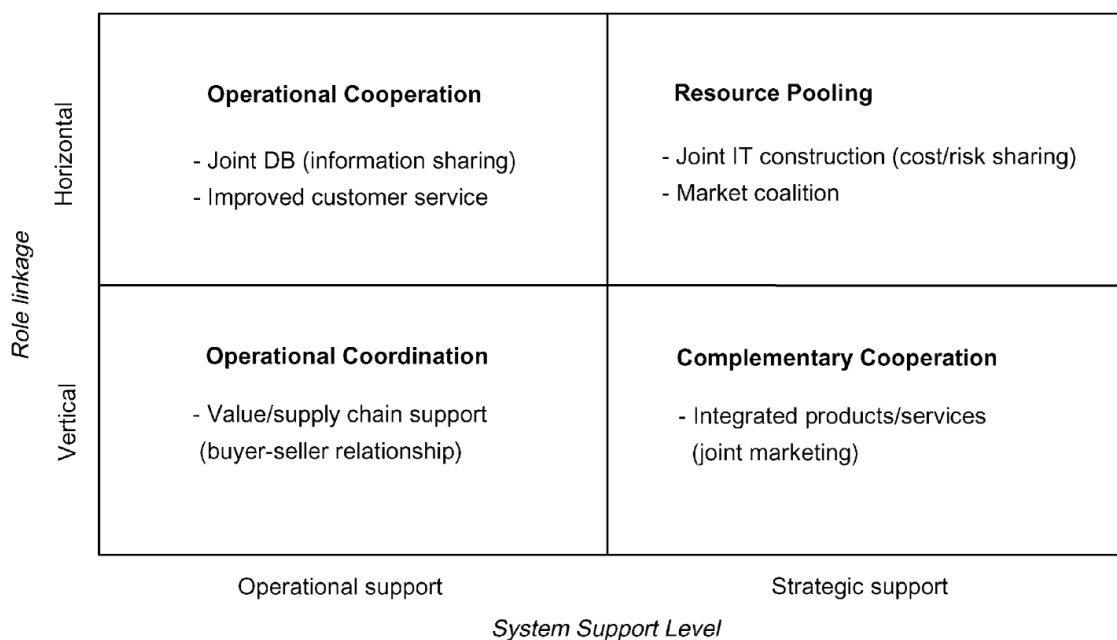

Figure 2: A framework for interorganizational systems from Hong 2002.

In resource pooling, organizations are connected to perform common value activities and enables risk- and cost-sharing. Complementary cooperation allows organizations in a value chain "to expand the business

capacity beyond the limit of the resources possessed by a single firm" (Hong, 2002, p. 265). Operational cooperation has the intention of improving the quality of customer service or to share information of common interest within a business segment. In an operational coordination, organizations cooperate to create better efficiency within their supply value chain.

Types of collaborators

As previously mentioned, Popp et al. (2014) have shown that participants in IO networks can be public or private and that collaborations between public and private organizations exist. For business organizations Park (1996) describes the participants to be entrepreneurs. Johnston and Vitale (1988) have seen that participants can be related by being customers, dealers, suppliers, or competitors. The framework by Hong (2002) which is presented above agrees with the notion of participants being either competitors or in a buyer-seller relationship. Williams (2005) observes that both larger and smaller firms can be represented in IO networks. Larger firms tend to try to use their power to reach their interests and smaller firms often hope to improve in their size by working with larger partners.

2.2.2. Motives and Opportunities

Chi and Holsapple (2005, p. 56) have created eight categories of motives for organizations to participate in IO networks. They say that organizations can have more than one motive to participate.

1) **The necessity motive** – an organization joins to "meet necessary legal, regulatory, or deregulatory requirements from higher authorities".

2) **The asymmetry motive** – an organization joins to exert power or control over other organizations.

3) **The reciprocity motive** – an organization joins "to pursue common or mutually beneficial goals or interests and to facilitate collaboration, trust building, and coordination".

4) **The efficiency motive** – an organization joins to improve both internal and inter organizational efficiency.

5) **The agility motive** – an organization joins to "increase agility and responsiveness to environmental changes".

6) **The innovation motive** – an organization joins for innovation and value creation purposes.

7) **The stability motive** – an organization joins "to reduce environmental uncertainty and to achieve stability, predictability, and dependability in its relations with others".

8) **The legitimacy motive** – an organization joins "to increase its legitimacy and reputation in order to appear in agreement with prevailing norms, beliefs, expectations of external constituents, or prevalence of a practice in the industry

Popp et al. (2014, p. 21) have listed benefits or motives to join an IO network as well. Below are motives, which were not included in the list of Chi and Holsapple.

9) **Access to and leveraging of resources** – an organization joins to access resources not held within their own organization and to stretch, build on or strengthen limited resources.

10) **Shared risk** – an organization joins to distribute risks between participants and reduce the risks for a single organization.

11) **Learning, capacity building** – an organization joins to exchange knowledge and enable learning and capacity building.

12) **Positive deviance** – an organization joins to think and act beyond their "norm, structure or mandate; to work deliberately in deviation from the standard organizational processes, overtly or covertly, to influence change in systems".

13) **Service quality** – an organization joins to "provide coordinated, higher quality services and a full continuum of care".

These motives will be used for a comparison to the motives of the cases studied.

2.2.3. Inner Dynamics

Inner dynamics are defined to be observations of situations, collaborations, or interactions resulting from interests, expectations, and motivations of participants. In this section the background is given for common dynamics.

2.2.3.1.　IO Network Early Life

According to Popp et al. (2014) an IO network goes through four stages 'formation', 'development and growth', 'maturity, sustainability and resilience', and 'death and transformation'. Within these stages it is common to observe dynamics resulting from interests, expectations, and motivations of participants. For the cases under study the first two stages are the most relevant since the cases usually are not very advanced yet.

Formation of an IO network

Popp et al. (2014) describe key activities which must be done when the network is formed.

a) The network needs to be designed to determine activities or tasks which must be done for an effective development of the network.

b) The evolving of network processes must be possible next to the development of the network structure.

c) Early in the network formation phase there is usually a party orchestrating to get people together, mobilizing them and framing the issue. They will also enable relations to be built and a culture to be developed.

d) A process described as 'sensemaking' is necessary, where a common understanding or meaning of information and language is developed. This is part of developing a common culture and narrative.

e) Flat structures and inclusiveness help finding consensus and to compromise.

f) It is not necessary to have complete agreement on how the problem is framed, more important is to involve all stakeholders.

g) Conferences or other pre-planned events can greatly improve the start of IO networks.

It is emphasized that spending time early in the development of the network is of high importance. This includes developing relationships, common understanding, and a narrative.

Development and growth

According to Popp et al. (2014) the development and growth of a network is facilitated by network managers. They need to work on the network structure, carry out essential management tasks and encourage distributed leadership. Managers of organizations which participate must balance the needs of the organization with the needs of the network. During this phase, the governance structure becomes more formalized, it is possible that the network becomes more hierarchical. Popp et al. (2014) have seen four themes which are important in this phase, being 'trust', 'power', 'positive deviance' and 'outcome attribution'.

Trust between the participants reduces friction and enhances the likelihood of positive collaborative outcomes. Trust is partly based on expectations of reciprocity. Usually good relationships between the participants mean that they trust each other. Trust also influences the willingness to count on a partner's reliability, behave predictably, and negotiate and act in good faith. It is reported that trust is crucial but also resource intensive.

Network managers often struggle with power imbalances in networks. Power can be used to facilitate or inhibit trust. By building resources or tactics for dealing with power imbalances, a collaboration is more likely to succeed. In case power imbalances exist, it is important to identify the source and uses of power to identify possible actions. Sources of power can result from formal authority, resources, or discursive legitimacy. Power can be exercised in three arenas: 'participant' meaning the individual who represents and organization, 'process design' meaning the influence taken when designing the collaboration process, and 'content' for example setting the agenda.

It is important for network managers to observe 'positive deviance' within the realm the network tries to establish themselves. The idea is that there will be other organizations or even organizations within the network which approach certain things in different ways, than the network as a whole would. If this is the case, the network managers should judge whether the deviating solutions improve reaching the goal they have and if so, adopt the solution. This means that managers should actively learn from the participating organizations to improve the network.

Lastly outcome attribution describes the situation, where results from the network should be shown, so that participating organizations feel confirmed in the purpose and progress of the network. Furthermore, the network managers must be careful when attributing successes to the network, whilst a single organization might have done the heavy lifting and feel discredited of their work.

2.2.3.2. IO Network Knowledge Sharing

Another key dynamic falls under the topic of knowledge sharing. In chapter 2.2.2. we have established that learning and sharing resources, including human capital, is an interest of participants to participate. Chi and Holsapple (2005) show that knowledge sharing improves collaboration by promoting understanding, suppressing opportunistic behaviors, and inducing commitment and trust among partners. They determine two factors with knowledge sharing: transparency and receptivity. Transparency describes the openness of an organization towards the partners, while receptivity refers to its ability to assimilate knowledge and skills from its partners.

2.2.3.3. IO Network Challenges

Popp et al. (2014, p. 24-25) have identified possible challenges when working as an IO network. The table 2 originates from their report. Most of the challenges will be commented on below.

Table 2: Some challenges to working in an inter-organizational network from Popp et al. 2014.

Challenge	Why it is a challenge	How it might be mitigated
Achieving consensus on and varied commitment to network purpose and goals	Member organizations come to the table with diverging perspectives and priorities, varying levels of trust in the process, and differing tolerance for subjugating individual needs in favor of the common goal.	- Use a participatory, collaborative process for establishing initial goals, making sure to involve key stakeholders and implementers. - Develop specific terms of reference for the goals of the collaboration. - Choose early activities that could change behavior first contributing to new norms and, ultimately, consensus.
Culture clash, or competing "institutional logics"	Member organizations have different ways of doing things (cultures) and/or institutional logics (e.g., approach to decision making, ways of providing services, transparency with partners), which can make it challenging to agree on essential structures, processes and outcomes.	- Identify and openly discuss the underlying cultures and logics of member organizations. - Develop structures and processes for the network that reflect a diversity of those found within member organizations.
Loss of autonomy	Legally autonomous organizations may resist coordinated decision-making, particularly when the decisions are not perceived as being in the best interests of their organization.	- Ensure that planning and decision-making is participatory and open. - Pay attention to how a potential decision could affect organizational members differently; highlight the potential gains.
Coordination fatigue and costs, including being pulled in multiple directions	Working collaboratively and coordinating decisions and activities take time and effort away from the day-to-day work of an organization. As well, it is not uncommon for a single organization to belong to multiple networks, which exacerbates the time and effort required.	- Adoption of an appropriate governance form and sufficient resourcing of the network can help ensure that the time individual member organizations commit to network activities is optimized. - Creating a network culture that allows members to engage at varying intensities on particular activities can also provide relief.
Developing trusting relationships	Trusting relationships take time to build, and must continue to be attended to if trust is to be maintained over time because reciprocity emerges from repeated interactions.	- Build trust initially by sharing non-threatening information or knowledge and engaging in low-risk activities, thus demonstrating competency, good intentions and follow-through. - Regular check-ins on the 'health' of network relationships may help identify and mitigate trouble. - Use the strategy of tit for tat; if someone cooperates with you in the first round, you cooperate with them in the next.

		- Cooperate with a non-cooperator occasionally as they may surprise you and cooperate.
Obstacles to performance and accountability	Accountability can be a particularly complex issue, as it is often not clear to whom the network is accountable and for what. This diffusion of accountability can lead to "free-riders", where some organizations participate minimally and let others pick up the slack.	- Establish an early expectation that all network members will contribute in some fashion over time, setting the stage for network members to hold each other accountable. - Tracking inputs and creating transparency within the network can also make individual member contributions and corresponding outcomes more visible and provide evidence for tough conversations with "free-riders."
Management complexity	Management within a network context requires managing across organizations as well as within the traditional hierarchical structures of member organizations. Tensions that arise between the two are typically difficult to resolve but still require confronting.	- Acquire and share knowledge within the network about how networks operate. - Identify how each organization fits into the network and predict the tensions that may arise. - Ensure good conflict resolution mechanisms are in place to address issues in an open and transparent way. - Foreshadow the fact that some tensions may be irresolvable and that this is acceptable within the network culture.
Power imbalance and resulting conflict	As in life, organizational members come into the network with differing levels of status and resources, making power imbalances a reality.	- Use language that reinforces equality among members. - Provide early and ongoing assurance that the interests of all members are being considered. - Use resources to mitigate power imbalances and manage conflict effectively.
Lack of organizational capacity to work collaboratively	Organizational members may lack experience working collaboratively because of traditional organizational ways of working.	- Work to develop the network culture or a compelling narrative such as the 'network way of working.' - Provide education on collaboration to network members. - Choose an early activity to work together on that has good potential for a quick win. - Model a collaborative leadership style.
Sustainability	Sustaining a network can be challenging for a number of reasons, many of which have been discussed throughout this table. An additional challenge to network sustainability is change in the environment within which a network operates, or the network moving to a new evolutionary stage of development.	- Be aware of the common challenges experienced by networks, mitigating them where possible. - Ensure the network remains nimble by trying to anticipate and respond/adapt to changes in context. - Promote network level learning. - Institutionalize network structures and processes to encourage stability.

The possible mitigations to the challenge 'achieving consensus on and varied commitment to network purpose and goals' have also been referenced in chapter 2.2.3.1. To mitigate this challenge, it is important to manage the network properly during its formation. The 'culture clash' challenge is related in the sense, that the best mitigation is to observe the difficulty during the formation. For 'coordination fatigue and costs, including being pulled in multiple directions' the emphasis is on the situation where employees work on tasks for the IO network, but still have a day-to-day job in parallel. This causes strain and is best mitigated by committing sufficient resources in form of manpower to the IO network or the day-to-day job. The potential rise of the challenges 'obstacles to performance and accountability' and 'power imbalance and resulting conflict' were shown in 2.2.3.1. as well.

2.3. Stakeholder Analysis

2.3.1. Overview

Besides providing a literature background to stakeholder analysis, this subchapter simultaneously answers RQ0 and the knowledge is used in the methodology chapter. Reed et al. (2009) describe that stakeholder analyses is usually used as a management tool to understand all stakeholders which are affected by a decision. Their definition of a stakeholder analysis process has three components:

a) A process that "defines aspects of a social and natural phenomenon affected by a decision or action".
b) A process that "identifies individuals, groups and organizations who are affected by or can affect those parts of the phenomenon (this may include nonhuman and non-living entities and future generations)".
c) A process that "prioritizes these individuals and groups for involvement in the decision-making process".

Reed et al. (2009) have developed an illustration of different possible stakeholder analyses, which will be explained below.
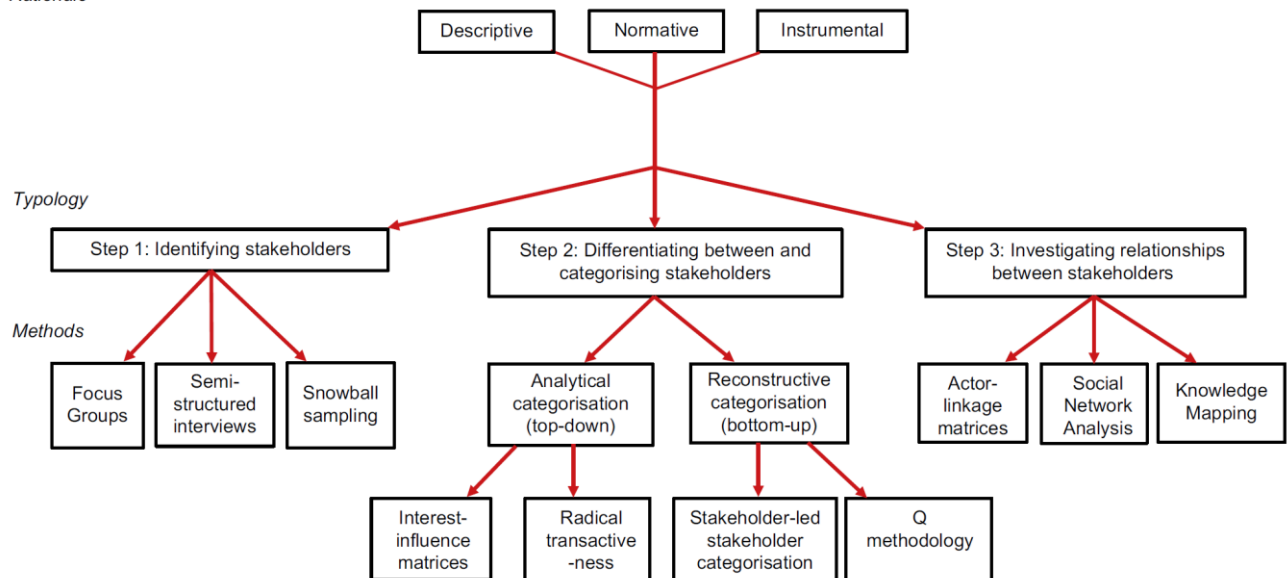
Rationale

Figure 3: Schematic representation of rationale, typology and methods for stakeholder analysis from Reed et al. 2009

The 'rationale' level describes the motivation to do a stakeholder analysis. The 'normative' stakeholder theory is used to "identify who decision-makers are morally responsible to in their legal and institutional context" (Reed et al., 2009, p. 1935). The 'instrumental' stakeholder analysis describes the usage of a stakeholder analysis as a tool by organizations, projects, and policymakers to identify, explain, and manage the behavior of stakeholders to achieve desired outcomes. The 'descriptive' stakeholder analysis is about describing relationships between a phenomenon and its stakeholders. The descriptive stakeholder analysis is a prerequisite of the normative and instrumental analysis, since both require an understanding of the current state of affairs, which is provided by the descriptive analysis.

On the 'typology' level the three steps of the stakeholder analysis are shown. First being identification of the stakeholder, second 'differentiating between and categorizing stakeholders' and third 'investigating relationships between stakeholders'. The third step is mostly relevant for normative and instrumental analyses. Every step has several typical possible methods.

According to Reed et al. (2009) the identification of stakeholders is easier when the boundaries of the phenomenon are defined. Often the relevant stakeholders are identified top-down by the entity conducting the stakeholder analysis. 'Focus groups' identify stakeholders by brainstorming and judging the interests, influence and other attributes of the stakeholders. 'Semi-structured interviews' are done with the stakeholders, often to check or supplement results from the focus group. In 'snow-ball sampling' stakeholders are interviewed to identify further stakeholders they might be aware of.

The second step is split in two methodology classes. The 'analytical categorization' is done top-down by the entities conducting the analysis, whereas the 'reconstructive categorization' is a bottom-up approach where categorizations and parameters of stakeholders are defined by the stakeholders themselves. For the top-down

approach a popular method of categorizing stakeholders is the 'interest-influence matrices', where stakeholders are placed in matrix judged by the strength of their interests and their influence. 'Radical transactiveness' is done by identifying stakeholders through snow-ball sampling, then developing strategies to address their concerns. The advantage of the bottom-up approach is that the categorization of the stakeholders better reflects the views of the stakeholders analyzed. Proposed methods are 'stakeholder-led stakeholder categorization' where the categorization is done by stakeholders themselves or the 'Q methodology' where "stakeholders sort statements […] according to how much they agree with them" (Reed et al., 2009, p. 1937).

A simple method for displaying relations between stakeholders in stage three, is by creating 'actor-linkage matrices'. All stakeholders are put in a row and a column to form a grid, then codes are given to describe the relation between stakeholders. The 'social network analysis' is more complex and is "used to identify the network of stakeholders and measuring relational ties between stakeholders through use of structured interview / questionnaire" (Reed et al., 2009, p. 1937). The 'measuring relational ties' requires quantifying relations and needs a focused gathering of data. Lastly, 'knowledge mapping' is used with social network analysis and is about identifying interactions and knowledges.

2.3.2. Alignment, Interest and Influence Matrix

The alignment, interest and influence matrix (AIIM) by Mendizabal (2010) is an extension of the interest influence matrix introduced earlier. AIIM has the additional dimension of including the alignment of the interests of a stakeholder usually towards the entity doing the stakeholder analysis. The alignment can be signaled by the color a stakeholder has in the matrix, see the example below.
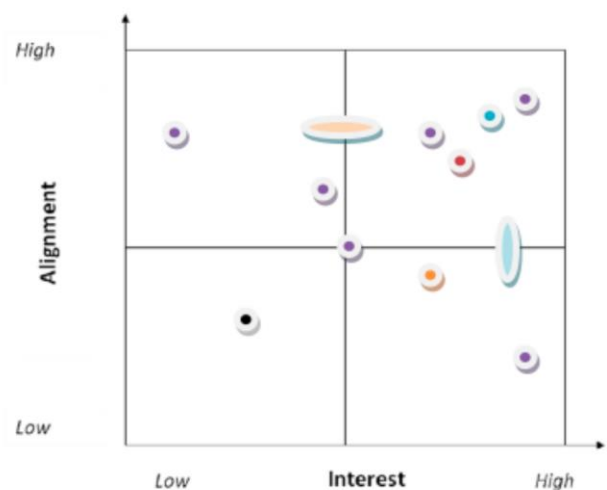

Figure 4: An example AIIM by Mendizabal 2010.

3. Methodology

To arrive at robust analytical results a literature search is performed (chapter 2, 3.1), a systematic analysis of stakeholders and their collaboration (chapter 3.2, 3.3.) by performing a qualitative data analysis (chapter 3.4).

3.1. Literature Search

The literature search was used for providing a literature background in chapter 2 and defining the optimal methodology for this thesis. It was performed by defining key words in English which were searched using the google scholar search engine. The key words were related to at least one of the three topics being blockchain, inter-organizational networks, and stakeholder analysis. To broaden the results synonyms have been used as well. Additional literature has been provided by the advisors. References to sources in informative papers were used when the sources promised further relevant information. A selection of search terms used can be found below.

Blockchain:

- Blockchain characteristics
- Collaboration using blockchain
- Permissioned blockchain

Inter   organizational   networks:
Synonyms: inter organizational collaboration, inter organizational systems

- Inter organizational networks
- Inter organizational networks dynamics
- Inter organizational networks governance
- Inter organizational networks roles
- Inter organizational networks participants

Stakeholder analysis:

- Stakeholder analysis methods
- Stakeholder analysis framework
- Stakeholder identification
- Stakeholder analysis guide

3.2. Interview Data

The data used for this analysis came in the form of transcribed interviews with individuals representing their organization in a blockchain consortium. The interviews are semi structured and follow a guide which is included in the appendix A. The interviewees shared information on topics listed below and more.

Interviewees often additionally explained how the consortium came together and established the collaboration in the first place. The interview data was provided by the IMRG.

1) **Introducing the consortium** and **why blockchain** is used.

2) Description of the consortiums **business models.**

3) **Why collaborate as a consortium**.

4) **Interests of the interviewees' organization**.

5) How the technology is developed. (**Who develops, how are requirements set**, …)

6) The handling of data.

7) **Challenges originating in the usage of blockchain**.

8) Collaboration and governance.

    a. **Decision taking**

    b. **Distribution of work**

    c. **Communication and coordination**

9) **Influence of blockchain on collaboration**.

10) External influences on the consortium.

11) How the **collaboration between competitors** is managed.

12) Ownership of the consortiums' IP.

13) Legal and compliance challenges.

14) **Most remarkable moment**.

15) **Biggest achievement of the consortium**.

16) **Biggest challenges currently faced by the consortium**.

17) **What would they do differently if they could turn back time.**

18) **Crucial success factors for blockchain consortia.**

19) **Specific challenges or threats to blockchain consortia.**

Resulting from the interview guide and a sample reading of interviews a sheet was prepared with data fields, which are expected to be filled with interview data for individuals, roles, and the consortium. The sheet can be viewed in appendix 2. Since it has been done at an early stage of the study, the expectations are off from what the interviews truly have to offer, and the focus has shifted partly due to the available content.

3.3.　Case Analysis Framework

The stakeholder analysis consists of two parts. First a framework is created, which is used for displaying the information found in the data. In the second part the data is analyzed by doing a qualitative data analysis. In this section the framework is presented, which is used for a standardized depiction of the cases. The design of the framework is influenced by literature related to conducting stakeholder analyses and since the data used for the analysis is given and cannot be changed, the framework is also fitted towards the data provided.

Additionally, considering that the goals of the stakeholder analysis are to study stakeholder interests and dynamics of blockchain consortium and not do the preliminary work of a decision taking process, this analysis does not include all three steps of a stakeholder analysis presented in the literature. It includes step one, two and a system designed to identify dynamics, fitted towards the data provided. Stakeholder analyses for decision taking purposes would usually require step one to three to be done.

3.3.1. Identifying Stakeholders

As suggested by literature, the first step in a stakeholder analysis is to identify the stakeholders. In this study we limit the stakeholders to the participants of the cases under study. The underlying data are semi-structured interviews, which is a method supported by literature. Since RQ1 and 2 are about finding interests, expectations and motivations, frameworks which include stakeholder interests are of relevance. The AIIM framework provides a model where the consortium can be the 'interest compass' to which the stakeholders are compared to. Those design principles of identifying the interests of the consortium and of the participants is used for the framework of this study. Since this study has insufficient data to determine the influence of stakeholders, the goal is not to take a decision based on the stakeholder analysis and the fact that not all participants of a consortium are well understood, the AIIM as introduced by the ODI is not optimal for this use case. The resulting framework consists of standardized table which introduces the consortium, followed by standardized tables displaying the stakeholders. A detailed description is found in chapter 3.3.3.

3.3.2. Identifying inner Dynamics

The identification of inner dynamics does not follow the models from literature but results from the data, which is a more bottom-up approach where stakeholders report on their collaborations, challenges, and solutions. Due to the wide possible range of dynamics, the framework must be open to all sorts of observations. From literature it is known that big categories of dynamics are in the collaboration, decision taking and governance. Plus, it is known that in all three areas there are challenges. To allow the wide range of possible answers to be observed, the data collection process was designed in a way to allow a wide range of observations to be done. More details on how the data is collected is in chapter 3.4. After the collection of data is done, the dynamics reported by all interviewees of a case are consolidated and presented in the results.

3.3.3. Framework for the Results

Every case will be shown in the results chapter using the schematic introduced below. The description of the consortium and of the stakeholders has been standardized and displayed as a table for a better readability. The dynamics are discussed by topics. In a first step the case is introduced using the following table. The goal is to explain the purpose of the consortium, show the size, the data received, and the interests and motivations.

Table 3: The framework for identifying a consortium. Own representation.

Cxx – Given name of consortium	
Description	
Description of the consortium. Generally, the use case is explained including the issue the consortium was created for to solve and how they intend to solve it.	
Why Blockchain?	
This section explains why blockchain is used in the consortium. Arguments usually are based in the specific benefits blockchain has to offer and motivations of the participants.	
Members	**Interviewees**
An anonymized list of members. Example: 1 Technological partner 5 Business partners	The number of interviews available within this consortium and the partners interviewed.
Interests and Expectations	**Motivations**
A list of interests and expectations, which the participants usually agreed upon.	The underlying motivations of the interests and expectations listed on the left.

Secondly the members of the consortium are introduced. For smaller consortia, each member with sufficient information is presented including their interests, expectations, and motivations. If the members are homogenous in their purpose, they are summarized as a role and not represented as a single organization. Any organization theoretically part of the role, but with diverging interests gets its own table. Stakeholders can have several interest areas. Example areas are operational interests, which are interests originating in the members business operations or collaboration interests, which describes interests towards the collaboration in the consortium. The standardized table is set up as follows:

Table 4: The framework for identifying a stakeholder. Own representation.

Description: Describes the member	**Type:** Declares whether this table describes a role or an organization
Roles: Overview of the roles the member has in the consortium	
This part describes the member usually mentioning their purpose, motivation and why they have the roles assigned above.	
Interests and Expectations	**Motivations**
First interest area (e.g. Operational Interests)	
A list of interests and expectations in the interest area shown.	The underlying motivations of the interests and expectations listed on the left.
Second interest area (e.g. Collaboration Interests)	
A list of interests and expectations in the interest area shown.	The underlying motivations of the interests and expectations listed on the left.

In the third and final section for every consortium, the dynamics within the consortium are discussed. The first topic within that section is always 'Influence of Blockchain on inner dynamics'. The other topics are fully dependent of the data the interviews provide. The topics presented help answer RQ3.

3.4. Qualitative Data Analysis

The data for this research comes in the form of transcribed semi structured interviews done with participants of the consortia under study. To prepare the data for further analysis, the interviews are dissected by coding the texts. The initial creation of the codes is a result of best practices from literature, the expected data, which is listed in appendix 2, and the framework for the stakeholder analysis introduced above. During the process of coding the interviews, the codes have been slightly adjusted to better fit the interview data.

The codebook is created before the coding started and is designed in such a way that the codes can absorb the expected data shown in appendix 2. In appendix 3 the codebook is included, which was used when the coding started. The final version of the codes used changed slightly during the coding process and the lists below introduce the final version of the codes and subcodes, which were used for every interview. The three sections represent the different type of code classes. The code classes originate mostly from the data and the research purpose. In the first class all involved entities are depicted (stakeholders and the consortium itself). The second class is about relations between the entities and the third is used for the usage and effects of blockchain in the consortium.

Entities

- Stakeholders
  - Cxx_S01
  - Cxx_S02
  - Cxx_S03
  - …
  - Cxx_S18
  - Cxx_S_others
  - general_interests
- Consortium
  - Cxx_founding
  - Cxx_orga-collab
  - Cxx_business_model
  - Cxx_identity
  - Cxx_interests

Relations

- Dynamic
  - solutions
  - mistakes
  - challenges
  - decision_taking
- Relation

Blockchain

- Blockchain
  - blockchain_why
  - blockchain_on-chain
  - blockchain_implications

The Cxx stands for the case ID. Each stakeholder receives their own code (e.g. Cxx_S01). For each stakeholder their identity, interests, expectations, and motivations are coded using their assigned code. The Cxx_S01 code purposely does not have any subcodes, because that would bloat the number of codes and the overview of a stakeholder was not impaired by mixing identity, interests, etc. Under Cxx_S_others all stakeholders are collected, which are mentioned but only little information is available about them. 'general_interests' is used for interests which are present for all or most stakeholders.

The consortium has codes for the founding of the consortium, how the organization and collaboration structure is set up, what the business model of the consortium is, information regarding their identity (e.g. legal form), and the interests, expectations, and motivations. The goal is to understand and later introduce the consortium in the results. The codes regarding the identity of the stakeholders and consortia results from the literature on stakeholder analysis. Interests, expectations, and motivations are related to the research questions and the framework introduced in chapter 3.3.3.

The code class 'relations' incapsulates the dynamics and relation. The code dynamics is used to identify inner dynamics, understand why it affects the IO network and what can be done about it. Dynamics has the subcodes challenges, which is used for all challenges within the consortium. Mistakes refers to situations which were mishandled in the consortium. The difference to challenges is, that mistakes are in the past and often a regret, whereas challenges are a difficulty which should be overcome. Solutions are either solutions to challenges or situations which just went well. Decision_taking refers to the decision taking process. If an observed dynamic does not fit one of the classes it is not assigned to a subcode, but the code 'dynamic'. The relation code is used to code relations between stakeholders, e.g. "stakeholder 1 and 2 have collaborated before working on this blockchain solution".

Lastly the blockchain code is used to understand why blockchain is used, what are the benefits. Also, to determine the data put on the blockchain and any implications from using blockchain, which is related to the dynamics code.

4. Results

Chapters 4.1 to 4.19 provide a succinct summary of each of the 19 consortia and of the stakeholders, based on 53 semi-structured interviews. Chapter 4.20 summarizes the results.

4.1. C01 - Data Market for the Car Eco-System

4.1.1. Description of the Consortium

The following table introduces the consortium "C01 – Data market for the car eco-system". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 5: The description of C01. Own representation.

C01 - Data market for the car eco-system	
Description	
This IO-network came together to improve data sharing and trust in the car eco system. Currently the issue is that actors in the car eco-system have a lot of data, but do not share it with other actors. The consortium hopes that a data market based on blockchain can improve the data transmission and distribution.	
Why Blockchain?	
Create trust and transparency in the eco-system, by having a single point of truth. Enable sharing of data between organizations. Counter forged documents through digitization. Members are interested in trying out the technology.	
Members	**Interviewees**
1 Technological partner	01 – Academic partner 1
15 Business partners or associations	02 – Business partner - Insurance
4 Regulators	03 – Regulator
2 Academic partners	04 – Technological partner
Interests and Expectations	**Motivations**
- Build a data market for cars related data. - Efficiency gains through better data. - Increase trust in the eco system. - Non-profit platform. - Gain Blockchain experience.	- Improve market efficiency. - The regulator is non-profit. - Understand the hype around blockchain.

4.1.2. Stakeholders Interests, Expectations, and Motivations

This consortium has a wide range of actors participating. Only few partners are well represented in the interviews, which is why the future users of the platform are presented within the role "Data market users". There is more information from the insurance company and of the department for motor vehicles, which are presented in detail. Table 6 describes the technological partner, table 7 an academic partner, table 8 the data market users, table 9 an insurance company and table 10 the department of motor vehicles.

Table 6: Description of the technological partner from C01. Own representation.

Description: Technological Partner	Type: Organization
Roles: Development, co-initiator, project lead	
The technological partner co-initiated the project with an employee of the academic partner 1. In the consortium they acted as project lead and as developing lead. Their interests are to gain experience with blockchain by developing the platform and to resell the underlying technology to other eco-systems in the future.	
Interests and Expectations	**Motivations**
Business interests:	
- Develop the platform. - Run the platform, license it, and resell the underlying technology to other use cases. - To have showcase projects.	- Develop their skills. - Financial gains. - To market themselves.
Technological interest:	
- Interested in developing skills in blockchain, machine learning, artificial intelligence.	- Create business opportunities and promote innovation.
Collaboration interest:	
- To create a fair platform for all users and not give themselves too much power.	- The priority is to get the platform to run and to have partners who are happy to use the platform.

Table 7: Description of the academic partner 1 from C01. Own representation.

Description: Academic partner 1	Type: Organization
Roles: Business analysts, co-initiator, co-development	
The academic partner supports the project by acting as a business analyst, supporting developing partner, and helping to find possible business models. Their academic interest is to understand governance of consortia which work with blockchain.	
Interests and Expectations	**Motivations**
Academic interests:	
- Interested in how competitors collaborate in a consortium. - Interested in blockchain usage for collaboration. - Not interested in signing NDAs. - To find consensus with project members on contents of publications.	- To publish papers in these areas. - To be a leading research group in blockchain and governance.

Table 8: Description of the data market users from C01. Own representation.

Description: Data market users	Type: Role
Roles: Experts of their domain, User of the platform	
This role consolidates the general interests of the partners who joined to trade data on the data market. The data buyers' interest is to get access to data from other organizations, to improve their services. The sellers' interest is to get a financial compensation for providing the data.	
Following organizations are part of this role: insurance companies, car manufacturers, car importers, car dealers and mechanics, car rentals and leasers, online car marketplaces, and the department of motor vehicles. Some of these roles are represented by associations and others represent themselves.	
Interests and Expectations	**Motivations**
Business interests:	
- To buy data or - To sell data. - To improve processes. - To create new business models. - High interest in onboarding all organizations in the eco-system.	- To improve their processes. - Financial gains. - Cost reduction and better services for the customers. - Opportunity for financial gains. - The market only fulfills its potential when most of the organizations in the eco-system join the platform.

Description: Insurance company	Type: Organization
Roles: Car insurance expert, User of the platform	
The car insurer is part of the "Data market user" role. They would be mostly buying data to have better information on the cars they insure, to offer the optimal policy price to their customer.	
Interests and Expectations	**Motivations**
Business interests:	
- To have more, higher quality, and structured data. - To improve processes. - To onboard partners (strong interest). - Expects in the future that sensor data will be traded.	- To create personalized offerings of insurance policies. - Cost reduction and better services for customers. - They profit the most when all possible actors are on the market. - Quality improvement of the data.
Collaboration interests:	
- Expects of every partner to help with the onboarding of partners. - Interested in contributing to the platform.	- This task is critical for the success of the platform. - To have a head start to other insurance companies who are not yet on the platform. And due to sunk costs of investing for two years in the platform.

Table 10: Description of the department of motor vehicles from C01. Own representation.

Description: Department of motor vehicles	Type: Organization
Roles: Regulator, User of the platform	
The department of motor vehicles is interested in having a better access to data, to improve their internal processes. As a governmental agency, they are not allowed to be part of organizations which work for profit. They are part of the "Data market user" role.	
Interests and Expectations	**Motivations**
Operational interests:	
- Increase the quality, quantity, and access of data. - Improve processes through digitization. - Strong interest in reducing operational costs. - To stay up to date with changes to vehicles.	- To better judge which cars must be called in for a checkup. - Data is handled manually and prone to human error. - Budgetary cuts are made. - They need to know the specifications of vehicles and nowadays vehicles behavior can change through software updates.
Collaboration interests:	

- Interested in participating in the consortium, instead of enforcing the data transfer by law. - Interested in the consortium being non-profit.	- There is no guarantee that such a law could pass and to set up laws is a slow process. - Governmental agencies may not involve themselves in organizations for profit.

4.1.3. Dynamics within the Consortium

Influence of blockchain on inner dynamics

Interviewee 04 thinks that blockchain does not influence how collaboration is done. The collaboration is much rather influenced by its startup character.

Number of partners

Interviewee 04 thinks that the partners in the consortium have been the right ones from the start. The partners are important actors in their field and for the eco-system. Also being seven partners at the start was not too many nor too few, which helps to get the project going.

Decision taking

The governance of this consortium has several entities. There are regular meetings for coordination, feedback, and other smaller decisions where most on the project can join. Then there is also a steering committee for strategic decisions. In principle the consortium follows a democratic approach. Often there are experts who give a recommendation on how an issue should be solved and usually their suggestion gets accepted.

Collaboration difficulties

The consortium consists of heterogenous members, which creates some friction. It is difficult to create a common vision. The academic partner recognizes that they are slower than the industry partners. As a solution they think that a better alignment and transfer of knowledge would help. Another source of friction is that not all partners contribute equally in terms of output and responsibility. Interviewee 04 reports that there is a tendency of subcultures to form, which is dangerous and needs to be corrected when it becomes evident.

Internal communication

The internal communication is reported to not work efficiently. Messages not being answered, lawyers not agreeing on the word choice, pointless discussions wasting time, last minute requests and many more. It seemed to be difficult to ensure that everybody is informed, partly because people had other jobs to attend to.

Missing network effect

Since the consortium relies on network effects for it to succeed and the network is not big enough yet, there are some challenges resulting from it. For one the members are forced to have trust and invest in the success of the system, even though there is no business value yet. The members are being reminded of the business potential of this collaboration and that the investment is worth it.

Another challenge is that potential partners hesitate to onboard, because if the network effect is not there yet, there is no business value yet of being part of the platform. The consortium tries to onboard partners by having relations to associations and politics.

4.2. C02 - OTC trading platform

4.2.1. Description of the Consortium

The following table introduces the consortium "C02 – OTC trading platform". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 11: The description of C02. Own representation.

C02 – OTC trading platform	
Description	
This IO-network came together to gain experience building a solution based on blockchain. The solution should become a trading platform for over the counter (OTC) securities, which is automated and trustful. Members had different interests whether the solution should become a live system or whether the project should end with the building of the prototype. The lack of consensus and poor choice of partners lead the project to fail.	
Why Blockchain?	
Gain experience with the technology since it is hyped. Blockchain is a good reason for organizations to come together and merge resources. Blockchain enables collaboration between competitors. No central entity, which improves trust and high security.	
Members	**Interviewees**
3 Technological partners	01 – Leading technological partner firm
2 Business partners	02 – Business partner – Bank
1 Academic partner	03 – Leading technological partner firm
Interests and Expectations	**Motivations**
- Build a new trading platform. - Optimize the current process. - Gain Blockchain experience.	- Financial gains. - Efficiency gains. - Fit for future.

4.2.2. Stakeholders Interests, Expectations, and Motivations

All three technological partners are interested in doing development. Table 12 to 14 introduce the technological partners 1-3. Table 15 introduces the academic partner, table 16 the bank and table 17 the market access provider.

Description: Technological partner 1	Type: Organization
Roles: Initiator, Development	

Claims to be the initiator of the consortium. They want to position themselves as a solution provider for banks in the fintech industry. They identify themselves as innovative and were actively looking for use cases around blockchain for the financial industry.

They provided the most resources for the development and had more experience and knowledge in the blockchain area than the other technological partners. Interviewees 01 and 03 worked for this organization.

Interests and Expectations	Motivations
Business interests:	
- Position themselves as solution provider towards banks in the fintech industry. - To develop and run the infrastructure. - Become the application management partner for this solution. - Not interested in teaching competitors.	- Financial gains and company growth. - Sharpen their blockchain skills. - They know how to write smart contracts and can provide their services this way. - They compete with their competitors.
Technological interest:	
- Want to be the first ones to be active on blockchain. - Ready to commit resources and reputation to the topic.	- Leader in building blockchain solutions.
Collaboration interests:	

- Include a competitor in the consortium.
- Expected that the university of applied sciences provide the academical lead. Including:
  o What are current developments in blockchain?
  o What does the future of blockchain promise?
	- This organization may not have monopolies.
	- They want guidance on where the blockchain journey is heading.

Table 13: Description of the technological partner 2 from C02. Own representation.

Description: Technological partner 2	Type: Organization
Roles: Infrastructure partner	
They are an IT solution provider for banks. Have experience in Ethereum. More of an infrastructure partner than developer.	
Interests and Expectations	**Motivations**
Business interests:	
- Run the infrastructure for the solution.	- Financial gains.

Table 14: Description of the technological partner 3 from C02. Own representation.

Description: Technological partner 3	Type: Organization
Roles: Co-development	
Developed the platform with "Technological partner 1".	
Interests and Expectations	**Motivations**
Business interests:	
- Run the infrastructure for the solution.	- Financial gains.

Table 15: Description of the academic partner from C02. Own representation.

Description: Academic partner	Type: Organization
Roles: Project management	
They did the project management, applied for funding from the government, did marketing, and managed the financial resources. The university provided a neutral ground for all participants to come together. This helped for competitors to come together. Some stakeholders believe that the university of applied sciences initiated the project.	
Interests and Expectations	**Motivations**
Academic interests:	
- Learn about blockchain solutions for the financial sector.	- Publish papers.

Table 16: Description of the bank from C02. Own representation.

Description: Bank	Type: Organization
Roles: Banking expert, end user	
The bank represents the potential end user of the platform. They drove the functional requirements of the system. The consortium tries to optimize a business segment which is relatively small for the bank. The potential optimization the solution promises only outweighs the production cost minimally. Therefor the motivation to get the platform to run is weak, and the project is viewed strictly as a research project or prototype. There are no intentions in integrating the platform to their systems.	
Interests and Expectations	**Motivations**
Business interests:	
- No strong financial interests. - Process optimization (weak interest)	- The bank has little activity in this business sector. The cost of optimizing the process hardly outweighs the benefits.
Technological interest:	
- Learn about blockchain. - Understand what the integration of such a platform would mean for the bank.	- Gain experience and insights in blockchain. - Prepare for future developments.
Consortium	
- Expects a prototype to be built.	- Wants to demonstrate the solution to other banks.

Table 17: Description of the market access provider from C02. Own representation.

Description: Market access provider	Type: Organization
Roles: Market expert	
The organization which runs a financial market is simultaneously a big developer for financial infrastructure and therefor active in the IT side of financial transactions. Their role was to provide input from the business side. They are strongly interested in a solution for digitizing financial trades. Nonetheless they were only half-heartedly invested in this consortium.	
They ended up pulling out of the consortium to create a comparable platform by themselves. The consortium dissolved after this event. Some participants claim that this organization got significantly more out of the consortium than all other participants.	
Interests and Expectations	**Motivations**
Business interests:	
- Develop and run the infrastructure for the solution. - Position themselves as solution provider towards banks in the fintech industry.	- Financial gains and company growth.

- Interested in owning the trading platform by themselves.	

4.2.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Blockchain acts as a catalyst to start such a consortium. Reason being, that organizations want to be part of the hype surrounding blockchain. Therefor they are interested in participating and committing resources. Simultaneously this can be a danger, since consortium can be founded with blockchain being used as "a solution looking for a problem" instead of "a problem looking for a solution".

Consortium setup

The initiating technological partner was interested in having other TPs in the project, to avoid monopolist structures. TP 2 and 3 ended up being less experienced than TP 1 and were not able to contribute to the development as much as TP 1 did. Furthermore, TP 1 disliked this relationship since they felt like they were training a competitor.

Following observations have been done by the interviewees:

- "Cooperation with too many partners who bring in the same skills is very difficult." Especially when they want to occupy the same role in the consortium.
- Collaboration with competitors is difficult, especially when the members try to hide information between each other.

The interviewees suggest that following topics should be considered when choosing the partners:

- Do we want to build something together?
- Do we want to go to market together?
- Define the distribution of tasks, costs, and earnings.
- Do we want to include the end user in the consortium?
- Everybody owns all the IP, which improves unity and reduces friction.

The interviewees agree that having a third party like an academic partner acting as project lead is great for competitors to come together and have a middle ground.

Common vision

One of the reasons for this consortium to fail was the fact, that the members had differing interests and expectations regarding the desired outcome of this collaboration. While TP 1 was interested in getting the platform live, the bank viewed this project strictly as a learning experience and was not motivated in have a functioning platform. Also, the understanding is that the stock market access provider was interested in owning such a solution and not having to share ownership with others.

The interviewees suggest that when the collaboration starts, more time should be spent talking to each other. As a result, these issues should be taken care of in a better way:

- Understand the interests of each partner.
- Understand the mentality of the participants coming from different sectors.
- Build trust with each partner for good relationships and unity.
- Agree on a shared vision from the beginning including the end goal and the path towards that goal to be strategically aligned.
- Common understanding of the vocabulary used. Example: What contains the prototype? What contains the MVP?

Other ideas were to put more skin in the game and create a startup. By doing so the pressure to succeed would be higher and all participants would be motivated to give their best.

4.3. C03 – Land Registry

4.3.1. Description of the Collaboration

The following table introduces the collaboration "C03 – Land Registry". The table contains a brief description of the collaboration, the problem the collaboration is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the collaboration.

Table 18: The description of C03. Own representation.

C03 – Land Registry	
Description	
This IO-network differs in the collaboration from the classic consortium. The governmental agency acts as a client towards the technological partner, who exchanged the solution for better relations with the state and publicity. The governmental agency also employs legal advisors to have a smart legal framework around a blockchain land registry. The land registry is put on a blockchain to improve E-Governance and trust.	
Why Blockchain?	
Data safety and immutability. Fix trust issues citizens have towards the government and provide legal security. Automation of the process.	
Members	**Interviewees**
1 Technological partner 1 Governmental agency 1 Legal consultancy	01 – Governmental employee 02 – Legal consultancy 03 – Technological partner 04 – Legal consultancy
Interests and Expectations	**Motivations**
- E-governance - Trustworthy and safe systems - Compatible legal framework	- Innovation and automation - Hackproof, anti-corruption, and acceptance by citizens. Citizen trust used to be low. - Fair rulings in court.

4.3.2. Stakeholders Interests, Expectations, and Motivations

Table 19 introduces the governmental agency, table 20 the technological partner and table 21 the legal consultancy.

Table 19: Description of the governmental agency from C03. Own representation.

Description: Governmental Agency	Type: Organization
Roles: Client of the technological partner and the legal consultants	
The governmental agency acts as a client in this collaboration. They will run and own the platform once it is built. The country develops fast, IT infrastructure is improving quickly and on a high level.	
Interests and Expectations	**Motivations**
Governmental interests:	
- To be innovative, digitalize systems, have simple governmental processes. Have E-Governance in place. - Fight corruption. - High level of security for the data. - No strong interests in data privacy. -	- To be fit for future and efficient. - Improve the business environment. Improve trust from citizens, which used to be low. - Withstand cyber-attacks. - Data privacy is not a concern in this culture.
Collaboration:	
- Partners should be reputable. - The solution should be able to run independently of the technological partner.	- Reduce risks. - If the tech. partner must be replaced, it is possible.

Table 20: Description of the technological partner from C03. Own representation.

Description: Technological Partner	Type: Organization
Roles: Develop the solution	
The technological partner developed the solution for free, to improve relations with the government and for publicity. They also advised how the business model should be done for best compatibility with blockchain. It is said that this partner is the largest blockchain software and hardware company with experience in the blockchain field.	
Interests and Expectations	**Motivations**
Business interests:	
- Strong interests in the blockchain technology and want to be a leading partner in the world of blockchain. - Interested in improving relations with the local government. - Interested in setting up server farms in the client country. - Publicity through this project.	- Blockchain is their business sector and they believe in its potential. They want to improve their position on the market. - Interested in setting up server farms in the client country. - Profit of the cheap energy prices. - Financial gains.

Description: Legal Consultancy	Type: Organization
Roles: Advise the governmental agency on the ideal legal framework	
The legal consultants work for a foreign governmental agency, which helps developing countries and improves economic cooperation. They have been working for a long time with the client country. Since the legal framework needs to be compatible with the new blockchain system, the legal consultants advise the client how to do this best.	
Interests and Expectations	**Motivations**
Consulting:	
- To not tell the client how they must implement things, but to show them possible difficulties and risks. - Help client countries to develop themselves.	- Let the client find its own solution, that they will be happy with. - Build business partners and have a good relationship with them.

4.3.3. Dynamics within the Collaboration

Influence of Blockchain on inner dynamics

The governmental worker from interview 01 observed that with public-private partnerships and blockchain governance functions can be outsourced to the technology. By identifying a person through the internet and having safe and secure databases governance can be done online. Additionally, since blockchain usually makes the most sense to use between organizations, it allows sharing of risks.

Collaboration structure

Since the governmental agency acts as a client towards the other partners, they have the power to follow their interests, which gives this collaboration a hierarchical form. The legal advisors and the technological partners have a memorandum of understanding with the governmental agency.

Collaboration between actors with different backgrounds

Interviewee 02 from the legal consultancy observed, that it is challenging to work with actors from different areas of expertise. For example, lawyers will typically not be very fluent in the technological space and vice versa. Interviewee 02 decided to take courses on the topic of blockchain, to improve his understanding of the topic.

Choice of technological partner

Both interviewed legal advisors and the governmental employee emphasized that the partners should be chosen carefully. The legal consultants had strong opinions when it comes to the choice of the technological partner. For one they believe it is important for the governmental agency to have ownership of the solution and not depend on the technological partner. Additionally, the governmental agency should make sure, that the technological partner can provide the fitting solution. One legal advisor says that: "it would be much preferable to put out a call for proposals for a system that would be designed and tailored to meet the legal and regulatory needs from the outset as well as having an eye to certain technical requirements." (C03_I04, Pos. 12) In other words this person is warning about standard solutions which might not fit the requirements.

4.4. C04 – Track and trace of pharmaceuticals

4.4.1. Description of the Consortium

The following table introduces the consortium "C04 – Track and trace of pharmaceuticals". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 22: The description of C04. Own representation.

C04 – Track and trace of pharmaceuticals	
Description	
The technological partner invited manufacturers and wholesalers of pharmaceutical products to build the optimal platform for a better management of the supply chain. The business partners are partly motivated, due to a new law in that area which requires a new solution. The technological partner acts as host and middle ground for the business partners.	
Why Blockchain?	
Ability to connect competitors as a network. Immutability of data. No central entity, which improves trust and high security.	
Members	**Interviewees**
1 Technological partner	01 – Technological partner
3 Business partners – Manufacturers	02 – Business partner – Manufacturer
3 Business partners – Wholesalers	03 – Business partner – Wholesaler
Interests and Expectations	**Motivations**
- Comply with new law. - Digitalization and automation. - Fix billing system / revenue leakage.	- Avoid sanctions. - Efficiency gains, financial incentives. - Avoid losing revenue.

4.4.2. Stakeholders Interests, Expectations, and Motivations

Table 23 introduces the technological partner, table 24 the manufacturers and table 25 the wholesalers.

Table 23: Description of the technological partner from C04. Own representation.

Description: Technological partner	Type: Organization
Roles: Develop the solution, project lead, initiator	
The technological partner is also the initiator of the consortium. They are experienced in blockchain, pharma, and supply chain management. Due to the new law and their skills they saw a business opportunity and onboarded the business partners.	
Interests and Expectations	**Motivations**
Business interests:	
- Set up and run the network. - Create blockchain protocols. - Do the best for the entire industry and not for one company. - Avoid working on business problems which give competitive advantages.	- Running a blockchain solution is a crucial role. - Financial gains. - Being trusted by everyone. - They prefer to get an industry to work better.
Collaboration:	
- Manage the network. - Expects that the partners assign a project manager, provide resources, and provide feedback.	- Build the best possible solution and ensure their own success. - Have a great collaboration structure.
Technological interest:	
- Ensure data privacy.	- Blockchain does not offer data privacy out of the gate, which is a weakness.

Table 24: Description of the manufacturers from C04. Own representation.

Description: Manufacturers	Type: Role
Roles: Pharmaceutical manufacturer	
The manufacturers role consists of three organizations, which have a combined market share of roughly 90%. Their priorities are to stay a leader on the market and to comply with regulations.	
Interests and Expectations	**Motivations**
Business interests:	
- Fix the revenue leakage issue. - Interested in a better tracking of their products. - Comply with local regulations. - To be up to date and aligned with the developments on the market. - Combat counterfeits.	- The current billing system of manufacturers is bad and lots of money is lost due to it. - Comply with local regulations. - Avoid sanctions. - To stay a leader in the market. - Counterfeits damage the market and reputation.

Technological interest:	
- Skeptical regarding the potential of blockchain. Educate themselves. - To be able to guard and control their data.	- Prove that blockchain is not an appropriate solution. - The organizations are not willing or able to share any information.

Table 25: Description of the wholesalers from C04. Own representation.

Description: Wholesalers	**Type: Role**
Roles: Pharmaceutical wholesaler	
The wholesaler's role consists of three organizations, which control most of the sale of drugs. Their priorities are to stay a leader on the market and to comply with regulations.	
Interests and Expectations	**Motivations**
Business interests:	
- Interested in a better tracking of their products. - Comply with local regulations. - To be up to date and aligned with the developments on the market. - Find value beyond compliance.	- Comply with local regulations. - Avoid sanctions. - To stay a leader in the market. - When setting up a solution for compliance, also treat other problems to ensure that the most is achieved the change.
Technological interest:	
- Skeptical regarding the potential of blockchain. Educate themselves. - Avoid a central data authority.	- Prove that blockchain is not an appropriate solution. - To not give anyone the power over all that data.

4.4.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

The participants need to be educated on the blockchain technology.

Committing resources

While the business partners were interested in discussing the use case, they were not interested in committing resources to the cause. Only after a wholesaler agreed to join the project and commit resources competitors felt obliged to be part of the project. This is due to the motivation of the competitors to be market leaders and not wanting competitors to have an advantage.

Middle ground

The interviewed business partners appreciated that the technological partner did the project lead. They enabled collaboration as a neutral party between competitors and the outcome is good. Additionally, since the technological partner is interested in selling the solution, they have the motivation to drive the collaboration to do progress.

Antitrust law

Since competitors decided to collaborate it is crucial that no antitrust laws are breached. The compliance is achieved followingly: "We start every meeting with an antitrust statement and warning, to make it clear. Because again, I mentioned these guys [company representatives] spend more time with each other than they do with their families. These competitors know each other, and they are actually very well-trained, I'd say for lack of a better word, to stop conversations and not even get conversations to go to a place that is antitrust." (C04_I01, Pos. 211)

Legal form

The technological partner suggested early on that the IP of the solution should be owned by all partners and create a legal entity for that. Comparing to the other cases that would be a standard approach. However, the business partners agreed that they were not comfortable sharing IP with competitors and even feared risks due to liability issues in case some part of the solution failed. This means that the technological partner kept all responsibilities for development and collaboration. Later in the collaboration the business partners seem to be less opposed to creating some form of legal entity and this topic is being discussed again.

Collaboration difficulties

From the technological partner and project leader perspective they describe the biggest challenges in collaboration as follows:

- "The challenge to me is just getting companies to come together and agree on rules that they want to follow and then not disagreeing but seeing enough value in it that they want to sign up and operate the protocol or run the solution." (C04_I01, Pos. 88) Or in other words: "You need a win for everybody. For this, for them to be willing to come to the table and do it." (C04_I01, Pos. 215)

- Secondly it is difficult to get people to move along, since this project is not the only priority for their companies. The project leader sees it as their role to make this collaboration important enough for the companies to invest their time and participate.

The importance of these issues is confirmed by the business partner from interview 02 sees the "continued participation and engagement amongst a wide variety of industry stakeholders" as a key success factor (C04_I02, Pos. 131).

A further observation made by the interviewees is that it is remarkable that a collaboration between strongly competitive actors is being achieved. Contributing factors are that the interests of the participants are aligned and that everyone is treated equally. More details in the following section.

Differing interests / compromise / agreeing on a set of rules

The interviewees could not remember any situation where there was strong disagreement between the partners. Still they had to find consensus when designing the solution. Following dynamics helped achieve finding consensus:

- The partners understood that "they may have to give a little to get the whole thing" and a collaborative spirit was present (C04_I01, Pos. 103).
- The partners need to be open minded enough to think through different ways to implement something and put their ways aside.
- When the ideal solution for some partners were not implementable due to other constraints, there was enough dialogue to create an understanding and acceptance for these limitations.
- If agreement could not be found, the technological partner would push for high level protocols on how a process should be modeled, but then create individual business rules at a trading partner level.

The goal when collaborating is that everyone agrees on the rules, so that a solution can be found where everyone can see himself use and get benefits.

4.5. C05 – ERP system for SME e-commerce

4.5.1. Description of the Consortium

The following table introduces the consortium "C05 – ERP system for SME e-commerce". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 26: The description of C05. Own representation.

C05 – ERP system for SME e-commerce	
Description	
This consortium has the intention of building an ERP system for SME e-commerce. Currently logistics cannot offer any automated solutions for SMEs and the goal is to build a standard solution to allow automation. Including financial services should additionally eradicate administrative tasks.	
Why Blockchain?	
Automate using smart contracts. Blockchain enables collaboration between multiple organizations. Especially since blockchain enables a form of data sharing, which was not possible earlier. Enable transparency within the supply-chain.	
Members	**Interviewees**
1 Technological partner 2 Business partners with in-house development	01 – Business partner – Logistics 02 – Business partner – Financial services 03 – Technological partner
Interests and Expectations	**Motivations**
- Non-profit solution. - ERP for SME e-commerce. - Extendibility. - Gain blockchain experience.	- One of the members is non-profit. - Business potential. - Include more services on the platform. - Solve inefficiencies with blockchain.

4.5.2. Stakeholders Interests, Expectations, and Motivations

Table 27 introduces the logistic firm, table 28 the financial services firm and table 29 the technological partner.

Description: Logistic firm	Type: Organization
Roles: E-commerce and logistics expert, co-development	
SMEs are a difficult clientele for the logistics firm, because they create a lot of work for little earnings. By offering a standardized solution they hope to better access this market segment. The firm develops the logistics interface of the solution.	
Interests and Expectations	**Motivations**
Business interests:	
- To be aware of new topics and business models in their sector. - To have quick results and ROI. - To improve their offerings for SMEs. Have automated delivery services.	- Financial gains and to be a market leader. - Financially motivated firm needs confirmation whether their money is spent in the right place. - Financial gains by accessing a new market segment.
Technological interest:	
- Strong interest of understand the impact of blockchain for their business.	- Educate themselves, financial gains, and to be a market leader.

Table 28: Description of the financial services firm from C05. Own representation.

Description: Financial services	Type: Organization
Roles: Financial services and tax expert, co-development, consortium lead	
This organization is non-profit and offers financial services. An e-commerce SME would be a typical client for this organization. In development they contribute to the commercial processes, the user interfaces, and a smart contract builder.	
Interests and Expectations	**Motivations**
Business interests:	
- Expects the consortium to be non-profit. - Secure data. - Improve collaboration for their clients with auditors. - Improve collaboration for their clients with tax authorities and advisors. - Less interested in having quick ROI.	- Their legal form is non-profit. - Financial data is sensitive data. Security is part of their identity. - Make audits cheaper. - To be less prone to errors in taxations. - As a non-profit they have less pressure to ensure financial gains.
Technological interest:	
- Interested in being up to date with blockchain.	- Blockchain has the potential to be disruptive, the goal is to not be disrupted.

Description: Technological partner	Type: Organization
Roles: Lead development	
This technological partner has a good reputation for their trustworthiness and IT security. They have been a partner of the logistic firm for quite a while. The technological partner is responsible for the development of the blockchain part of the solution.	
Interests and Expectations	**Motivations**
Business interests:	
- To have quick results and ROI. - Interested in high security standards.	- Financially motivated firm needs confirmation whether their money is spent in the right place. - High security is a selling point.

4.5.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

The members recognize some challenges with the hype of blockchain as the root cause. Since blockchain has been used as a marketing tool and crypto currencies have mixed reputations, many people are cautious with trusting blockchain projects. And others have a wrong understanding of the capabilities of blockchain. Now this consortium needs to put in extra effort to prove themselves as trustworthy and educate the public on what blockchain is about.

As a second observation, the interviewees say that blockchain enables collaborations with organizations "who are not from our home turf" (C05_I01, Pos. 186). This collaboration was not dared before. Blockchain enables new relationships between actors of different interests, mindsets, and ideas. Simultaneously this means that different cultures meet, and cultural transformation happens. Blockchain requires one to be more visionary and to think bigger, but also remember that these ideas must stay implementable. The interviewees also observed that the employees, who work with blockchain and innovation, but work for different consortium members did have similar mindsets and got along well. However, interviewee 02 thinks that blockchain does not change how people in a consortium interact. They view this collaboration as a project and that projects are influenced by the people involved.

Monetization

The members are interested in monetizing the solution, but do not know yet how to do so. The cause seems to be, that they do not know any comparable business models and need to find it themselves.

Setting up a vision

At the start of the collaboration the members organized a workshop. In this workshop they agreed on a vision, how they intend to work together, including communication and data sharing tools and plenty more to set up the collaboration. Interviewee 01 describes the agreement on a common vision, where every participant sees value as one of the biggest successes of the consortium. They believe that if anyone does not understand the vision then the vision has either been poorly explained or further information needs to be given.

Collaboration structure

Areas of tasks have been split between the members. Notably there is not one project lead, but every member takes lead over their interest area and pushes progress on that front. The interviewee 02 sees the big advantage, that having every participant as a leader is helpful for motivating and supporting each other. Sometimes some participants can become frustrated, but there is always a leader who is motivated in keeping the collaboration going.

The development is managed in a similar fashion. Every partner develops their own solutions they want to provide for the platform, but the core system is done together. This sharing of responsibilities and tasks is enabled by creating a common vision, in which all interests of the participants are included and by having partners who complement each other well.

Decision taking

When decisions are to be taken in the consortium, the employees of the members on the project can take decisions and do not have to go up their hierarchical structure. This ensures the required agility to progress in the project. The partners discuss decisions with each other and usually come to a consensus.

Different interests

The technological and logistics partner are both interested in having income from this project rather quickly. Whereas the financial services provider is ready to spend more time on researching the optimal way of building the solution. While those interests defer, this dynamic is still viewed positively, since the interests balance each other out. Two members are pushing the solution to be built and one is making sure that everything is done well.

4.6. C06 – Peer-to-peer energy trading

4.6.1. Description of the Consortium

The following table introduces the consortium "C06 – Peer-to-peer energy trading". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 30: The description of C06. Own representation.

C06 – Peer-to-peer energy trading	
Description	
Due to the increase in production of renewable energies on a household level, the energy eco-system expects that in the future energy will be traded between households and the powerplants' new role will be to balance the energy network. This consortium has the goal of researching and setting up peer-to-peer energy trading between small energy producers.	
Why Blockchain?	
Peer-to-peer setup and blockchain pair well. Trade systems and blockchain pair well. Blockchain creates trust and transparency. Privacy and data protection is with blockchain compatible. Check out the blockchain hype.	
Members	**Interviewees**
2 Academic partners 2 Business partners 1 Technological partner	01 – Academic partner 02 – Business partner – Energy infrastructure, leading engineer of the consortium 03 – Business partner – Powerplant
Interests and Expectations	**Motivations**
- Build the future energy market. - Decentralization and trust. - Influence design of local laws.	- Adjust to changing needs, financial gains. - Enable peer-to-peer trade. - Current law limits blockchain solutions.

4.6.2. Stakeholders Interests, Expectations, and Motivations

Table 31 introduces the first academic partner, table 32 the second, table 33 the technological partner and table 34 the energy and network provider.

Table 31: Description of the academic partner 1 from C06. Own representation.

Description: Academic Partner 1	Type: Organization
Roles: Blockchain expert	
This academic partner joined the consortium later than the other partners. The reason being that the other partners already worked on two projects together and only with this third project required a blockchain expert. Their role is to guide the project regarding the possibilities and limitations of blockchain and setting up business models for the peer-to-peer trading. They are a private research institution and have financial incentives.	
Interests and Expectations	**Motivations**
Operational interests:	
- To be on a blockchain project where the technology is implemented. - To patent their findings.	- To not only work with theoretical cases and to make long term observations. - Financial gains.
Academic interests:	
- Blockchain and digitization in the energy market	- Those are their research areas.

Table 32: Description of the academic partner 2 from C06. Own representation.

Description: Academic Partner 2	Type: Organization
Roles: Energy network research	
The second academic partner does research in energy networks and how trade can work in these networks. They have a big research facility where the new energy system can be designed and tested.	
Interests and Expectations	**Motivations**
Academic interests:	
- Interested in the behavior of energy networks and trade on these networks.	- Those are their research areas. - To publish papers.

Description: Technological partner	Type: Organization
Roles: Software implementation	
The technological partner is responsible for building the software, which will enable the peer-to-peer energy trading. Currently they are building a prototype of the solution. Their intention is to sell the software to the organization which will run these trading systems.	
Interests and Expectations	**Motivations**
Business interests:	
- Building solutions which support the energy transition. - Sell the software to whoever wants to run such an energy system. - No interest in running the system later. - To patent their creations.	- Financial gains through creating and selling innovative solutions. - To protect their creations.

Description: Energy and network provider	Type: Organization
Roles: Energy network expert, project management	
There are two organizations, the energy provider and the infrastructure or network maintainer. The infrastructure organization is a subsidiary of the energy provider and their interests are the same, which is why the two organizations are discussed as one in this analysis. In the new system the energy provider loses his business and to rebrand the organization they are part of the consortium. They provide a testing environment for the consortium.	
Interests and Expectations	**Motivations**
Business interests:	
- Infrastructure planning. - Better planning of energy consumption. - To find new business models. - Interested in running the energy trade platform.	- The infrastructure is very expensive and can be used for a very long time. Investments in the infrastructure must be done carefully. - Currently the networks can be overloaded, which creates inefficiencies in the system. - The energy provider will lose their business in the new system and must take a new role to survive. - Financial gains and replace the business model.

4.6.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Interviewee 02, who is the leading engineere of this consortium, is bothered by the fact that people take blockchain and try to find a use case for it instead of looking at problems and then decide that blockchain might be a possible solution for it. Also, they say that blockchain as a technology is not fully ripe yet and many discussions in that area are based on opinions and not on facts.

Solution design

This consortium decided to create work packages and assign teams to them. These teams are responsible for the package and viewed as experts. When the work package group must take a decision, consortium members outside of the work package group may share their opinions, but the teams from the work package have more say, since they are the experts on that subject. Nonetheless the goal is to find consensus between the members.

Since this project is building a complex system, the engineering lead acts as system integrator and stakeholder manager. Meaning that their role is to make sure, that the different parts which are being built fit and work together. Additionally, there are stakeholders who already own certain hardware or have other interests towards the solution, which must be met. These stakeholders must be identified and included into the solution for a cooperation to work. This step is time intensive and nerve-wracking, but necessary.

Collaboration

This consortium was formed after two other projects already had been completed with the same partners. Meaning that they knew each other well and had experience working together. Having such a head start helped the consortium to get going immensely and to find consensus for the new project. Still an unresolved conflict is mentioned between a private research institute (academic partner) and the energy infrastructure firm. Both parties are interested in patenting the solutions they come up with and are therefore competitors. The energy infrastructure firm says that a collaboration between the two is difficult and that they generally prefer to work with public universities.

Regulation

The consortium creates new concepts, which do not always comply with the current law. Because they believe that the current laws do not always make sense, they allow themselves to sometimes ignore regulations to

build the optimal solution. Since the regulators are interested in not being in the way of progress, the consortium does communicate with them to give their input for designing future law.

4.7. C08 – Service platform for shipping

4.7.1. Description of the Consortium

The following table introduces the consortium "C08 – Service platform for shipping". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 35: The description of C08. Own representation.

C08 – Service platform for shipping	
Description	
This consortium consists of a port, a bank and a company which has their goods shipped all over the world. Together they are building a platform in the shipping eco-system which ties physical, financial, and information flow. The port wants to automate processes and improve their services. The bank wants to sell financial products and the producer of goods better understand the status of his goods. Further goals of the platform are to be interoperable with other systems and the expandability of the platform with further services.	
Why Blockchain?	
Decentralized data, yet still allow data exchange, which is done through distributed ledgers. Single source of truth, trusted data, validation technology.	
Members	**Interviewees**
3 Business partners with in-house development	01 – Business partner – Port – Technical Team 02 – Business partner – Port 03 – Business partner – Producer of goods
Interests and Expectations	**Motivations**
- Improve global trade by integrating physical, financial and information flows. - Decentralized data. - Interoperability between platforms.	- Efficiency and financial gain. - Interest expressed by market. - Increase network and services offered.

4.7.2. Stakeholders Interests, Expectations, and Motivations

Table 36 introduces the technological partner, table 37 the port, table 38 the bank and table 39 the producer of goods.

Table 36: Description of the technological partner from C08. Own representation.

Description: Technological partner	Type: Organization
Roles: Development, initiator	
The port is the parent organization of the technological partner. The technological partner positions itself as an implementation partner for blockchain solutions.	
Interests and Expectations	**Motivations**
- To work with Ethereum.	- They are experienced with Ethereum and it has the best base of developers.

Table 37: Description of the port from C08. Own representation.

Description: Port	Type: Organization
Roles: Expert for port business, Sales lead	
The wholesaler's role consists of three organizations, which control most of the sale of drugs. Their priorities are to stay a leader on the market and to comply with regulations.	
Interests and Expectations	**Motivations**
Business interests:	
- Change their role in the shipping process. - Adapt the organizational culture. - The port leases its infrastructure to commercial parties. - Collaborate on supply chain management.	- Digitalization offers new possibilities. - These changes come with digitalization. - Financial gains / business model. - Supply chain is too complicated to manage alone.
Technological interest:	
- Interested in digitalization. - Interested in blockchain. Set up a blockchain lab (the technological provider).	- Provide digital infrastructure to facilitate trade and supply chains. Financial gains. - To experiment with future business models.

Table 38: Description of the bank from C08. Own representation.

Description: Bank	Type: Organization
Roles: Financial lead	
The bank is a partner of the producer of goods. Their role is to offer financial services on the platform.	
Interests and Expectations	**Motivations**
Business interests:	
- Provide their financial services related to global trade on the platform.	- Financial gains.

Table 39: Description of the producer of goods from C08. Own representation.

Description: Producer of goods	Type: Organization
Roles: Expert in having their goods shipped, co-development	
This organization represents the consumer of the platform.	
Interests and Expectations	**Motivations**
Business interests:	
- Interested in a better track and trace system for their shipments. - Collaborate on supply chain management.	- To know the status of their goods. - Supply chain is too complicated to manage alone.
Technological interest:	
- Interested in working with Hyperledger.	- Already got experience with it.

4.7.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

When asked, whether "blockchain, an exciting technology enhances the cooperation to a certain degree?" the answer was positive, especially since blockchain is something new for everybody and the participants discover things together, which bonds people (C08_I02, Pos. 194). Blockchain does not only bond people between organizations, but also within the organizations blockchain communities have been formed.

The members also observed that blockchain highlighted pain points or gaps in processes, to which they were blind before. "[Blockchain] enables to revise the business how we do it now. If you don't know that you have a problem, you don't have a problem. Until something happens that shows you that you have a problem, and

then you want to find the solution" (C08_I03, Pos. 134). The interviewees recognize now that there is always something to optimize. At the same time people are still trying to fit traditional business models and business cases on blockchain solutions, which does not work.

Collaboration Setup

When setting up the consortium, the partners signed a MoU. It was signed by either a board member or c-level management and had following contents:

- The scope of the project, including time frame and deliverables.
- Definition of IP. How IP is shared.
- Agreement on giving each other licenses for developments done by a partner.
- The governance structure, including the steering committee. Every partner has one c-level manager in the steering committee.

To ensure that every partner commits resources in a similar fashion, the consortium also set up a bank account, where each member would contribute the same amount of money, which was reserved for expenses the consortium would encounter. Examples are travel and consultancy. Every partner also tracked the hours spent on the project to be held accountable. If one party has a deficit, they would compensate the missing hours financially towards their partners.

Collaboration success factors

The interviewees identified several dynamics, which contributed to a successful collaboration.

- Setting up and applying the rule, that all partners contribute equally. The members feel equal.
- Having every person on the project following the same goal, with the same mindset and determination to succeed.
- Overcoming cultural differences between organizations. This process increases trust and willingness to collaborate. This was partly achieved by visiting each other and spending time together. Since some partners are in Europe and others in Asia this step was not obvious but helped bonding immensely.
- Matching responsibilities of tasks with the people who are most fitting for it.
- Creating a common dictionary. This process is reported to be challenging.
- One interviewee believes that the consortium should be run like a company. Everybody should be working at the same place, to be focused on that project and be in contact with each other. If an employee works at his usual office, co-employees will distract from the consortium project.

Decision taking

Usually discussions are led by the most experienced person on the topic. Important decisions are brought to the steering committee and decided top-down. The members of the steering committee must be of high enough position to decide for the organization they represent, without going back to discuss the decision.

Competitors

The members agree, that including competitors on the platform is desirable, due to network effects. But direct competitors should not be the first partner on the network, which means that one has to find the correct timing for onboarding competitors.

Regulations

The consortium recognizes that the current laws are not compatible with their intended solution. For example, many governments do not recognize digital documents as legally binding. Consequentially the consortium decided "to prove the technology and the concept first before we start into these legal and regulatory discussion, because that will kill your concept head on" (C08_I02, Pos. 220). Approaching law makers is viewed as a possible solution as well.

4.8. C09 – Data market for patient health data

4.8.1. Description of the Consortium

The following table introduces the consortium "C09 – Data market for patient health data". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 40: The description of C09. Own representation.

C09 – Data market for patient health data	
Description	
This consortium acts internationally and is based in the EU. They are also funded by the EU. Due to administration work it is currently very difficult for researchers to use patient health data from hospitals. This blockchain solution should make compliance with regulations for sharing data easy and by creating a data market incentivize and reward the sharing of patient health data.	
Why Blockchain?	
No central entity, which improves trust and high security. Additionally, it brings organizations together. Track and control logs if anything in the blockchain changes. Standardized and automated contracts.	
Members	**Interviewees**
2 Consultants	01 – E-health consultant, project lead
2 Tech partners	02 – Technological partner
4 Academia – Technological support	03 – Law consultant
2 Academia – Medical support	04 – Business partner – Medical engineers
1 Business partner	
3 Hospitals	
Interests and Expectations	**Motivations**
- Improve data flow from hospitals to research centers. - Improve access and control of data for patients. - Security of the platform	- Enable medical research. Efficient sharing of health data and automate processes. - Respect patients' interests. Comply with GDPR. - Perfect compliance with law and expectations.

4.8.2. Stakeholders Interests, Expectations, and Motivations

Table 41 introduces the e-health consultant, table 42 the legal consultant, table 43 a technological partner, table 44 health engineer and table 45 the hospitals.

Table 41: Description of the e-health consultant from C09. Own representation.

Description: E-health consultant	Type: Organization
Roles: Initiator, project lead, product manager	
This organization specializes in e-health solutions, which is about how you can process and distribute health data. They initiated the project, do all the coordination and act as product manager. It would be their role to later sell the technology. It is unclear whether they are motivated by future financial gains or not.	
Interests and Expectations	**Motivations**
Technological interest:	
- Interested in blockchain. - Interested in enabling data sharing and processing in the health industry.	- Due to its potential for collaboration. - Currently due to regulations and non-standardized systems difficult.

Table 42: Description of the legal consultant from C09. Own representation.

Description: Legal consultant	Type: Organization
Roles: Ensure regulatory compliance.	
The legal consultants are specialized in data protection and privacy, cyber security, and big data. Their role is to help design a solution which is compliant with the General Data Protection Regulation (GDPR).	
Interests and Expectations	**Motivations**
Business interests:	
- To challenge the GDPR. - Interested in legal compliance of blockchain.	- To better understand the limitations and the compliance with the regulations. - Blockchain has a disruptive nature. How does it comply with regulations? - Challenging nature of the project.

Table 43: Description of the technological partner 1 from C09. Own representation.

Description: Technological partner 1	Type: Organization
Roles: Blockchain development	
The technological partner 1 joined the consortium to gain experience in developing blockchain. They are responsible for creating the back-end system of the blockchain.	
Interests and Expectations	**Motivations**
Business interests:	
- To resell the underlying technology to other use cases.	- Financial gains.
Technological interest:	
- To gain experience in blockchain.	- Create business opportunities.

Table 44: Description of the health engineers from C09. Own representation.

Description: Health engineers	Type: Organization
Roles: Consumer of health data	
The health engineers use health data to train AI models and understand how to optimally treat patients. With such a platform they would have a better access to data and be able to train better models. Regulatory compliance is important to them.	
Interests and Expectations	**Motivations**
Business interests:	
- Have access to health data. - Sell results of AI models. - To influence the design of the platform. - To be involved in health data sharing platforms from the start. - Use data consensually and safely.	- To train AI models. - Financial gains. - To make it as useful as possible for them. - To have a head start compared to other health engineering organizations. - Regulatory compliance.

Description: Hospitals	Type: Role
Roles: Uploader of data	
The hospitals would upload the patient data to the blockchain. They are not interested in doing more work to enable the sharing of data, since their priority is to take care of their patients and their overhead is big as it is.	
Interests and Expectations	**Motivations**
Operational interests:	
- To have control over their data, even when it is shared. - Not interested in having more overhead.	- Strict regulations and must be compliant. - Physicians are fed up with the overhead they have.

There are several academic institutions involved in the consortium. They support the project by helping with encryption, multi-party computation, security testing, and creating a user interface for patients to manage their data.

4.8.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

This consortium reports that finding the business model for their blockchain solution caused difficulties. The cause seems to be that blockchain was attractive to use, but difficult to implement. One of the interviewees reports that working on a blockchain project does not change much comparing to working on other projects.

Setting up a vision

Since this consortium consists of many members with different backgrounds and visions of what the platform should enable, they recognized that a consensus building mechanism was necessary to design a solution everybody agrees with. This was done with face-to-face meetings where all details regarding collaboration and solution design were defined. Each partner contributed to the grand vision of the architecture. The result is positive, every partner has a clear understanding of the business orientation and would explain the vision the same way.

A difficulty during this process is, that there are no reference cases. All challenges and decisions are new so often it is not clear what is right or wrong. All visions by the different partners are based on interests and have no proof of being optimal. Interviewee 02 thinks that they spent more time in meetings than was reasonable.

Hospitals and compliance

The purpose of this consortium, to enable sharing of data produced in hospitals, seems to also be the biggest interest conflict in the consortium. Not only is it very difficult for hospitals to share data from a regulatory standpoint, but also the doctors working at hospitals are strongly opposed to increasing their overhead.

While the consortium as whole is strongly interested in following regulations, doctors are inclined to use loopholes in the law to avoid overhead caused by regulatory compliance. For the consortium this is problematic, because if the consortium wants to brand itself as regulatory compliant, but the hospitals and their data are not, then the hospitals have no interest in being part of the system.

Regulations

This consortium decided to fully respect regulations and build the solution accordingly. This achievement is regarded as an important outcome of the project. One regulatory limitation is that data can not be sold, which is crucial for a market. The workaround is that data is traded for services and not for money. To ensure the right to be forgotten, which usually means that data is deleted, the consortium uses a permissioned blockchain. Doing so data can be declared as not available and whoever has it stored locally informed to delete it.

When the blockchain observatory from the European Commission published best practices for complying blockchain with the regulations, the consortium already had figured that information out three years earlier. The authorities are interested in receiving feedback by practitioners but expect that these parties follow privacy-by-design and that the feedback is realistic for the regulatory framework.

Product management

Interviewee 01 acts as a product manager meaning that they must understand and communicate the solution very well. That way the product manager can discuss the requirements with the different developers and keep the overview of the development for the platform as a whole. The product managers role is also to make sure that everyone's expectations are met. This is done by showing developments to the stakeholders and getting feedback or confirmation.

4.9. C10 – Improve trade financing

4.9.1. Description of the Consortium

The following table introduces the consortium "C10 – Improve trade financing". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 46: The description of C10. Own representation.

C10 – Improve trade financing	
Description	
This collaboration of banks decided to rework the trade financing. The old process created so much overhead, that banks only offered trade financing products for large trade deals. To provide trade financing for small to medium sized deals, the process needs to become more automated and stay safe. This is done by creating a trading platform which is based on blockchain and smart contracts. The participating banks are geographically segregated, and the consortium later merged with C20.	
Why Blockchain?	
Distributed ledger improves acceptance when there are heterogenous participants. No single actor should hold all the power by managing all the data. Only the involved actors should see the data (permissioned blockchain). Data security important, since a lot of money is involved. Make digital contracts with smart contracts.	
Members	**Interviewees**
1 Technological partner 5 Business partners – Banks	01 – Business partner – Bank 1 02 – Business partner – Bank 2 03 – Business partner – Bank 3
Interests and Expectations	**Motivations**
- Enlarge the trade financing market. - Automate trade financing. - Offer further trade services.	- Financial gains. - Enlarge the trade financing market. - Increase the network and attractivity.

4.9.2. Stakeholders Interests, Expectations, and Motivations

Table 47 introduces the banks, table 48 one of the banks with a different view and table 49 the technological partner.

Table 47: Description of the banks from C10. Own representation.

Description: Banks	Type: Role
Roles: Banking experts, User of platform	
The banks are interested in improving the trade financing process, to offer financial products in that business segment to smaller clients. They are active in different geographical markets, which reduces competition within the consortium.	
Interests and Expectations	**Motivations**
Business interests:	
- Access a new market segment with big potential. - Automation of manual processes.	- Financial gains. - Cost reduction.
Technological interest:	
- To gain blockchain experience. - To do a blockchain project with utility.	- Check out the hype. - Get return on their investment.

Table 48: Description of a bank from C10. Own representation.

Description: Bank	Type: Organization
Roles: Business partner	
The bank interviewee 02 works for. Their motivation to be part of the consortium defers from other banks.	
Interests and Expectations	**Motivations**
Business interests:	
- To participate in this consortium.	- Fear of disruption in the market due to the new platform.
Technological interest:	
- Interested in blockchain, but not a selling point to participate in this consortium.	- Not the first blockchain project, the business aspect was more important.

Description: Technological partner	Type: Organization
Roles: Development	
The technological partner has strong relations to most of the partnering banks. They develop the blockchain solution using their blockchain framework. The technological partner co-invests into this platform.	
Interests and Expectations	**Motivations**
Business interests:	
- To sell their framework. - To tie their clients closely.	- Financial gains. - Make their clients depend on them.

4.9.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Blockchain enables acceptance for systems with heterogenous actors. It also helps the project by giving an innovative taste to it, which creates attractiveness. Participating organizations are more willing to provide funds for the project and involved employees are eager to contribute.

Then again one of the interviewees does not think that the technology influences the collaboration.

Interviewees observed that blockchain requires education and that it is challenging to think within the new possibilities of blockchain and ignore the limitations of the previous technologies, but still make the two worlds compatible.

Decision taking

When there is a decision to take the partners would first discuss the topic in detail, set a time limit by when the opinion must be formed and then vote on it. The topic for discussion was given to one or two partners for preparation, which allows the handling of issues in a quick matter. Usually the partners found consensus during the discussions and the votes were close to unanimous. All banks and the technological partner have the same power when it comes to votes. But if a topic for vote creates conflict of interests, then the technological partner would be excluded. It is emphasized that the people representing the organizations must be able to take decisions. Organizations who want to participate in consortia should let their employees roam freely and have the employees do status reports every now and again.

Collaboration as competitors

The choice of partners was done by selecting banks who are active on different geographical markets. This ensured that no rivalries existed, and the banks were comfortable to cooperate. All banks joined to solve a common pain point and worked well together. They understood that they are not able to fix these issues alone and needed to collaborate. This collaboration enabled relationships to form and two banks have initiated other collaborations from this relationship.

To ensure that antitrust laws are respected lawyers have instructed the partners on the rules which need to be set up and respected. Antitrust limits information sharing regarding pricing and business processing. The development of platforms and applications on which the banks will do their business is fine.

Dynamic between technological partner and business partners

The banks view the collaboration with the technological partner critically on several fronts.

- For the banks it is uncomfortable that the technological partner can earn money from this collaboration before all others do. The technological partners carry fewer risks.
- The banks are also strongly interested in avoiding dependencies from the technological partner. In case the consortium decides that the solution should be run by other partners, it should be possible.
- Setting up the contracts with the technological partner was a lengthy process, because of disagreements on intellectual property. The interests on IP of the technological partner and the banks are opposing.

Including other business sectors

Interviewee 02 thinks that it would have been difficult to include partners from other business areas, even though for example including a logistician would enhance the platform greatly. The interviewee believes that since the consortium is initiated by banks and all business partners are banks, any other stakeholder would not feel comfortable in the environment.

Merger with C20

This consortium decided to merge with the consortium C20, which will be looked at later in this paper. Both C20 and C10 had almost identical goals. Since C20 already had a legal entity, C10 decided to join them and not other way round. In this process the two consortia merged the existing solutions by taking the best of both worlds. The merger was rough at first, because the C10 organizations established a culture they enjoyed and did not find a similar spirit in the new group.

Two banks of C10 did not join the C20 consortium, interviewee 03 is employed by one of these banks. They view the merger very critically for several reasons. For one they are disappointed that the energy and culture from C10 was given up. Negotiations with C20 sucked energy from doing progress and brought C10 to a halt. Interviewee 03 thinks that the energy would have been better spent advancing the solution than negotiating for long periods of time. This interviewee also reports that C20 has plenty of issues. In the interviews for case 20 the merger is only mentioned in a positive matter and the issues mentioned by interviewee 03 are not touched upon. It is not clear whether interviewee 03 from C10 is being bitter and spreading misinformation or whether the interviewees from C20 are not touching on negative information.

Employee stress

Employees often work not only on the project of the consortium, but also on the job at their employer. This creates a double burden which can be stressful for the employee.

4.10. C11 – Health insurance approval

4.10.1.   Description of the Consortium

The following table introduces the consortium "C11 – Health insurance approval". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 50: The description of C11. Own representation.

C11 – Health insurance approval	
Description	
Currently certain treatments need to be evaluated manually by the health insurer before the doctor can treat their patient. With the blockchain solution, smart contracts should immediately determine whether the treatment is approved or not. That way patients can be treated the same day as the request is done, instead of coming back to the hospital two days later. The collaboration in this consortium is unusual. Instead of all members working collaboratively, one partner acts as central figure and has the contracts with all other partners. Due to insufficient management the project lacks transparency.	
Why Blockchain?	
Data security through distributed ledgers, trust, accuracy through smart contracts.	
Members	**Interviewees**
1 Technological partner 3 Business partners 2 Hospitals 1 Business consultant + project steering	01 – Business partner – Pharmaceutical company 02 – Business partner – Health insurer 1 03 – Business partner – Health insurer 2
Interests and Expectations	**Motivations**
- Improve treatment approval process. - Test acceptance and practicability of such a platform.	- Faster treatment of patients. - Understand impact of blockchain and potential of the solution.

4.10.2.   Stakeholders Interests, Expectations, and Motivations

The information from the interviews is insufficient to fill tables for the technological partner and the consultant. It is known that the technological partner is a vendor and should not involve themselves in the politics of the project. The consultants represent the pharmaceutical company and should do the project

management. Table 51 introduces the pharmaceutical company, table 52 the first health insurer, table 53 the second and table 54 the physicians.

Table 51: Description of the pharmaceutical company from C11. Own representation.

Description: Pharmaceutical company	Type: Organization
Roles: Funding, initiator	
The pharmaceutical company initiated, funds, and owns the IP from this collaboration. They outsourced the steering of the project to a consultant, but still take the decisions.	
Interests and Expectations	**Motivations**
Business interests:	
- Get their medicine to the patient. - To own and capitalize the solution. Only include the partners for their expertise, not to create an open solution.	- Financial gains.

Table 52: Description of the health insurer 1 from C11. Own representation.

Description: Health insurer 1	Type: Organization
Roles: Health insurance expert, User of the platform	
The health insurer partner is one of the parties which will be using the platform. Their intended role was to provide insights on how their system works, so that the solution could be built. But they were interested in being more active in the solution design process. Their main interest is to automate processes and reduce costs.	
Interests and Expectations	**Motivations**
Business interests:	
- To involve themselves in the design of the solution. - To automate their internal reviews.	- They have consortium experience and have their own requirements to the solution they want to ensure that they are implemented. - Cost and labor reduction.

Description: Health insurer 2	Type: Organization
Roles: Health insurance expert	
The second health insurer is mostly interested in improving the convenience for their stakeholders, being hospitals and customers. As a further goal they mention the internal preparation for new systems including the technological understanding and the culture.	
Interests and Expectations	**Motivations**
Business interests:	
- Increase convenience for hospitals and clients (strong interest). - Interested in managing their data according to their policies. - Not that interested in efficiency gains. - Interested in having all requests from clients to be treated equally. - Get a culture change going.	- Makes them an attractive partner for these stakeholders. - They have strict data policies. - Not part of the corporate goals. - Currently the requests are reviewed manually, meaning that from one person to another the outcome could be different. - Create acceptance within the organization for new solutions.
Technological interest:	
- Strong interest in gaining experience with blockchain.	- To be ready for the future.

Table 54: Description of the physicians from C11. Own representation.

Description: Physicians	Type: Role
Roles: Experts in issuing requests to the health insurances	
The physicians are employed by the hospitals and request the financing of the treatments with the health insurers.	
Interests and Expectations	**Motivations**
Operational interests:	
- To provide their patients with the correct treatment. - Not interested in NDAs.	- To treat their patients. - To share knowledge, they gain on the job. They are partly researchers.

4.10.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

None observed.

Virtual collaboration

For this collaboration meetings were usually held virtually as a call. One of the interviewees says that more face-to-face meetings would have been better for collaboration.

Conflicting interests

The consortium had the rule that partners may not talk about the project with people who are not involved. It is reported that physicians were not happy, since they are scientists and researchers and talking about innovation is what they do. Their motivation for the project was low. The initiating partner says that they are reworking this rule.

Unclear repartition of roles

Both interviewees 02 and 03 report that the repartition of roles in governance is not clear. They did not understand what the organizational tasks were of the business consultant, initiating business partner, and technological partner. The initiating partner seems to not take ownership for several tasks, where the other partners would expect them to do. The interviewees 02 and 03 suspect that the initiating partner lacks project experience.

Consortium setup

Since the initiating partner holds all contracts, the other partners do not have a direct relation to each other. One health insurer says that it is difficult for them to share their requirements with the technological partner, because of this missing relation.

Success factors

Interviewee 03 summarizes the three success factors for a consortium as follows. Firstly, to set up contracts between the participants, then to ensure that the consortium has all participants it needs, and lastly the drive to succeed. They say that they think there should be more participants from every area, especially the number of hospitals which are part of the consortium seems too low to them.

4.11. C12 – Temperature tracking of deliveries

4.11.1. Description of the Consortium

The following table introduces the consortium "C12 – Temperature tracking of deliveries". The table contains a brief description of the consortium, the problem the consortium is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the consortium.

Table 55: The description of C12. Own representation.

C12 – Temperature tracking of deliveries	
Description	
This collaboration is between an enterprise resource planning (ERP) provider, a startup which will sell the temperature tracking service and a logistics organization. The goal of this collaboration is to help the startup engineer the optimal product and then integrate it as a standardized service on the ERP-system.	
Why Blockchain?	
Profit from immutability of the data. Have a trustworthy system. Do process optimization.	
Members	**Interviewees**
1 ERP provider	01 – ERP provider
1 Blockchain startup	02 – Blockchain startup
1 End-user – Logistics	
Interests and Expectations	**Motivations**
- Standardize the service. - Fill the market need.	- Sell the service to several logistics organizations. - Financial gains and regulatory compliance.

4.11.2. Stakeholders Interests, Expectations, and Motivations

Table 56 introduces the blockchain startup, table 57 the ERP provider and table 58 the logistic firm.

Description: Blockchain startup	Type: Organization
Roles: Developer, solution owner	
This organization creates a temperature tracking service for deliveries. They use blockchain to prove that the temperature has always stayed within a certain threshold. As a startup they are developing their service and collaborating with a potential client and with the ERP system, on which the service will be offered.	
Interests and Expectations	**Motivations**
Business interests:	
- Create a service which currently does not exist but is needed. - Partnering with the ERP provider. - Partnering with the logistic firm (client).	- Fill a gap in the market, financial gains, offer a solution for regulatory compliance. - Facilitates the process of integrating the service with deliveries. - Build the optimal service for the client.

Table 57: Description of the ERP provider from C12. Own representation.

Description: ERP Provider	Type: Organization
Roles: Enabler, partner of blockchain startup	
The ERP Provider is interested in having a system, which as many services as possible are integrated to it. To achieve this, they provide support for third-service providers to create a solution which is integrated in the ERP system. This improves their offering for clients and makes them a leader on the market.	
Interests and Expectations	**Motivations**
Business interests:	
- To have plenty and innovative services integrated in their system. - Not interested in the intellectual property of the third-party service. - Third-party solutions should be standardized. - Support the integration of third-party services onto their solution. - Provide a network of organizations for the third-party.	- To be the number one ERP system on the market. - Leave the responsibility to the third-party. Focus on their own business model and skills. - Best compatibility with the ERP system. - To improve the capabilities and potential of their service.
Technological interest:	
- Blockchain is not a motivation for collaboration.	- The blockchain functionality is used for the service, not for the ERP system.

Table 58: Description of the logistic firm from C12. Own representation.

Description: Logistic firm	Type: Organization
Roles: Client, partner of blockchain startup	
This organization is interested in monitoring the temperature of their deliveries. They work with the startup to ensure that the start up builds the optimal service.	
Interests and Expectations	**Motivations**
Business interests:	
- Track and trace of deliveries, including their temperature. - Offer pharmaceutical shipments. - Define the requirements of the solution.	- Understanding the process and delivery status. - Financial gains. - To receive the optimal service.

4.11.3.   Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Interviewee 02 does not think that blockchain influenced collaboration in this consortium, because this project is driven by business interests and not interests in the technology. Interviewee 01 believes that blockchain is a technology which requires consortia for the solution to make sense. This is due to the distributed nature of the technology.

Dynamics between different sized actors

Every partner is strongly interested in getting this collaboration to succeed. As a result, the two large organizations strongly enable the startup to take off. The startup credits the two big organizations for being friendly and helpful.

Collaboration

Trust and good personal relations have been reported as crucial for collaboration. Especially since a startup might fear that one of the larger organizations might steal the idea. Also, that the roles of each partners are clear, and that people believe in the solution. The startup says that culturally it is not easy to collaborate with large organizations, since the startup can be more dynamic.

For the ERP-system it is clear that if the collaboration due to political reasons becomes too complicated, they would discontinue the collaboration. But this decision is taken by more senior positions in their organization.

4.12. C13 – Bank Blockchain community

4.12.1. Description of the Association

The following table introduces the association "C13 – Bank Blockchain community". The table contains a brief description of the association, the problem the association is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the association.

Table 59: The description of C13. Own representation.

C13 – Bank Blockchain community	
Description	
This group describes itself as a loose alliance between banks to explore potential use cases of blockchain. A legal entity formed which does all the organization of the alliance and the development of the solutions. The alliance pools knowledge, best practices, lessons learned and develop blockchain based solutions, which the members are free to use. Further goals are to open the alliance to other financial institutions or even other industries.	
Why Blockchain?	
Understand and explore the potential of blockchain for Fintech use cases.	
Members	**Interviewees**
4 Technological partners 37 Business partners – Banks 1 Legal advisor	01 – Employed by the alliance (Ex-Banker) 02 – Technological partner + Operations of the alliance
Interests and Expectations	**Motivations**
- Explore potentials of blockchain for Fintech solutions. Develop the next generation of Fintech solutions. - Heterogenous members	- Financial gains and efficiency gains for members. - Build standardized solutions, which fit all industries.

4.12.2. Stakeholders Interests, Expectations, and Motivations

Table 60 introduces the banks and table 61 the legal entity formed for the collaboration.

Table 60: Description of the banks from C13. Own representation.

Description: Banks	Type: Role
Roles: Banking expert	
This role consists of 37 banks who are part of the association. Their goal is to share knowledge and profit of blockchain solutions which are available to association members.	
Interests and Expectations	**Motivations**
Business interests:	
- Explore potentials of blockchain. - If you fail, fail fast. - The developed solution should benefit a wide range of people.	- Find potential cost-savings, optimizations, business models, marketplaces. - Avoid wasting resources. - Perception of the public should be positive.
Collaboration interest:	
- Share knowledge.	- With more knowledge, failures are recognized more quickly.

Table 61: Description of the legal entity formed from C13. Own representation.

Description: Legal entity formed	Type: Organization
Roles: Association lead, technological lead	
There is a legal entity which formed to manage the association. Their role is to lead the association and to take over the technological lead.	
Interests and Expectations	**Motivations**
Business interests:	
- Implement and deploy the technology. - Operate the association. - Create an eco-system.	- Interested in the technology. - Financial gains. - Create the best solution.

4.12.3. Dynamics within the Association

Influence of Blockchain on inner dynamics

Both interviewees believe that blockchain improves motivation for collaboration. The hype makes members more active and interested in bringing this topic forward. Compared to other technological projects in banking, blockchain is more exciting. Furthermore, blockchain influences the members to view each other as partners and not as rivals. This goes so far that one of the member banks donated their blockchain solution to the association and lets other banks use it for free.

Interviewee 01 thinks that for their blockchain alliance to succeed it is important to focus on the technology and let the technology drive the transformation. Doing so they believe that challenges can be overcome best and not by studying regulations or having opinion-based discussions.

Since some participants do not fully understand the capabilities blockchain enables, there is education happening within the consortium. This is done as follows: "Well, that is why our message to the non-technical people is always very simple, that blockchain can do immutable data storage and smart asset lifecycle management. That is it. It does not do anything else. So, the business guys, we only try to focus on the business element, not really going into the tech for them, it unnecessarily confuses people." (C13_02, Pos. 206).

Another difficulty associated to blockchain is the interoperability with existing tech. Either the consortium needs to get the systems to work with existing tech or recreate the entire surrounding eco-system. Another difficulty is that the consortium must legitimize to external stakeholders why emerging tech is the correct choice of technology. External stakeholders often do not understand the value added yet.

Data handling

To comply with regulations related to data handling the consortium uses synthetic or mass data. Synthetic data has all sensitive information masked off and all statistical properties can still be used.

Missing partners

Interviewee 01 thinks that including academia in this association would have been very helpful. Also including other industries to create a better eco-system.

Antitrust

When asking about the legal implications of competitors collaborating, it seems as if both interviewees are not very concerned on that front. Key reason being that innovation thrives with collaboration. They also believe that it is in the shareholders interest to be part of innovative initiatives. Interviewee 02, who works for the technological partner, thinks this issue is the responsibility of the bank.

4.13. C14 – Governmental Registries Company

The case C14 has not been analyzed as the other cases have been. This case portrays a company which built and sells a blockchain solution for governmental registries. There is no inter-organizational network to observe, where more than one actor got together to build a blockchain solution. Consequently, there are no internal dynamics to discuss between stakeholders originating from different organizations.

4.14. C15 – Track fish from fisher to consumer

4.14.1. Description of the Consortium

The following table introduces the association "C15 – Track fish from fisher to consumer". The table contains a brief description of the association, the problem the association is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the association.

Table 62: The description of C15. Own representation.

C15 – Track fish from fisher to consumer	
Description	
This collaboration allows a fish brand to track the fish they sell from the fisher all the way to the consumer. The fish brand had the solution developed by a technological partner and onboarded the actors in the supply chain to participate by providing the necessary data.	
Why Blockchain?	
Transparency, immutability, and collaboration throughout the supply chain.	
Members	**Interviewees**
1 Technological partner	01 – Technological partner
1 Business partner – Fish brand	02 – Business partner – Fish brand
Interests and Expectations	**Motivations**
- Provide transparency to the consumer regarding the origin of his fish. - Understand the supply chain. - Offer further trade services.	- Maximum transparency regarding fair trade and control of the supply chain. - Before this solution, the fish brand lacked the overview of the fish journey.

4.14.2. Stakeholders Interests, Expectations, and Motivations

Table 63 introduces the fish brand and table 64 the technological partner.

Description: Fish brand	Type: Organization
Roles: Client of the technological partner	
This organization wants to be as transparent as possible towards their customers, regarding the quality and journey of their fish. Before this project, the organization did not have the full understanding of the journey. An additional benefit of this project are the relations they created within the supply chain.	
Interests and Expectations	**Motivations**
Business interests:	
- Tracing the fish, they sell from fisher to consumer. - Fully understand the fish journey. - Increase sales through transparency.	- Optimize the supply chain, have a better visibility, and better manageability of the supply chain. - To be a Leader regarding transparency of the product journey towards the customer. - Financial gains.
Technological interest:	
- Interested in blockchain.	- Believe that it is the optimal technology for data collection along the supply chain for immutability and trust reasons. - Blockchain works well with the wish for transparency.

Table 64: Description of the technological partner from C15. Own representation.

Description: Technological partner	Type: Organization
Roles: Development	
This technology partner is renown for services outside of blockchain. They are interested in moving into the blockchain services area and therefor are excited to work on this project.	
Interests and Expectations	**Motivations**
Business interests:	
- Purely interested in building the service. No interest in involving itself in the solution. - To develop a standard solution based on this system. - Publicity and reference projects.	- It is the clients' product, not theirs. - Resell the same functionalities to different organizations. - To sell more comparable solutions.
Technological interest:	
- Gain experience with building blockchain solutions.	- Have blockchain development in their portfolio.

4.14.3.　　　　Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Interviewee 02 recognizes that blockchain opens new collaboration possibilities which were previously not thinkable. Advantages of blockchain can be replicated by combining other technologies, but by using blockchain the technological stack stays somewhat simple and more energy can be spent on the actual problem which is being solved. Blockchain allows relations to be more efficient, taking decisions faster and work on problems which were not solvable previously.

When discussing how it is ensured that the data which is put in the blockchain is accurate, interviewee 01 says that the immutability of data creates sufficient pressure for the partners to avoid making mistakes. Because wrongfully entered data can be tracked down to the organization which provided the data and if a partner is unreliable, they make themselves not trustworthy.

An expected difficulty originating in the blockchain technology is the interoperability between networks. What would be the best way to share data between blockchain solutions? The interviewees do not know yet how this challenge will impact them or could be solved.

Interviewee 02 believes that having a clear vision and roadmap are crucial for success. To do a blockchain project to have done a blockchain project does not work.

Collaboration

The technological partner views themself as a neutral supplier and did not have any interests in influencing the setup of the collaboration. They act as a neutral middleman. To enable development and fully understand the project the developers based in Europe flew to North America to meet the fish brand. There they discussed the process which should be depicted in the blockchain.

Onboarding partners

As the initiator, the fish brand, was in charge of onboarding the partners and setting up relations. Connections needed to be made with actors in the supply chain and the technological partner. For the supply chain, relations were set up with local ministries, agencies for international development, NGOs, and more. These agencies are interested in enabling industry growth through technology. The strategic partnership with these organizations helped managing relationships with the fisheries and maintain relationships and consistency across the project. This helps overcoming the difficulty of all actors across the supply chain being distributed around the world in remote places.

The technological partner was chosen because they shared the commitment and passion to drive the project. Additionally, the technological partner is renown, which was sought for since the other players in the eco-system expected a credible partner.

4.15. C16 – Trade platform for previously non-bankable products

4.15.1. Description of the Consortium

The following table introduces the association "C16 – Trade platform for previously non-bankable products". The table contains a brief description of the association, the problem the association is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the association.

Table 65: The description of C16. Own representation.

C16 – Trade platform for previously non-bankable products	
Description	
This collaboration wants to make non-bankable products bankable by tokenizing and selling them on a platform in form of blockchain tokens. An example of non-bankable products are shares of SMEs. Even though the participants build together a market infrastructure, every one of them is following their own interests very strongly. By letting every participant design their envisioned business model for the market and merging them together, the egocentric collaboration seems to succeed.	
Why Blockchain?	
The digital assets require a decentralized network. Immutability of the data for security. Trade items through tokenization. And corporate actions being represented in smart contracts.	
Members	**Interviewees**
1 Technological partner 4 Business partners with in-house development	01 – Business partner – Market access provider 02 – Technological partner 03 – Business partner – Bank
Interests and Expectations	**Motivations**
- Create a market infrastructure for financial institutions to trade currently non-bankable products. - Regulatory compliance. - Make the platform internationally viable. - Allowing every partner to live out their individual interests.	- Market gap with big financial potential. - Required for doing business with regulated financial institutions. - Bigger financial potential. - The partners can shape their own success.

4.15.2. Stakeholders Interests, Expectations, and Motivations

Table 66 introduces the market access provider, table 67 the technological partner and table 68 the bank.

Table 66: Description of the market access provider from C16. Own representation.

Description: Market access provider	Type: Organization
Roles: Co-development, market expert, ensure liquidity in the market	
The market access provider is interested in co-creating a blockchain related marketplace. In this collaboration they act as the expert for markets and should ensure liquidity in the eco-system which is being built.	
Interests and Expectations	**Motivations**
Business interests:	
- Interest in derivative products for cryptocurrencies. - Interested in shaping the future marketplace.	- Financial gains and to follow the market trend. - To be a leader for providing access to the markets of the future and build an eco-system.

Table 67: Description of the technological partner from C16. Own representation.

Description: Technological partner	Type: Organization
Roles: Lead developer	
This technological partner has established itself in the financial industry. They have the expertise of creating interfaces to the IT systems of banks and in blockchain. They have invested in organizations which will be active in this market.	
Interests and Expectations	**Motivations**
Business interests:	
- Run the infrastructure. - Interested in international eco-systems. - Create a market for their subsidiaries to succeed in. - Create a secure market.	- Financial gains. - To keep their reputation.

Description: Bank	Type: Organization
Roles:	
This bank is a startup and at the time of the interviews was in the process of getting a bank license. They are responsible for bank related topics in the consortium and want to have a strong position on the market they are co-creating.	
Interests and Expectations	**Motivations**
Business interests:	
- Create a market which turns non-bankable products into bankable products. - Interested in onboarding partners to create the market. - Interested in collaborating with renown partners. - To be a custodian for the market they co-create. - To offer access to this market for regulated financial institutions.	- This creates new business opportunities and they want to be a leader in that area. - They do not have all the necessary knowledge to create the market themselves. - As a startup they have not established themselves yet. - Financial gains.

4.15.3.   Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Interviewee 01 says that one cannot fully outsource trust to the technology. However, blockchain is used for a market infrastructure which is well run and regulated and helps creating a trusting environment. This interviewee also says that blockchain does not influence the way collaboration happens, because that is dependent of the people who are involved and their trust between each other, common vision, will to compromise, and openness. But blockchain has the characteristic that it is usually most effective when many parties decide to collaborate. Meaning that to gain the most from the technology, it can require more preparation to get all stakeholders together and form a consortium. If a blockchain project fails, it is very likely that it did not fail due to the technology, but due to an issue in collaboration.

Interviewee 02 thinks that blockchain does influence how collaboration is done, because blockchain brings organizations together, which usually operate in silos and do not interact closely with each other. This silo operation must change and can be very challenging. Since blockchain is a young technology, it creates uncertainty for the consortium. For example, it is unknown which protocol will become the standard and public perception and misinformation are still a difficulty.

Consortium setup

When setting up the consortium it was intentional, that the three main partners have different areas of expertise, so that the competences complement each other. Furthermore interviewee 02 valued the possibility of having a loose structure, to ensure the possibility of replacing a partner, if needed. Since the partners come from different backgrounds, their individual interests of what they hope to gain from the collaboration defers. Interviewee 01 says that it has been a challenge to ensure that every partner can follow their own interests and not just work for the interests of the consortium. A balance between individual and consortium interests must be found. Also, it is crucial to create a common culture and vision early on, which has been mentioned several times.

Interviewee 02 elaborates on the different members, who all bring their own interests to the consortium. The common vision of the platform is divided into components and every organization pushes their own business case within their component. Since there is no strategic alignment between the partners, a consortium is the optimal collaboration form. If there was a strategic alignment it would be smarter to create a legal entity with the different partners as the shareholders.

The fact that the three partners were able to establish a collaboration is for interviewee 01 the biggest success this far. Especially because two of the members are far larger organizations than the third. The collaboration seems to work, because every partner has the responsibility that their component and business case works. This also allows for each partner to strengthen themselves.

Decision taking / collaboration

The decision taking process of this consortium has its roughness. Reasons are that the consortium did not have an equity-based governance model and did not set up an alternative solution. Additionally, the partners followed their personal interests strongly and with two larger organizations and a smaller third one, the institutions move at different speeds.

Interviewee 01 says that personal relations were very important in the decision-making process. Good personal relations enable:

- Trust that the partner has the right motivations.
- The will to compromise.
- Take difficult decisions together.

Sometimes partners must be patient and open enough to play along when the consortium does not move in the correct direction and still have the trust that one wants to accomplish something with the partners they have.

Employees relation between consortium and employer

The employee assigned to the consortium must have the capability of taking decisions for the employing organization and get things moving. Especially when the interests of the employer must be readjusted.

4.16. C17 – Energy trade between households

4.16.1. Description of the Consortium

The following table introduces the association "C17 – Energy trade between households". The table contains a brief description of the association, the problem the association is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the association.

Table 69: The description of C17. Own representation.

C17 – Energy trade between households	
Description	
This consortium has a similar goal as C06, which is to enable trade of small energy quantities between prosumers. This trade should happen without any middlemen, directly between energy storage and buyer. C06 seems to be more advanced, because the collaboration in C17 is younger and the discussions are on a more theoretical level.	
Why Blockchain?	
The idea to do something with blockchain preexisted the use-case. Blockchain is useful for the traceability of transactions and to run the market in a decentralized manner. The decentralization also enables a better security.	
Members	**Interviewees**
4 Technological partners 1 Business partner 3 Academic partners	01 – Academic partner – Hardware 02 – Business partner – Energy services and trade
Interests and Expectations	**Motivations**
- Enable energy trade between prosumers. - Avoid middlemen. - Gain experience with blockchain.	- Adjust to changing needs, financial gains. - Automation of trades and keep prices low. - Understand the potential of the new technology.

4.16.2.   Stakeholders Interests, Expectations, and Motivations

Table 70 introduces an academic partner and table 71 the energy provider.

Table 70: Description of the academic partner 1 from C17. Own representation.

Description: Academic partner 1	Type: Organization
Roles: Hardware engineering, Create a testing environment	
This academic partner studies intelligent energy systems and is responsible for creating the hardware on which the blockchain system will run. This project fits their research area well, which is the main interest in participating.	
Interests and Expectations	**Motivations**
Business interests:	
- To sell their findings to industry partners.	- Financial gains.
Academic interests:	
- To gain blockchain experience. - To observe the effects of blockchain based marketplaces. - To observe the real-time behavior of voltage.	- To get familiar with the new technology. - Those are their research areas.

Table 71: Description of the energy provider from C17. Own representation.

Description: Energy provider	Type: Organization
Roles: Energy providing expert, consortium lead	
The energy provider is interested in improving their business and partnered up with experts of different fields to check the potential of blockchain. They are not involved in developing the new soft- and hardware, but provide their expertise in energy systems, and have set up a testing environment. They are also responsible for managing the consortium.	
Interests and Expectations	**Motivations**
Business interests:	
- Interested in efficiency gains. - Interested in new business models. - Interested in running the energy trade platform. - Expects follow-up projects to emerge.	- Cost reduction. - Financial gains. - A possible business model. - This project is only the beginning of the blockchain journey.
Technological interest:	
- To check how blockchain could improve their business.	- Blockchain has the reputation of possibly being a disruptive technology.

The interviews do not provide a lot of interests of the other partners. It is known that a second academic partner is involved as a blockchain expert. From the four technological partners there are two who are responsible for the software development and two are responsible for building the hardware.

4.16.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Both interviewees say that blockchain does not change the way people work together. However, it is the reason for these organizations to start collaborating in the first place. Interviewee 02 emphasizes that it is important for the members of blockchain consortia to be open towards the technology, to be ready to take new paths, and to be willing to rethink current processes.

Collaboration

A difficulty mentioned is that the partners had very different backgrounds and areas of expertise. The people needed to be able to understand each other and this was achieved by creating a common vocabulary. This was done during the phase of designing the platform, which was done early on. The common vocabulary enabled that everyone had a clear understanding of the vision of the consortium. Further success factors mentioned are to deal with each other openly and to be willing to compromise. Interviewee 01 emphasizes that the project management is done very well and that it facilitates collaboration greatly.

Interviewee 02 discusses the advantages of collaborating as a consortium, compared to developing the solution alone or by hiring other firms who would contribute to the solution. The interviewee says that their firm would lack the necessary knowledge to build the solution by themselves. This would mean that they would have to hire other organizations, who would bring their knowhow and by hiring them, the interviewees firm would have to manage all these service providers. The hired firms have no incentives to do more or better work than the hiring organization asks from them to do. In a consortium these service providers are incentivized to build the best solution possible, because if the platform succeeds, they can do profits from it. The partners have incentives of doing the best work they can do and to make sure that the part they built is of quality so that it will always stay part of the solution. All partners have a common goal and collaboration is easier.

Consortium setup

The setup of the consortium took some time because every partner had their own interests, which were initially not compatible. To find consensus the organizations talked to each other at length and compromised

until every partner and their legal team agreed. After that contracts were signed and since then the partners feel like a homogenous consortium, where everyone has the same vision and goal.

Decision taking

The representatives of organizations do not have full decisional power for all issues which might come up in the consortium. Interviewee 01 says that this does not create any problems, because most important decisions are not taken in an instant and employees have time to talk about the decisions which must be taken with their management. However, it is important that the employees do have enough decisional power for smaller decisions, which should be able to be taken quickly.

4.17. C18 – Commodity trade platform

4.17.1. Description of the Consortium

The following table introduces the association "C18 – Commodity trade platform". The table contains a brief description of the association, the problem the association is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the association.

Table 72: The description of C18. Own representation.

C18 – Commodity trade platform	
Description	
For this consortium, several banks and corporations came together to create a trade platform for commodity trades. Eventually the consortium turned into its own company and the founding partners are shareholders of this organization. The platform should be an interface between banks and corporates looking for financing commodity trades.	
Why Blockchain?	
Blockchain solves lack of trust in trade. Every participant stays in control of their own data. Good technology to prevent fraud. Immutability of data is crucial.	
Members	**Interviewees**
1 Technological partner 10 Business partners – Financial institutions 6 Business partners – Commodity traders	01 – Business partner – Bank 1 02 – Business partner – Bank 2 03 – CTO consortium
Interests and Expectations	**Motivations**
- Digitization and improve efficiency of process. - Become leading digital platform for financing commodity trades. - Make the platform as open as possible. - Become independent from the technological partner.	- Efficiency gains and reduce cost. - Financial gains. - Become the leading trading platform. - Be in control over their own platform.

4.17.2. Stakeholders Interests, Expectations, and Motivations

The legal entity which has been formed for running the platform is not depicted as a member, because their interests and motivation are described above in the description of the consortium. Table 73 introduces the technological partner, table 74 the banks and table 75 the commodity partners.

Description: Technological partner	Type: Organization
Roles: Initial development	
The technological partner provides development services with Ethereum. They are contracted to develop the solution and have put 5 developer teams on the project. The consortium wants to become independent from the technological partner and end this partnership.	
Interests and Expectations	**Motivations**
Business interests:	
- Sell their development skills.	- Financial gains.
Technological interest:	
- To develop with Ethereum	- They are experienced in Ethereum.

Table 74: Description of the banks from C18. Own representation.

Description: Banks	Type: Role
Roles: Banking expert	
The banks are active in the financing of commodity trades. With the platform they hope to improve their business for the commodity traders.	
Interests and Expectations	**Motivations**
Business interests:	
- To be ready for the future. - To check the data submitted by the users. - Safety of the transactions on the platform. - Digitalization and better communication with the customer. - To collaborate for creating a digitized solution and influence the design.	- To not fall behind on the market. - Ensure correctness of the transactions. - Avoid risks and reputation damage. - Efficiency gains, better customer journey, improve KYC. - One bank alone cannot set the standard, but they still want to influence it.
Technological interest:	
- Gain blockchain experience.	- Understand the new technology.

Description: Commodity traders	Type: Role
Roles: Commodity trading expert	
The commodity traders buy and sell commodities. The commodity traders of this consortium trade oil and they hope to spend less on their financing products.	
Interests and Expectations	**Motivations**
Business interests:	
- To have cheaper financing opportunities. - Digitized systems. - Keep transaction details private. - Operate with a safe and trustworthy system. To control their own data.	- Cost reduction. - Efficiency improvements. - The data is sensitive. - Immutability and avoid fraud.

4.17.3.   Dynamics within the Consortium

Influence of Blockchain on inner dynamics

This consortium is not the first attempt at finding a solution for the business problem they are trying to solve. The previous attempts failed due to the technology and now with blockchain the consortium feels confident that the problem is solvable.

It is reported that blockchain has also its challenges. Since the technology is still young there are hardly any example projects and it changes a lot with frequent releases. Consequently, the technology lacks stability and the enterprises do not like that. To counter this incertitude the solution was built in such a way, that the blockchain framework used could be changed easily. Organizations are also struggling with the data requirements which blockchain brings with it. The organizations did not have to share data and make data available previously. This new handling of data creates internal discussions but are crucial for a successful collaboration.

The people involved in the project are excited to work with a new and hyped technology. The project is experimental in nature and the participants are cooperating easily. Interviewee 03 says that they have "[…] never spent as much time in otherwise competitive labs of other banks than in that time. So I often say blockchain technology has already had its key value for the community. And that is that it removed the hurdles of competitions between parties. Because blockchain drives you towards a common understanding that you need to share with a group and there's no point in building a blockchain network or platform by yourself. You need other players to work with you. So this technology will bring you to the table, to really discuss matters that were otherwise be not discussed between these parties." (C18_03, Pos. 143-144) Blockchain changes the way companies are talking to each other today. Then again, interviewee 02 says that blockchain does not change the way collaboration is done, since it is only a tool.

The public needs to be educated on the technology, especially since currently blockchain has a mixed reputation. Interviewee 02 fears that the public will hesitate to join such a platform until acceptance has arrived, which can take some time.

Hack / Fraud

This organization has set up a business continuity plan in case a hack or a fraud takes place.

Founding

The consortium started as a loose partnership and was funded by the members. Early on every member had the possibility to leave if they wanted to. Once the legal entity was formed the members took an investor role and became board members of the company. Interviewee 02 sees a strength of this partnership, that the solution is very niche. This made it easier to set up a common vision, since the participants are similar minded. Interviewee 01 says that it is important to start with a small number of partners for a PoC. Once that works, open the consortium for more partners to join. Ideally every role within a process or supply chain should be represented. Interviewee 02 recognizes that having both banks and corporate users being part of the consortium is a strength for this collaboration. The initiators made sure that all partners have a leading position in the market.

Interviewee 01 emphasizes the importance of finding a common ground early on and the willingness to compromise, since all organizations have different habits, rules, and interests. This is done through negotiation and defining acceptance criteria. For important stages of the project two-day workshops are done.

Decision taking

By setting up a company the consortium ensured that there is a separate management which is independent of the members and 100% dedicated to the platform. This ensures that the management of the company can make decisions and make recommendations to the board that are in the interest of the platform. The company's governance consists of three bodies: management, board of directors and shareholders' meetings. Interviewee 02, who is on the board of the blockchain company and is employed at one of the banks says that they strictly divide the two positions. Board members must act in the interests of the company and not of the employer. When the company was formed it was defined which decisions are taken on which level, the more important the decision, the higher up it is taken. Management being the lowest and shareholders' meetings the highest level. The company holds a monthly 'business spec' meeting where the new business roadmap ideas are presented to the members and feedback is given. The goal of the meeting is to get advice by the members to set priorities and confirm that the interests of the members are met within the 'business spec'.

In this stage it is the people from the company who take the final decision of what is done next, since the members only give advice.

Collaboration with competitors

Interviewee 01 explains that the collaboration between competing members is no issue, because they have a system view, where either everyone aspires for success for the network or the network is a failure. The business competition does not interfere with building a network. The banks compete in sales, but sales is not involved with building the network.

Interaction company and investing members

Interviewee 03 who is the CTO of the legal entity formed by the consortium says that it is challenging to interact with all the members on an individual level. Every organization has their own expectations and want to hear some specific answer. Within every member organization there are plenty of roles who want to know different things and these roles need to be addressed differently. To communicate properly with every stakeholder requires a lot of precision and concentration.

Consortium and regulations

Interviewee 01 says that regulations do not constrain the work, because they have been set up with the purpose of avoiding human greed, fraud, and other misconducts. Regulations need to evolve with the technology and should keep its role. By onboarding regulatory parties, the evolving can be accelerated. Interviewee 03 emphasizes the additional benefits the technology brings to safety and reliability. They think that the regulators should recognize and reward the usage of such platforms.

4.18. C19 – Mobility as a Service platform

4.18.1.   Description of the Consortium

The following table introduces the association "C19 – Mobility as a Service platform". The table contains a brief description of the association, the problem the association is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the association.

Table 76: The description of C19. Own representation.

C19 – Mobility as a Service platform	
Description	
The goal of this collaboration is to research how an eco-system of mobility as a service (MaaS) providers could be created using blockchain. Unlike other projects, the development of a blockchain solution was never intended, only the theoretical perspective was of interest. Many MaaS providers operate very locally, which can be limiting for the user. By creating an eco-system, they hope to improve the interconnectivity.	
Why Blockchain?	
Gain experience with the technology. To compare blockchain to non-blockchain solutions. A decentralized solution can counter monopolistic structures.	
Members	**Interviewees**
1 Technological partner 1 Academic partner	01 – Technological partner 02 – Academic partner
Interests and Expectations	**Motivations**
- Understand the potential of blockchain. - Improve the MaaS market. - Avoid monopolistic structures.	- Improve the MaaS market. - It is a growing market with potential. - Have competition in the market.

4.18.2.   Stakeholders Interests, Expectations, and Motivations

Table 77 introduces the technological partner and table 78 the academic partner.

Table 77: Description of the technological partner from C19. Own representation.

Description: Technological partner	Type: Organization
Roles: Mobility expert, Practice partner	
The technological partner positions itself as an IT service provider for communal entities and mobility. In this collaboration they are responsible for identifying the challenges and dynamics of the MaaS market. They are also responsible for finding business models for the new system.	
Interests and Expectations	**Motivations**
Business interests:	
- Interested in examining the possibility of an interoperable platform for the consumption of MaaS. - Interested in creating a standard data transfer interface for MaaS providers. - For the research to be funded by the government. - Not interested in doing the technical development of the platform by themselves.	- The lack of interoperability between MaaS providers is a market gap that they identified. - The lack of standards makes it impossible to integrate numerous MaaS providers. - Financial support. - They think they are too small to develop the platform.

Table 78: Description of the academic partner from C19. Own representation.

Description: Academic partner	Type: Organization
Roles: Consortium lead, Technological research	
The academic partner is better informed about blockchain and its use cases. With that knowledge their role is to understand how a blockchain platform could be set up for the MaaS industry.	
Interests and Expectations	**Motivations**
Academic interests:	
- Analyze the feasibility of a Maas platform. - For the research to be funded by the government. - Having a knowledgeable partner in mobility.	- To publish research and to gain knowledge in mobility. - Financial support. - They lack knowledge in mobility.

4.18.3.   Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Interviewee 02 thinks that blockchain improved the team spirit and the involved people view the solution as an open system where everybody profits. Interviewee 01 does not think that blockchain changed the way that

collaboration was done. The biggest expected difficulty for DLT and mobility as a service is to ensure scalability and establishing business models.

Collaboration challenges

The consortium members interviewed the MaaS providers and did not see in them the will to join a consortium to collaborate with competing MaaS providers. They want to be in control of such a platform, set the standards and not have to share ownership. Interviewee 01 thinks that either the platform must be set up by a neutral party like the government or that the return on investment and the business model of the platform must become clearer.

Collaboration

Both the academic and the technological partner understood that they come from different backgrounds and the implications of this. Each partner had their role and complemented each other, which allowed a good collaboration. If any decisions or challenges arose, they called each other and discussed the subject to find the best possible solution. If management had to be involved for certain decisions, the employees on the project would prepare the topic as far as possible and present the situation to management.

Interviewee 02 says that working in a consortium requires far more communication than working on a project within their organization. Which means that this form of collaboration takes more effort in communications.

Challenges for employees

The employees assigned to the project have the double burden of working for the consortium and their day to day job. It is difficult to balance priorities.

Members of consortium

Since this is a very small consortium, which should test the feasibility of the blockchain platform, not all required actors to get the platform built were part of the consortium. When asked who should be part of the consortium interviewee 02 says that the technological provider should be part of it and can vote. The business partners must be part as o fit as well and if possible, include the regulators to get their input.

4.19.   C20 – Improve trade financing (2)

4.19.1.   Description of the Consortium

The following table introduces the association "C20 – Improve trade financing". The table contains a brief description of the association, the problem the association is trying to solve, why blockchain is used, a list of members, which roles were interviewed, and the interests and motivations of the association.

Table 79: The description of C20. Own representation.

C20 – Improve trade financing	
Description	
The case C10 merged into this consortium. This consortium turned into its own company, with 12 banks as its shareholder and it operates in the EEA. The goal of this group is to improve trade financing by creating a blockchain platform on which banks and corporations can come together.	
Why Blockchain?	
Safety through distributed systems, immutability, and encryption. Also, smart contracts ensuring process safety. Many actors will be involved with the platform, distributed systems create trust and allows the actors to collaborate. Avoid a central institution.	
Members	**Interviewees**
1 Technological partner 14 Business partners – Banks	01 – Manager at the new company 02 – Business partner – Bank
Interests and Expectations	**Motivations**
- Independence from the technological partner. - To build the platform as quickly as possible. - Improve the trade financing business. - Open the system for other banks.	- Limiting the power of the technological partner. - The members strongly believe in the platform. - Financial gain. - Network effects.

4.19.2.   Stakeholders Interests, Expectations, and Motivations

Table 80 introduces the banks and table 81 the technological partner.

Description: Banks	Type: Role
Roles: Banking experts, regulatory experts	
The banks are interested in improving the trade financing process, to offer financial products in that business segment to smaller clients. They are active in different geographical markets, which reduces competition within the consortium.	
Interests and Expectations	**Motivations**
Business interests:	
- Improve the trade financing process. - To build the platform as quickly as possible. - The platform should be safe. - Believe that open markets are the future.	- Reduce costs, efficiency gains, and to fill a market gap. - To see returns on their investment and due to budget limitations. - The data is sensitive, and they have a reputation to protect.
Technological interest:	
- Interested in creating useful blockchain applications.	- Gain experience with blockchain and have a meaningful output.

Table 81: Description of the technological partner from C20. Own representation.

Description: Technological partner	Type: Organization
Roles: Develop the solution	
The technological partner was hired to develop the solution and is not part of the legal entity which has been created. After having built the solution they still run and maintain the platform.	
Interests and Expectations	**Motivations**
Business interests:	
- Sell the framework they have built. - Run and maintain the platform.	- Financial gains.

4.19.3. Dynamics within the Consortium

Influence of Blockchain on inner dynamics

Interviewee 02 does not think that blockchain changes the way people collaborate, arguing that working as a consortium is not unique to blockchain. They did observe that the people who want to work with blockchain are interested and have the mindset of wanting to build an open system.

Decision taking

By having a separate legal entity, this collaboration has put up a strong governance between the legal entity and the members. The strong governance allows operating in a more agile and fast environment. The legal entity operates independently following the strategic guidelines of the shareholder banks. When decisions are taken, where a technological perspective is crucial, the technological partner is involved even though they are not part of the legal entity. The shareholders try to have as much consensus as possible between each other, however there are rules in place regarding majority votes.

Collaboration as competitors

Interviewee 01 says that for all blockchain-based projects one needs a certain network effect to be successful. The participating organizations want to be part of that network and collaborate to compete. The banks are active in different geographic regions, which allows them to not be overly competitive to each other. Still the banks do not discuss with each other how commercial agreements with customers are done and how the platform is charged to the customers.

Challenge to succeed

For interviewee 01 the biggest challenge is to go from an idea to something real. Going from one stage to the next and get the company to stand on its own feet, making sure that everything is right.

Disadvantages of consortia

By being set up as a consortium, no organization has exclusivity rights to the solution built, which would give an advantage on the market. But the members believe that exclusivity is a concept of the past and accept the situation as it is.

4.20. Cross-case Summary

In this section the results presented above are consolidated in a cross-case manner.

4.20.1. Observed Participants and Roles

The large majority of the participants in the cases studied are business organizations. Most businesses are for-profit, some non-profit have also been part of the collaborations. Academia is represented regularly and could either be private or public institutions. Governmental agencies are found in a few cases.

The industries the business organizations are in are diverse. The business organizations often aim to be a market leader within their industry and are simultaneously a sizable player (e.g. C04, C10). Some of the business partners are start-ups trying to establish themselves through the collaboration (e.g. C12). The relation between the businesses could be a buyer-seller relationship (e.g. C12), them being competitors (C10), or being part of the same eco-system (e.g. C01). In several cases the technological provider is integrated in the collaboration (e.g. C01, C10). That member is not in one of the three relationships named earlier. Sometimes they act as an external vendor (e.g. C15) and sometimes they take a more central role in the collaboration (e.g. C01, C04). Occasionally consultants are part of the collaborations (e.g. C03, C11), their relation to the consortium is comparable to the technological providers. Academia is used for guidance and research on the best way to implement the solution (e.g. C01, C02). The role of being a middle ground for the partners to meet can be taken by academia or technological partners (e.g. C01, C04), but the role does not always seem necessary.

4.20.2. Observed Interests, Expectations, and Motivations

The interests, expectations, and motivations have been consolidated using the 13 motives introduced in chapter 2.2.2. where possible. Motives which do not fit in one of the 13 categories are shown in the table 83. In the collaborations studied 'efficiency', 'innovation', and 'learning, capacity building' are motives identified in a large majority of cases. Other common motivations for collaboration are 'the legitimacy motive', 'access to and leveraging of resources', and 'service quality'.

Table 82: Summary of motives from literature found in the results. Own representation.

Nr.	Motive	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
1	The necessity motive					x				x			x							
2	The asymmetry motive			x																
3	The reciprocity motive		x		x								x	x						
4	The efficiency motive		x	x	x	x	x	x	x	x	x	x		x	x		x	x	x	x
5	The agility motive																			
6	The innovation motive		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	The stability motive				x	x						x								
8	The legitimacy motive		x	x		x	x					x		x	x					
9	Access to and leveraging of resources			x						x		x		x		x				
10	Shared risk			x	x															
11	Learning, capacity building		x	x		x	x	x		x	x	x		x		x	x	x	x	
12	Positive deviance					x						x			x					
13	Service quality		x		x				x			x	x		x			x		

More interests, expectations, or motivations have been identified, which do not fit in the 13 motives above, originating from literature. 'Independence of individual partners' describes the interest of not creating dependencies, by collaborating with other parties. For example, that the technological partner should be replaceable. The motive 'network effects' means that participants are interested in having a high number of users using the solution created by the collaboration. This was mostly present in cases where a trading platform is built. 'Data privacy or security' describes the desire of participants to ensure the safety and control of their data. This was a concern in nearly all the collaborations. While many organizations joined a consortium to learn or innovate using blockchain, others joined due to the fear of missing out. In several occasions, participants said that they are interested in co-setting the standard of the solution being built, which falls under 'influence design of solution'. Some organizations are motivated to collaborate, because they are going to have a head start on competitors once competitors may join the solution resulting from the consortium. One consortium has a strong interest of using the gained experience to guide law makers on how to set up new laws optimally. Some participants of other consortia have expressed the same interest but are not as active on that front as C06.

Table 83: Summary of motives found in the results not included in the literature background. Own representation.

Motive	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
Independence of individual partners				x						x					x		x		x
Network effects		x	x			x		x	x	x					x		x		x
Data privacy or security		x	x		x	x	x	x	x	x	x		x	x	x	x	x		x
Influence design of solution		x		x					x		x	x					x		
Head start		x					x		x										
Influence law makers							x												

4.20.3.   Observed Dynamics

The first two tables give an overview of the topics shown in the dynamics section of the results. The first table includes more general topics, while the second table includes dynamics which are more dependent on the specific case. Just because a case has certain topics not marked it does not mean that the consortium did not have any dynamics within that topic.

Table 84: Summary of inner dynamics presented in the results. Own representation.

Dynamic	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
Influence of blockchain on inner dynamics		x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x
Consortium setup (founding)			x					x							x	x	x		
Choice of partners				x						x			x	x				x	
Common vision / compromise			x		x	x	x		x										
Antitrust and collab. with competitors					x			x		x			x				x		x
Collaboration structure		x		x		x	x		x		x	x		x		x		x	
Decision taking		x				x		x		x					x	x	x		x
Collaboration difficulties		x		x	x				x	x	x					x		x	x
Success factors								x			x								
Employee stress										x					x			x	
Managing regulatory compliance							x	x	x								x		
Internal communication		x																	
Committing resources					x														
Legal form / creating a subsidiary					x														
Middle ground					x														

The most discussed and observed dynamics include the influence of blockchain on inner dynamics, collaboration structure, decision taking, collaboration with competitors and collaboration difficulties. Interviewees often reflect on dynamics in the formation and development and growth phase of the consortium. Especially the formation phase gets a lot of attention. Besides collaboration there are observations in the areas of 'employee stress', 'regulatory compliance', 'resource commitment' and the 'middle ground' dynamic. Furthermore, four dynamics have been observed which are specific to the collaboration they have been observed in. While these dynamics could be observed in other collaborations, they are rarer and require a specific setup. C01 has a business case which strongly relies on network effects to happen and resulting dynamics are shown. C10 and C20 merged, all information to the merger is shown in C10. C12 has insights regarding dynamics of a collaboration between a startup and two established organizations. C17 has formed a subsidiary organization resulting from the collaboration. The interactions between investors, also known as consortium participants, and the subsidiary are shown.

Table 85: Summary of inner dynamics presented in the results which are more case specific. Own representation.

Case specific	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
Missing network effects		x																	
Merger with another consortium										x									
Dynamics between different sized actors												x							
Interactions subsidiary + investors																x			

Table 86: Summary of challenges from literature found in the results. Own representation.

Challenges	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
Achieving consensus on and varied commitment to network purpose and goals		x	x		x				x		x					x			
Culture clash, or competing "institutional logics"											x				x		x		
Loss of autonomy															x				
Coordination fatigue and costs, including being pulled in multiple directions		x			x						x							x	
Developing trusting relationships			x								x								
Obstacles to performance and accountability		x																	
Management complexity		x															x		
Power imbalance and resulting conflict																			
Lack of organizational capacity to work collaboratively											x								
Sustainability									x										x

The table above reuses the challenges from chapter 2.2.3.3. and marks the cases where the challenge effectively posed sufficient problems for it to be classified as a challenge and mentioned in the results. For example, 'achieving consensus' is required in every case but if a consortium handled it well, without running in the difficulty at first, they are not marked. Many of the situations listed as a challenge have been observed but were managed well. Interviewees also emphasized that it is important for consortia to manage these situations well or else they end in the challenges observed in literature.

In the projects observed the challenge to achieve consensus was a common difficulty. Another common issue is the challenge that employees often not only work on the consortium project and have a day-to-day job to fulfill, which is reported as 'being pulled in multiple directions'. Several challenges are barely observed. Culture clash usually was not a problem, interviewees report that blockchain requires an open mindedness and therefor organizations often worked well together. 'Trusting relationships', 'lack of organizational capacity to work collaboratively', 'loss of autonomy' and 'power imbalance' were also rarely an issue for the same reason. Sustainability, which is about being able to get the consortium to the next phase, was a challenge touched by different interviewees but rarely discussed extensively.

In the table below there are challenges listed, which do not fit in the challenges list introduced in the literature section. Three cases mentioned the difficulty of working with heterogenous partners is that the expertise and knowledge is diverse and needs to be leveled. Members not working at the same speed was mentioned as a challenge in C01. Cases with startups had comparable dynamics but did not see it as challenging. While several projects started from the interest of doing something with blockchain instead of having a use case requiring blockchain only C02 had effective challenges resulting from that issue. In few cases competitors collaborated even though they had competing and not complementary interests. C05 found it challenging to promote their project due to the mixed public reputation of the technology. C05 also reports on difficulties to find the correct monetization strategy for their solution. Several cases also reported on this issue but less extensively. People struggled with conceptualizing use cases for blockchain since the possibilities blockchain offers are foreign to everyday people. Additionally, there are very few example use cases for blockchain and therefor it is difficult to compare ideas to existing projects. Blockchain is not mature yet and technological difficulties are faced by the consortia.

Table 87: Summary of motives not included in the literature background but found in the results. Own representation.

Other Challenges	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
Different expertise & knowledge level		x		x												x			
Members work at different speeds		x																	
Technology first, use case second			x																
Competitors with conflicting interests			x				x												
Mixed reputation of blockchain						x													
Monetization of the solution						x													
Recognize blockchain potentials / think outside the box								x	x	x									
Technical difficulties									x				x	x	x		x		
Lack of reference cases									x								x		

Numerous interviewees share the perception that blockchain has no influence on the way collaboration is done. In their view all inner dynamics are typical for projects and inter organizational collaboration and are a result from people interacting. They say that blockchain is just a tool, the underlying technology and nothing else. Other interviewees have attributed certain inner dynamics to blockchain. Both stances are observed within cases, meaning that there is a different perception of the role of blockchain between participants of the same consortium.

Interviewees who attribute inner dynamics to the blockchain technology give following observations. The hype of the blockchain technology is a motivation for organizations to collaborate and commit resources. To work with blockchain the (business) partners need to be educated regarding the possibilities of the technology.

Blockchain enables new relationships between actors of different interests, mindsets, and ideas. Simultaneously this means that different cultures meet, and cultural transformation happens. Blockchain helps organizations to bond, due to it being the common interest and touching point. Additionally, it highlights pain points or gaps in processes, to which they were blind before. "[Blockchain] enables to revise the business how we do it now. If you don't know that you have a problem, you don't have a problem. Until something happens that shows you that you have a problem, and then you want to find the solution" (C08_I03, Pos. 134). The interviewees recognize now that there is always something to optimize. People struggle with thinking within the new realms blockchain unlocks. For organizations to agree on a common vision when collaborating is especially crucial with blockchain. Blockchain forces organizations working in silos to change their structures. One interviewee says that blockchain removes the hurdles of competitions between parties because organizations understand that blockchain solutions work best as a inter organizational collaborations.

5. Discussion

The discussion aims at answering the research questions and the goals of the study. The answers include a look at the results and a literature comparison to identify whether the results are specific to blockchain or not.

5.1. RQ0: Stakeholder Analysis

The research question 0 asks how interests and expectations of different stakeholders can be analyzed. This RQ is implicitly answered with the literature background and the methodology in chapters 2 and 3. The discussion here serves as a final comparison between the key characteristics of the stakeholder analysis performed, compared to possibilities presented in literature.

In literature approaches are described for top-down stakeholder analysis and methods of collecting and sorting data for bottom-up approaches. Within this analysis the data is given and covers a broad range of information. Since the data is given, it means that a bottom-up method should be followed. Bottom-up frameworks must be designed sufficiently open to include the wide range of answers provided by the interviewees. Additionally, since the data collection is aimed at collecting more data than what is needed for a stakeholder analysis, it is not possible to follow a standard procedure for the stakeholder analysis. With these preconditions a custom framework is designed for absorbing the data and typical components of stakeholder analysis frameworks are included in the design. Typical components are the identification of stakeholders and their interests.

5.2. Roles and Organizations

This part of the discussion does not answer a specific research question but reflects on a goal of this analysis. The goal is to understand whether the participants of blockchain consortia are typical partners of inter organizational collaborations or if there are partners or roles which have not been observed before. From the results it is known that the collaborations consist mostly of business organizations and there are often purely technological partners involved who are either part of the collaboration or only service providers. Usually in bigger cases academia is involved and in certain collaborations there are governmental agencies. Some cases also have consultants.

In the summary of the results, which is in chapter 4.20.1., there are numerous observations on the business organizations. These observations are discussed here. The first observation is that in several cases the organizations aim to be a leader within their industry and often already have a leading position in the market. These businesses often join to be ahead of the curve and set the standard of future services. This drive to be a leader and willing to take risks fits with the observation done by Park (1996) that inter organizational networks are a suitable form for entrepreneurs to advance their business. Not all business organizations are established market leaders. Some are small organizations going through their startup phase collaborating with

established businesses. In cases with smaller and often young business organizations they enter a collaboration with established and leading organizations to set foot, emit trust towards third parties and grow. This relation has been observed by Park (1996) as well.

Different relationships are observed between the business organizations represented in a blockchain consortium. Besides consortia 03 and 19, the relationships between the business organizations of consortia can be assigned to either being in a buyer-seller relationship, the businesses being competitors or that they are in the same eco-system and not in one of the first two relations. The eco-system relation is defined as follows: the touching point of the businesses is in the markets they act on. The services the businesses offer are independent from the other collaborators. The business organizations serve the same client. It is possible that there are competing businesses within an eco-system, which allows network effects.

In Hong's framework collaborator relations can only be classified as buyer-seller (vertical) or competitors (horizontal). As shown in the table below there are numerous cases where the collaborators are part of an eco-system and do not fit Hong's model. There are two cases where both a buyer-seller relationship and a competitor relationship exist. C04 is a remarkable example of this relationship where an entire industry of seller-buyers and competitors join to collaborate, which is reasonable since, as is shown in chapter 4.20.2., they join from a necessity motive.

Case 03 has not been categorized since the entire collaboration is a buyer seller relationship between two parties and the buyer will be the sole owner and user of the solution. Case 19 is a feasibility study for business organizations, which are not actively participating in the study.

Table 88: Classification of relaions found in the studied cases. Own representation.

ID	Name given	Buyer-Seller	Competitors	Eco-system
C01	Data market for the car eco-system			x
C02	OTC trading platform			x
C03	Land Registry	-	-	-
C04	Track and trace of pharmaceuticals	x	x	
C05	ERP system for SME e-commerce			x
C06	Peer-to-peer energy trading	x		
C08	Service platform for shipping			x
C09	Data market for patient health data			x
C10	Improve trade financing		x	
C11	Health insurance approval			x
C12	Temperature tracking of deliveries	x		
C13	Bank Blockchain community		x	
C15	Track fish from fisher to consumer	x		
C16	Trade platform for previously non-bankable products			x

C17	Energy trade between households	x		
C18	Commodity trade platform	x	x	
C19	Mobility as a Service platform	-	-	-
C20	Improve trade financing (2)		x	

In many cases a technological provider is involved, which is not inherently part of the industry the business organizations are active in. The technological partners are in some cases part of the network and in other cases stay as an external service provider. For technological partners to be part of the network does not fit with the framework introduced by Hong. When consultants are included in the network, they usually are not part of the consortium. Only in C09 they are actively part of the consortium. In several cases an academic partner is included in the consortium. Their role is to support the development and design of the solution by providing insights from the newest academic findings. Academia does also not fit in Hong's framework.

Below is a table where the topics discussed in this chapter are categorized in one of three categories. The categories are:

a) 'Known from literature': This topic is known and presented in the literature background.
b) 'Found in literature': This topic was not documented in the initial literature used for the literature background, but the topic is reported in literature.
c) 'Insufficient documentation': This topic is insufficiently documented in literature.

The cooperation between academia and business organizations is usual in innovation and knowledge intensive projects, as has been reported by Valentin and Jensen (2006). The International development innovation alliance (n.d.) (IDIA) describe innovation ecosystems where multiple and interconnected actors work together to innovate. The collaboration within an eco-system, which does not limit itself to buyer-seller relationships or competitors is not unique to blockchain. An observation which lacks literature are consortia which include service providers in the decision taking process, even though the service providers are not interested in the use case of the solution. For example, in C10, while the technological partner is excluded from decisions where they have a conflict of interest, they were usually part of decision taking processes.

Table 89: Classification of results according to representation in literature. Own representation.

Known from literature	Found in literature	Insufficient documentation
Market Leader / Entrepreneurs	Academia involved in inter organizational collaboration.	Service providers included in the network.
Small business organizations collaborating with established organizations.	Collaboration within eco-system	Collaboration including an entire industry.

5.3. RQ1 and 2: Interests, Expectations and Motivations

The research questions 1 and 2 are discussed in the same chapter, due to their close relation. Since literature looks more at the motives than at particular interests, the motives are the focus point of this discussion.

RQ1: What are the interests and expectations of consortium stakeholders?

RQ2: What motivates the interests and expectations?

In chapter 2.2.2 13 motives have been introduced which are commonly found in inter organizational collaboration. The table below was introduced in chapter 4.20.2 and matches the found motives with the motives from literature. The motives 'efficiency', 'innovation', and 'learning, capacity building' are observed in most cases. Other common motivations for collaboration are 'the legitimacy motive', 'access to and leveraging of resources', and 'service quality'.

Table 90

Nr.	Motive	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
1	The necessity motive					x				x			x							
2	The asymmetry motive			x																
3	The reciprocity motive		x		x								x	x						
4	The efficiency motive		x	x	x	x	x	x	x	x	x	x		x	x		x	x	x	x
5	The agility motive																			
6	The innovation motive		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7	The stability motive				x	x						x								
8	The legitimacy motive		x	x		x	x					x	x	x			x			
9	Access to and leveraging of resources			x					x			x		x		x				
10	Shared risk			x	x															
11	Learning, capacity building		x	x		x	x	x		x	x	x		x		x	x	x	x	
12	Positive deviance					x						x			x					
13	Service quality		x		x				x			x	x		x			x		

The efficiency motive is so widespread since IT systems allow automation and more precision. In some cases, the processes being reworked are done manually and the digitization alone is a big improvement in efficiency. Furthermore, smart contracts allow automated transactions in blockchain systems. The motive 'innovation' includes besides innovation also value creation. All cases are either trying to find innovative solutions or achieve financial gains. Therefore, that motive has been identified in all cases. Motive 11, 'learning, capacity building' is also a common theme with blockchain consortia. Many organizations join to learn about the technology, especially since it has been hyped. Legitimacy is relatively common as well. Organizations have joined the collaboration to check out the hype around blockchain and to be able to report that they are working on projects which include blockchain. The positive deviance motive is manifested by organizations wanting to change their corporate culture to be more future oriented and open for new systems.

Some motives seem to be present implicitly and were rarely mentioned by interviewees. The 'shared risk' motive was mentioned in C02, which is the case that failed. The interviewees are glad that they had partners

in the project and shared the investment cost with others. That way the loss in investments stayed bearable. It is likely that for many cases the shared risk motive also played a role but was not mentioned explicitly. The motive 'access to and leveraging of resources' is also believed to be underrepresented in the results. In all projects it would not be possible for a single organization to design and develop the entire system by themselves. The 'reciprocity' motive is rarely mentioned explicitly. In most cases the participants are aligned with their goals and share a common vision, which implies that reciprocity exists.

The 'asymmetry' motive means that an organization joins to exert power or control over other organizations. In C02 it is said that the market access provider backstabbed the partners, however since the interview data in that case is one sided, it is unclear whether that statement can be trusted. The agility motive has not been observed.

Motive	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
Independence of individual partners				x						x					x		x		x
Network effects		x	x			x		x	x	x					x		x		x
Data privacy or security		x	x		x	x	x	x	x	x	x	x		x	x	x	x		x
Influence design of solution		x			x				x		x	x					x		
Head start		x					x		x										
Influence law makers							x												

The table above is also taken from chapter 4.20.2 and contains motives, which are not included in the 13 categories from literature. The original 13 motives are limited to the reasons why an organization would join an inter organizational collaboration and does not include more general interests of organizations like data privacy and security, which is an interest in all cases but three. There are several instances where interviewees said that their motivation to participate is to co-design the solution and to be able to decide on the standard which will be used in the future. Similarly, some organizations view the participation as a head start over competitors, which might join the solution later once it is live. With the head start they expect to be able to offer the best services and strengthen their market position. A popular interest is labeled as 'network effects', which is mostly found with trade platforms and solutions for entire eco-systems. These platforms work best when many users use them, which explains the interest. For five cases participants have said that it is important to not rely on a single partner and that they wish to ensure an independence between the partners. The most common interest is that the technological provider could be exchanged. In other cases, participants wish that any member of the consortium could be exchanged with a competitor. This notion goes against the motive 'stability' provided by literature. In one case it was mentioned that an interest of the consortium is to enter discussions with law makers to design laws which are compatible with blockchain.

Below is a table where the topics discussed in this chapter are categorized in one of three categories. The categories are:

a) 'Known from literature': This topic is known and presented in the literature background.

b) 'Found in literature': This topic was not documented in the initial literature used for the literature background, but the topic is reported in literature.

c) 'Insufficient documentation': This topic is insufficiently documented in literature.

Table 91: Classification of interests and motives according to representation in literature. Own representation.

Known from literature	Found in literature	Insufficient documentation
Necessity	Network effects	
Reciprocity	Independence of partners	
Stability	Data privacy or security	
Access to and leveraging of resources	Head start	
	Influence design of solution	
Shared risk	Influence law makers	
Positive deviance		
Service quality		
Efficiency		
Innovation		
Learning, capacity building		
Legitimacy		

5.4. RQ3: Inner Dynamics

The third research question is about the inner dynamics of a consortium and asks the following question:

RQ3: What are the implications of interests and expectations on the consortium's work?

In the summary of the results, which is in chapter 4.20, it is shown that most inner dynamics originate from how the participants collaborate. A strong emphasis is on the phases of formation and development and growth of the consortia. In the discussion the challenges are discussed first, then other dynamics identified and lastly the influence of blockchain on inner dynamics. The tables summarizing the challenges are reintroduced below.

Challenges

Table 92: Challenges from literature observed in the cases analyzed. Own representation.

Challenges	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
Achieving consensus on and varied commitment to network purpose and goals		x	x		x				x		x					x			
Culture clash, or competing "institutional logics"											x				x		x		
Loss of autonomy															x				
Coordination fatigue and costs, including being pulled in multiple directions		x			x					x								x	
Developing trusting relationships			x								x								
Obstacles to performance and accountability		x																	
Management complexity		x															x		
Power imbalance and resulting conflict																			
Lack of organizational capacity to work collaboratively											x								
Sustainability									x										x

For the challenges identified in literature there are several which are very present with the blockchain consortia studied and other challenges have hardly been observed. The 'achieving consensus' is a necessity highlighted in most consortia. Not all faced any challenges with it, because some consortia handled this well from the get-go. An interviewee believes that due to the heterogenous backgrounds and interests of the participating organizations the need to find consensus takes more active work. The 'coordination fatigue' challenge is mostly represented by employees being pulled in multiple directions, due to them having a day-to-day job besides working for the consortium. Even though sustainability has only been identified as a larger challenge in two consortia, it was found in several cases that a difficulty going forward is going to be to not end the project after accomplishing a prototype, but being able to go live. In several cases it has been emphasized that the size of the consortium is crucial. If not enough partners are included, then the design of the solution will miss important feedback by relevant organizations. However, if too many partners are part of the consortium the management complexity and coordination fatigue would complicate the collaboration. The blockchain projects analyzed often aim at revolutionizing an entire market, which would include numerous organizations to participate. In that sense management complexity has been recognized as a hurdle for creating the perfect blockchain solution for new markets, but management complexity was not a major challenge for most of the cases since they often stayed relatively small.

Several challenges identified in literature are rarely present in the blockchain consortia observed. For example, culture clashes have rarely posed any problems. The observations are that blockchain requires an openness to collaborate in the first place and people are motivated to gain experience with the exciting technology, that organizations often got along well and rarely struggled with developing trusting relationships. Additionally,

organizations usually did not act on power imbalances, since they recognized the value of including all partners in a fair manner. Due to the willingness to collaborate the loss of autonomy has hardly ever been observed and organizations usually had the capacity to collaborate. The challenge 'obstacles to performance and accountability' has barely been observed, it is not understood why that challenge lacks presence in the cases observed.

In the table below further challenges are noted, which are not allocable to the previously discussed challenges identified in literature. 'Different expertise & knowledge level' have been observed due to the participants having heterogenous backgrounds and experiences with the blockchain technology. In some cases, it was a challenge to create a leveled knowledgebase between the participants. A further challenge is that not all participating organizations move and work at the same speed. While this is true for several cases only in case 01 this created a challenge. In other cases where for example a startup works with established players the differences were obvious and managed. Several projects originated from the wish to create something with blockchain and blockchain was used as a solution looking for a problem. In one case this did not work out. The rest of the challenges are discussed in the next to sections of this discussion.

Table 93: Challenges observed which are not in the literature background. Own representation.

Other Challenges	Case	01	02	03	04	05	06	08	09	10	11	12	13	15	16	17	18	19	20
Different expertise & knowledge level		x		x												x			
Members work at different speeds		x																	
Technology first, use case second			x																
Competitors with conflicting interests			x				x												
Mixed reputation of blockchain						x													
Monetization of the solution						x													
Recognize blockchain potentials / think outside the box								x	x	x									
Technical difficulties									x				x	x	x		x		
Lack of reference cases									x								x		

a) 'Known from literature': This topic is known and presented in the literature background.

b) 'Found in literature': This topic was not documented in the initial literature used for the literature background, but the topic is reported in literature.

c) 'Insufficient documentation': This topic is insufficiently documented in literature.

Table 94: Classification of challenges according to representation in literature. Own representation.

Known from literature	Found in literature	Insufficient documentation
Achieving consensus	Different expertise & knowledge level	
Coordination fatigue	Members work at different speeds	
Management complexity	Technology first, use case second	
Sustainability	Competitors with conflicting interests	
	Bad reputation of system requires extra signaling effort.	
	Thinking outside the box	
	Technical difficulties with immature technologies	
	Lack of reference cases	

Remarkable dynamics

One remarkable dynamic is how technological partners are included in consortia. In several cases the technological partner stays as an external vendor and has no or little decisional power. In other cases, they are included more closely in the structure of the consortium and can take decisions and receive financial rewards if the platform succeeds. The motivation to include them so closely seems to be that the business organizations want to include the most technologically experienced and knowledgeable people in the design process of the solution. This desire is understandable but there are some dangers in this collaboration structure resulting from differing interests on the financial side. The business organizations are interested in financial gains and cost reductions resulting from the blockchain solution and carry all the risks of development until the solution creates return on investments. If the technological partner is compensated for their development, they have immediate returns on their invested work and carry fewer risks. The technological partner often intends to maintain and run the solution once it is live and therefore has some incentives in creating a succeeding solution but sometimes hopes to get a cut from the transaction fees. If the technological provider is included in the consortium as an equal member for taking decisions and has the potential to gain money from the success of the platform it is important to balance out the investments done by all parties involved, meaning business organizations and technological partners. Tensions can arise from developing partners having similar earnings from the successful solution, even though they carried fewer risks during the development phase.

In many consortia studied there were competitors collaborating. As long as antitrust laws are respected these collaborations are perfectly legal. Since the blockchain projects often aim at revolutionizing an entire market system it can make sense for competitors to collaborate to design the new standard procedure together. However sometimes competitors have conflicting interests (e.g. two organizations want to patent the same findings) which can be very damaging for the collaboration. If a participant intends to keep ownership over their contribution to the solution, competitors should only be allowed as users of the platform and not part of

the development group. If all participants agree that any results of the collaboration belong to the consortium, then it is fine to include competitors. Still the challenges of coordination fatigue and management complexity must be observed, it can be difficult to add too many partners. Several interviewees emphasized on the fact that collaborators must be chosen carefully.

A further observation is that the consortia under study often try to solve big issues with many actors who might be affected by the change. To create the optimal solution all affected actors should provide their insights and be included in the design. However, by including all organizations issues like coordination fatigue and management complexity become bigger threats. Consortia must find a balance, where as many relevant organizations as possible are included, without making management overly complicated.

a) 'Known from literature': This topic is known and presented in the literature background.
b) 'Found in literature': This topic was not documented in the initial literature used for the literature background, but the topic is reported in literature.
c) 'Insufficient documentation': This topic is insufficiently documented in literature.

Table 95: Classification of dynamics observed according to representation in literature. Own representation.

Known from literature	Found in literature	Insufficient documentation
	Choose partners strategically, especially if competitors are involved	
	Manage growth in number of partners in IO network	
	Including service providers in the consortium	

Influence of blockchain

As summarized in chapter 4.20.3 numerous interviewees do not believe that blockchain influences collaboration. They reason that collaboration is determined by the people involved and not by the underlying technology. Nonetheless there are many interviewees who attribute certain dynamics to blockchain. The fact that blockchain is a great tool for inter organizational collaboration means that collaborators who want to work with blockchain must bring an openness and willingness to collaboration along. Furthermore, the hype surrounding blockchain excites the collaborators to push the project forward. Blockchain seems to require a certain willingness to collaborate inter organizationally in the first place, which can improve the collaboration.

Due to blockchain being a young technology the public does not understand yet the characteristics and possibilities of the technology. Additionally, blockchain has a mixed reputation due to misinformation and the hype. Consortia for one feel obligated to educate the public and in some cases, they even feel like it is necessary for them to go the extra mile to prove that their project is not malicious, perfectly safe, and overall

positive. Consortia also struggle with the lacking matureness of the technology. The frameworks are unstable, and no one knows which framework will become the standard.

Other difficulties are that the consortia lack reference projects to compare works, ideas, and best practices. All these projects need to learn to think within the new realms of possible use cases blockchain enables. Organizations do not know what the value of their new business models are and need to find the right pricing and monetization models. One observation which needs further analysis is whether it is only cases which are a 'solution looking for a problem' running into difficulties finding the right monetization strategy or whether that is a general difficulty with the new blockchain base business models.

a) 'Known from literature': This topic is known and presented in the literature background.
b) 'Found in literature': This topic was not documented in the initial literature used for the literature background, but the topic is reported in literature.
c) 'Insufficient documentation': This topic is insufficiently documented in literature.

Table 96: Classification of blockchain related dynamics according to representation in literature. Own representation.

Known from literature	Found in literature	Insufficient documentation
	Blockchain and corporate culture	Guidance on blockchain business models
	Bad reputation of system requires extra signaling effort.	

6. Conclusion

6.1. Summary

Regarding the **type of organizations** which participate in inter organizational collaborations there have been no new findings in the cases observed. It is possible that some new forms of relations within consortia have been observed, where for example an entire industry, both competitors and buyer-sellers come together in case 04. Service providers have at times been tide very closely with the consortium, even though they did not have any intentions to be a user of the solution, as other collaborators would have been. For the **interests and motives**, they are either typical within IO networks or common in innovation projects or the IT industry. Most prevalent are financial motives including being a leader on the market by developing cutting edge technology. No new discoveries have been made along those fronts.

The **inner dynamics** have highlighted that some of the dynamics reported by literature are very true within blockchain consortia, while other dynamics are untypical to find within the cases observed. The need to establish a common vision is very pronounced, while challenges like culture clashes or power imbalances do, for most cases, not pose any problems. Some interviewees have attributed these missing challenges to the blockchain technology itself, which requires a willingness to collaborate and openness towards the partners as a prerequisite. Some interviewees are of the opinion that blockchain does not influence the way collaboration is done, because that depends solely on the people involved, not the technology. Looking at the list of dynamics attributed to blockchain the truth likely lies in the middle. Because blockchain does not bring new inner dynamics but has a set of dynamics which are far more relevant and present than in non-blockchain collaborations.

6.2. Threats to Validity

When looking at threats to validity there is for one the data set and for the other the subjectivity of the analysis. From the 19 cases only one had interviews done after the consortium failed. Considering the goal of understanding what leads to failure or success of a blockchain consortium more data of failures would have been desirable. Especially considering that in the interviews of the failing case there are far more insights on crucial dynamics compared to other interviews. Furthermore, many of the projects are still under way at the time of the interview, which means that it is too early to judge whether a case will end in success or not. A second limitation in the data is that large consortia were portrayed by few interviewees. These insights provided can be biased and not tell the whole story of the consortium is understood. However, with this many different cases analyzed many views have been shared, which counteracts that limitation. Lastly, the analysis of the interviews is not purely objective, and a certain subjective interpretation is necessary. Certain observations might have not been made due to this.

6.3. Future Work

Within this thesis it has become clear that the culture of a consortium plays a large part whether a collaboration goes well or not. In that sense it might be interesting to gain a better understanding of the optimal corporate culture for a blockchain collaboration to succeed. This thesis has uncovered some cultural components, but they are more of a biproduct and not the focus. Case 04 has an interesting setup where both competitors and buyer-sellers joined to form a consortium. From literature it is not clear whether this mix of roles is unique to blockchain or exists in other areas too.

Several organizations are still looking for a business plan with the new possibilities blockchain has to offer. Businesses are lost when it comes to monetizing the solution and determining their value. More expertise is needed on that front and an unanswered question is whether the lack of business plan results from too many organizations have started a project motivated by gaining experience with blockchain instead of solving a use case.

Figures and Tables

Figures

Tables

Sources

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Appendix 1: Interview Guide

Interview guide: Challenges and Success Factors for Blockchain Consortia

0. INTRODUCTION

0.1 I will start with giving you some background information on and instructions for the interview.

- As you know, the interview is part of a joint study of the IMRG at UZH and Deloitte. During the interview, I would like to find out more about the blockchain consortium []. We will talk about how your consortium was initiated, the consortium's business model, your blockchain-based platform, collaboration and governance in the consortium, as well as legal issues. - Besides this interview, we're planning / have done interviews with persons X and Y. - With your permission, we would like to record the interview. Of course we can interrupt the recording, if you would like or tell us if you want something to be off the record. - Based on the recording, we will produce a transcript of the interview. If you like, we will gladly send you a copy of the transcript for review. - All information will be used anonymously in the publication.	

0.2 Could you please tell me a bit about your personal background and your current role in your organisation?

- Please describe your current position at your company. - How long have you worked in this position? - Which previous jobs did you have before taking up your current job?	

1. SETTING THE SCENE: Let's talk about your consortium [].

1.1 Could you please give me a brief overview of how this / your consortium was formed?
   Which other options besides forming a consortium did you consider?
   Why did you rule out those other options and decide to cooperate in a consortium?

☐ Overall goal / Starting point (business idea vs. using blockchain for…) ☐ Formation process (when, who, how, why, where) ☐ Funding	

1.2 What is the legal form of your consortium?
   Under which jurisdiction was your consortium formed?
   Why did you choose that legal form and jurisdiction?

☐ Association / club (Verein) ☐ Foundation (Stiftung) ☐ Partnership by contract (einfache Gesellschaft) ☐ Branch (Zweigniederlassung) ☐ Private Limited Company, Public Limited Company / Corporation (GmbH, AG) ☐ Subsidiary company (Tochtergesellschaft) ☐ Non-governmental organization (Nichtregierungsorganisation) ☐ Other?	
☐ Switzerland ☐ UK ☐ US ☐ Other?	

1.3 Why would the consortium deploy blockchain? When did you decide to use blockchain?

☐ Expectation of consortium related to blockchain technology ☐ What was first: business idea or blockchain ☐ Previous experiences from consortia / working groups ☐ Perceived differences of using blockchain technology compared previous experiences ☐ Blockchain technology as an enabler / constraint in general	

1.4 *If interviewee is founding member*: How were the members of the consortium selected? What is each partner's role and which role does your company have / expect to have in this consortium?
   ***If interviewee joined later*: When and why did you join the consortium? What is each partner's role and which role does your company have / expect to have in this consortium?**

☐ Selection of partners ☐ Consortium members' motivations / objectives / expected benefits in consortium ☐ Leaders of the consortium and their duties	

2. HOW DOES THE CONSORTIUM OPERATE?

2.1 BUSINESS MODEL:

I would now like to focus on the consortium's business model.

2.1.1 **How would you describe** the initial business idea of the consortium? Is this idea still the current focus of the consortium?

➔ If not: **How** has it changed over time and **why** has it changed? **How** did you maintain consensus?

☐ Business motivations / ideas for being member of the consortium ☐ Change of business idea over time ☐ Decision-making concerning business direction	

2.1.2 **What** is the consortium's envisioned business model? **Why** would the consortium decide for that specific business model?

☐ Business model ☐ Revenue streams	

2.1.3 **Please characterise** the customers / business segments targeted by the consortium. **Why** would specifically those customers / business segments be interested in your solution?

☐ Potential concerning value creation strategies
    o   novel products or services
    o   more customized services
    o   more efficient or leaner services
☐ Target group
☐ What makes system unique / better than existing solutions	

2.1.4 **Which problem** does your system solve in a superior way? **How** is blockchain technology helping you to create superior value and achieve your business goals? (**Why**?) On the other hand, **how** does the use of blockchain create challenges in terms of value generation? (**Why**?)

☐ Benefits / unique value and costs of using blockchain technology ☐ Aspects of blockchain technology contributing to business goals	

2.1.5 **How** does the fact that you are organised as a consortium facilitate creating superior value and achieving your business goals? (**Why**?) On the other hand, **how** does this organisational form create challenges in terms of value generation? (**Why**?)

☐ Benefits of being organised as consortium ☐ Issues due to being organised as consortium	

2.1.6 We have now talked about the business model of the consortium as a whole. Besides that, **what** was the business case of your company to join the consortium? And **how** / where is the consortium helping you to improve your performance?

☐ Benefits / unique value and costs of using blockchain technology ☐ Aspects of blockchain technology contributing to business goals	

2.1.7 Finally, we would like to know whether your consortium has an own token / is planning to implement a token-system?

➔ If yes: **Please describe** the token's function.
Have you considered alternative types of token? **Why** did you decide for the selected token rather than the considered alternatives?

➔ If no: **Why** have tokens been left out of the product design?

☐ Role of the token
☐ Characterisation of token (if applicable)
  o Purpose
  o ICO / token sale
  o How and when were/are tokens created? (fixed one-time supply vs schedule-based vs ...)
  o How can tokens be acquired? (bought / earned through work / ...)
  o How do you classify the token according to the following (yes/no): spendable? tradable? expirable? destroyable?
  o How is the supply of tokens managed over time, and who is responsible for it?
  o Are there any planned changes on token design for the near future?
  o Which rights does the holder of a token have?
  o Can / how can tokens be transferred? Can individuals (re)gain access to their tokens if they lose their private key?
  o What happens with the tokens in case the consortium is closed?
☐ Legal aspects concerning token	

2.2 PLATFORM AND HANDLING OF DATA:

Let's talk about the solution / system that your consortium has implemented / is planning to implement.

2.2.1 **Who** implemented the initial system and how was it implemented? Have you considered alternative platforms / types of blockchain? **Why** did you decide for this platform / type of blockchain?

☐ Requirements ☐ Platform and type of blockchain ☐ Role of blockchain technology in implementation ☐ Blockchain technology as an **enabler** / constraint regarding technical aspects	

2.2.2 **How** do you deal with new technical requirements to the system? Can you / **how** can you change the system's architecture?

☐ Changeability of the system's architecture ☐ Decision-making concerning system's architecture	

2.2.3 **Which** (personal) data does the consortium use within the project and **how** are these data used?

☐ "lifecycle" of data in the project (collection, use, storage, ownership, deletion) ☐ Collection of user-related (e.g. customer-related) data without user's knowledge / their consent ☐ Where is (which) data stored (data pool, on chain <-> off chain)	

2.2.4 **Who** is allowed to enter data into the system and why? **How** do you make sure that entries are correct?

☐ Who is allowed to enter data (and why) ☐ How is correctness / quality of data ensured ☐ Changeability of data	

2.2.5 Regarding the example data entry that you just mentioned: **Who** has access to the data employed by the consortium and why? **How** do you protect (personal) data?

☐ Access to data ☐ Ownership of data ☐ Traceability of data access	

2.2.6 Besides what you have already told me, **are there any** global privacy policies for the treatment of data that all consortium members have to follow? **How** does blockchain technology enable privacy?

☐ Privacy policies of the consortium vs. privacy policies of individual companies ☐ Blockchain as an enabler of privacy	

2.2.7 **Which** challenges regarding your platform and data handling arise due to your blockchain implementation? **How** do you address these challenges?

☐ Challenges regarding platform design / operation ☐ Challenges regarding data handling	

2.2.8 Imagine there was a hack or fraud – **how** would the consortium deal with that?

☐ Reversibility of transactions / decision-making regarding transactions	

2.3 COLLABORATION AND GOVERNANCE:

In this part of our interview, I would like to learn more about how members of the consortium make decisions and work together.

2.3.1 Please think of a recent stage in your project and recall a major decision made in this stage. **Please tell me** about this decision and **how** you came to (o did not come) to an agreement in the consortium.

☐ Who makes decisions and how ☐ Differences between decision-making in different areas ☐ Changeability of decisions ☐ Use / role of blockchain in decision-making	

2.3.2 Regarding the stage you were referring you, please **describe** the responsibilities and tasks that different members of the consortium had in this stage. **How** did you allocate different responsibilities and tasks? (**Why**?)

☐ Structure of project work ☐ Competences and tasks of different partners ☐ Subteams and roles	

2.3.3 In the stage you were talking about, **how** did the different consortium members communicate with each other, e.g. to inform each other about the current status of their work or to discuss a new requirement?

☐ Frequency of communication ☐ Communication targets ☐ Modes of communication ☐ Communication tools ☐ Main topics	

2.3.4 It seems that each partner has some tasks that they do individually. There are also many tasks that are done together by all members or a team of several members. **How** do you organise collaborative work in the consortium?

☐ Collaboration tools ☐ Positive / **negative** example for project work	

2.3.5 Compared to other consortia / working groups that you might be involved in or your company, *do you feel* that the use of blockchain technology in the consortium influences how members work together and make decisions? *How* does your blockchain implementation influence the way you work together?

How does blockchain technology enable / constrain your work?

☐ Role of blockchain in collaborative processes / internal governance ☐ Blockchain as an enabler / constraint in these processes	

2.3.6 *How* does the fact that you are organised as a consortium influence how members work together and make decisions? *How does this structure enable / constrain your work?*

☐ Role of consortium as form of cooperation in collaborative processes / internal governance ☐ Consortium as form of cooperation as an enabler / constraint in these processes	

2.4 LEGAL AND REGULATORY:

Finally, we now would like to shed light on some legal and compliance aspects.

2.4.1 Beyond the consortium with its (internal) members, *could you tell* me more about how external influences /stakeholders impact the work of the consortium? *Why* would these external aspects have an influence? *How* do external influences enable or constrain your work?

☐ Regulatory environment ☐ Which external aspects influence work of the consortium / decision-making ☐ How do external aspects influence work of the consortium / decision-making ☐ To what extent do external aspects work as an enabler / constraint of consortium work ☐ Role of external aspects in different stages of development of the consortium ☐ Who deals with external aspects	

2.4.2 ONLY IF THERE ARE COMPETITORS IN THE CONSORTIUM: Some of the consortium members operate in the same industry / target similar customer segments. Besides how you manage that situation internally in the consortium (governance?), I was wondering how your consortium legally deals with the situation that the individual members are competitors?

(How does the regulator see your consortium (i.e. related to antitrust issues)?)

☐ General challenges related to consortium members being competitors ☐ Antitrust issues (Kartellrecht-Problematik) ☐ Discussion with regulator? Regulatory waiver in place?	

2.4.3 (What do you consider as assets of the consortium? / What assets does the consortium have?) Who owns the consortium's assets and how are liabilities shared?

In other words: In case, your consortium dissolves, how will assets and liabilities be divided?

☐ Who owns intellectual property ☐ Who owns blockchain solution ☐ Who owns data ☐ How are liabilities shared? ☐ Permissioned <-> permissionless blockchains	

2.4.4 What were biggest legal, regulatory and compliance challenges experienced by the consortium? How did you address them?

☐ Unsolved legal aspects? ☐ Challenges related to legal form / legal structure ☐ If you would start again, would you choose the same legal form again?	

3. CLOSING: We're now close to the end of the interview.

3.1 What was your most remarkable moment as a member of this consortium so far (and **why**)?

3.2 What do you personally consider as the consortium's biggest achievement / success so far? **How** did you celebrate this achievement?

☐ Analysis of "common ground" / shared identity ☐ Analysis of informal events and relationships ☐ Trust	

3.3 In your opinion, what are the biggest challenges currently faced by the consortium?

3.4 Looking at the overall story of your consortium: With your current knowledge, what would you do differently if you could turn back time? What would you in the same way?

3.5 (As a final question, I would like to know which aspects do you perceive crucial for the success of blockchain consortia? Which specific challenges / threats can you recognize for blockchain consortia?)

3.6 Are there any documents (e.g. a description of the consortium, information about the blockchain project, a whitepaper) that you could provide as further background information about the consortium? Would you be willing to answer an e-mail with follow-up questions to clarify any aspects that are not clear to us later on?

3.7 Is there anything else that you would like to add? Do you have any questions or comments about the interview?

3.8 I would thank you very much for your interest in our study and participating in the interview.

- How relevant do you find the discussed theme? - Can you recommend other members of the consortium who could provide input for this study? Can you recommend other blockchain consortia who might be interested in taking part in our study?	

Appendix 2: Expected Data from the Interviews

Individual info:

- Name
- Description
    - ○ Business or purpose   (Domain)
    - ○ Skills   (Domain)
    - ○ Changes over time regarding the individual's purpose or skills?
- Role in Consortium
    - ○ Where in value chain?
    - ○ Responsibilities?
    - ○ When did he join?
        - ▪ Founding member?
        - ▪ How did he join?
- Motivation
    - ○ What is the individual trying to achieve?
        - ▪ **What are the interests of the individual?** *(RQ1)*
        - ▪ **What are the expectations of the individual?** *(RQ1)*
    - ○ Why did he join? / Why is the individual trying to achieve this?
        - ▪ **Motivation of interests and expectations** *(RQ2)*
    - ○ Did the motivation to be involved change over time?
        - ▪ How so?
        - ▪ Did it get stronger or weaker?
    - ○ Are the interests aligned or conform with the overall consortium goals?
        - ▪ Aligned / complementary / neutral / opposed
            - How do the interests defer?
            - **What do they do about it? (RQ3)**
                - ○ Dimensions:
                    - ▪ Are they trying to change things in the consortium?
                    - ▪ How are they trying to change things?
                        - Relation to others? Alliances?
                        - Negotiations?
                        - Other?
            - Scenarios (Ideas of possibilities):
                - ○ Did the individual shape the interests of the consortium?
                - ○ Did the individual fit in with the consortium's interests?
- Relations to others
    - ○ Take note of all interactions with other participants.
        - ▪ Describe their relation (supportive, opposed, …), what interactions result from the relation and how the consortium is affected.
        - ▪ Will be used for further analysis in a later step.
    - ○ Are there other members of the consortium who are very comparable to this individual?
        - ▪ What is their relationship? Alliance? Competitors?
- Power of individual
    - ○ Importance of role for Ecosystem?
        - ▪ Own perception
            - Ranking
            - Explanation
        - ▪ Perceived by others

- Ranking
- Explanation
  o Origin of power?
    ▪ Alliances?
    ▪ Role in Consortium?
    ▪ Individual skill?
      • Replaceable participant?
  o Implications on Consortium
    ▪ **Is the power used? (RQ3)**
    ▪ **What are the consequences? (RQ3)**
      • Are they trying to change things in the consortium?
      • How are they trying to change things?
        o Relation to others? Alliances?
        o Negotiations?
        o Other?

Effects of blockchain?

Role info:

- Role Name
- Consists of (Organizations who are in this role)
- Description of Role
  o Role in organization (What do they contribute to the organization?)
  o Where in the value chain do they have their niche?
  o When did the role first appear / join the consortium?
    ▪ Founding member?
    ▪ How did they join?
  o How is the dynamic within the role?
    ▪ Are the role members aligned?
    ▪ Do they see themselves as a subgroup? (Just because I put them in the same role doesn't mean that they cooperate)
- Motivation
  o What is the collective goal of the individuals in that role?
    ▪ **Interests & expectations (RQ1)**
    ▪ **Why do they have this goal? (RQ2)**
  o Did the motivation to be involved change over time?
    ▪ How so?
    ▪ Did it get stronger or weaker?
  o Are the interests aligned with the overall consortium goals?
    ▪ Aligned / complementary / neutral / opposed
      • How do the interests defer?
      • **What do they do about it? (RQ3)**
        o Dimensions:
          ▪ Are they trying to change things in the consortium?
          ▪ How are they trying to change things?
            • Relation to others? Alliances?

- Negotiations?
- Other?
- Power of the role
  - Importance of the role for the Ecosystem?
    - Own perception
      - Ranking
      - Explanation
    - Perceived by others
      - Ranking
      - Explanation
        - Is the role perceived as a group by others?
  - Origin of power?
    - Alliances?
    - Role in consortium?
    - Necessity for consortium success?
      - Replaceable participant?
  - Implications on Consortium (Can be answered in "Role Info")
    - **Is the power used? (RQ3)**
    - **What are the consequences? (RQ3)**
      - Are they trying to change things in the consortium?
      - How are they trying to change things?
        - Relation to others? Alliances?
        - Negotiations?
        - Other?

Consortium info:

What are the interests of the consortium?

- Consortium name
- Consortium description
  - What are they trying to solve? **(RQ1 (Expectations))**
  - Why are they trying to solve this? **(RQ2 (Motivation))**
  - Who are the members?
  - Who are the founding members?
- What are the agreed upon interests of the consortium? **(RQ1)**
- What does the consortium expect from their efforts? **(RQ1)**

- Events which went well for the consortium.
  - What was the origin of this positive event?
- Events which slowed progress down for the consortium.
  - Who slowed it down?
  - Who helped overcome it?
  - How was it overcome?

Appendix 3: Initial Codebook Version

Code	Sub-code	Brief definition	Full definition
stakeholder		Information about stakeholders	A stakeholder can be of the class: individual, organization, active role, given role
stakeholder	stakeholder_identity	Identity and role of the stakeholder.	General information about the stakeholder. For individuals: Education, career path, job, parent company, qualifications. For organizations: Name, purpose. For all: Location, responsibilities and role in consortium, how they joined the consortium, any changes over time in these aspects. Should answer following questions: Where in the value chain are they? What responsibilities do they have? Who are they? Are they a founding member? At what occasion did they join?
stakeholder	stakeholder_interests	Stakeholder's interests, expectations and motivation.	Information about the stakeholder's interests, expectations and motivation for their interests and expectations with the consortium. Should answer following questions: What are the stakeholder's interests with the consortium? What is the stakeholder personally trying to achieve? What are the stakeholder's expectations with the consortium? What do they hope to achieve with the consortium? What motivates the interests and expectations of the stakeholder? Why did the stakeholder join? What makes the stakeholder want to achieve their goals? Did the motivation change over time?
stakeholder	stakeholder_interests_actions	Actions taken motivated by identified interests.	Information about the stakeholder's actions to achieve his interests. How does he go about following his interests? What is he trying to do?
stakeholder	stakeholder_importance	Importance of stakeholder, self perceived and by others.	Information about the stakeholder's self perception of their importance to the consortium. Information about the stakeholder's importance perceived by other stakeholders.
stakeholder	stakeholder_power	Individual's power origin and usage.	Information about the origin of power for the stakeholder. Alliances? Relevance of stakeholder? Information about the usage of power by the stakeholder and its consequences. Should answer following questions: Does he use his power? How does he use it? What are the consequences for the consortium?
consortium			
consortium	consortium_identity	Identification of consortium.	Information about the consortium's name, location, founding, description. Should answer following questions: Who is this consortium?
consortium	consortium_interests	Interests and goal of consortium	Information about the consortium's interests, expectations on their achievements, their motivation. The purpose of the consortium. Should answer following questions: What are the interests of the consortium? What are the combined interests of the consortium? What are the expectations of the consortium? What do they hope to achieve with the consortium? What are the combined expectations of the consortium? What motivates the interests and expectations of the consortium? What is the combined motivation of the different members of the consortium?
relation			Information about relations between stakeholders. These relations don't have a direct impact on the consortiums work.
relation	relation_identity	Stakeholders and their relation.	Information about the stakeholders involved in the relation and description of the relation they have. Information about the reason for the relation to exist. Should answer following questions: Who is involved in this relation? What is the relation like between the involved stakeholders? Why does the relation exist? What is the motivation of the parties?
dynamic			Information about relations between stakeholders. These relations have a direct impact on the consortiums work and we call them dynamics.
dynamic	dynamic_identity	Stakeholders and their relation.	Information about the stakeholders involved in the dynamic and the relation they have. Information about the reason for the dynamic to exist. Should answer following questions: Who is involved with the dynamic? What is the relation like between the involved stakeholders? Why does the dynamic exist? What is the motivation of the parties?
dynamic	dynamic_effect_consortium	Consequences of dynamic	Information about the dynamic's consequences on the consortium. Should answer following questions: What is the effect on the consortium? What are the consequences of the dynamic?
dynamic	dynamic_managed	How the dynamic is dealt with.	Information about how the consortium reacts upon the existance of the dynamic. What is done about it. Should answer following questions: Is the dynamic recognized by third parties? What do they do about it? In case of conflict: How is it resolved? Who resolves it? If dynamic productive: How does the consortium let it thrive?
blockchain		aspects relating to deciding for and using blockchain technology	A blockchain is distributed and immutable record or ledger of digital events that is shared by independent parties, and updated only by a consensus of a majority of the participants in the system. The key features of blockchain technology are decentralisation, trust and provenance, and resilience and irreversability.
blockchain	blockchain_why	reasons for using blockchain technology	Motivations / objectives / expected benefits from using blockchain technology, decision regarding use of blockchain technology, and considered alternatives; e.g. * blockchain is perceived as innovative technology, use case followed technology choice (blockchain_first) * consortium started with business problem and expected that blockchain would meet their needs (business_case_first)
blockchain	blockchain_on-chain	what the blockchain does	The code refers to functions that are encoded directly into the underlying infrastructure of a blockchain-based system, e.g. * the data that is stored on the blockchain * the processes that are run on the blockchain (in a more efficient way than before) * smart contracts
blockchain	blockchain_implications	role and implications of using blockchain	How blockchain technology influences (changes / positively or negatively influences) various aspects of the consortium (business model, governance, collaboration, technology); e.g. * how specificities of blockchain technology (e.g. trust, transparency, decentralization, sharing, encryption etc.) influence value creation, capturing, and transfer from the technology to the customers * how the use of blockchain influences governance, e.g. disintermediation of parties * how the use of blockchain influences how members work together