UNIVERSITÉ DU QUÉBEC À MONTRÉAL

BLOCKCHAIN IN JOURNALISM - POTENTIAL FOR DISRUPTION?

AN EXPLORATIVE CASE STUDY OF THE NEW YORK START-UP CIVIL

ENRICHED BY THE INDUSTRY KNOWLEDGE

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While it was an easy decision to write this master thesis in English, choosing only one language for the acknowledgements didn't feel like an appropriate way to do justice to a life that takes place predominantly in French and German. Hence, I decided to address all persons in the language by which I usually communicate with them; after all, these acknowledgements are meant for them!

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DEDICATION

Für Papa,
für deine Inspiration und dein Credo:
Lass dich nie von deinem Weg abbringen.

PREFACE

The motivation for this master thesis was to explore a new avenue to address the current challenges of the modern media landscape.

It is the result of my personal passion for journalism, observations of the developments in the digital era as well as technological knowledge that I have acquired over the last years. Watching the metamorphosis of the media, news creation and news dissemination with great concern, and torn between the promises and challenges of technology, my ambition for this master thesis was to contribute to the pursuit of the future of journalism and the place of emerging technologies like blockchain in our society.

I am convinced that the changes in the journalism industry as well as the penetration of technology in our lives are realities that we should face up to in order to pave the way for new leitmotifs. Therefore, even though the future of blockchain in journalism is uncertain, I hope providing a piece of research that can inspire and encourage future researchers to combine an emerging technology with the old craft of journalism that perhaps has never been as topical as today.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AP	Associated Press
API	Application Programming Interface
CEM	Centre d'études sur les médias (Media research center)
CMS	Content Management System
CPR	Common-pool resource
CRM	Customer Relationship Management
CRT	Cathode-ray tube
CVL	Cryptocurrency of Civil
DAO	Decentralized Autonomous Organization
DApp	Decentralized Application
DLT	Distributed Ledger Technology
DO	Decentralized Organization
ETH	Ether (Currency)

GAFAM   Google, Amazon, Facebook, Apple, Microsoft

GCM   Groupes Capitales Médias

GDPR   General Data Protection Regulation

ICO   Initial Coin Offering

IP   Intellectual Property

IPFS   InterPlanetary File System

KYC   Know-Your-Customer

M&A   Merger and Acquisition

OCR   Optical Character Recognition

OECD   Organisation for Economic Co-operation and Development

PoS   Proof-of-Stake

PoW   Proof-of-Work

R&D   Research and Development

SEC   Securities and Exchange Commission

TCR   Token-curated registry

VDT   Video Display Terminal

ABSTRACT

This thesis explores the disruptive potential of blockchain technologies in the journalism industry based on the case of Civil, an American start-up which developed a news platform backed by a blockchain network. Blockchain networks are distributed ledgers that, in combination with a set of different technologies, allow for peer-to-peer, tamper-proof and indelible transactions in various business fields. For the modern journalism landscape which is characterized by numerous challenges caused by the digital era blockchain technologies offer several promises: permanent archiving; an optimized data protection to support the rights of content creators; identity management; novel funding models by means of micropayments; automation of business processes; disintermediation and the re-establishment of trust. The research was conducted as an explorative case study which consisted of two phases. First, a case analysis about Civil was carried out, using publicly available documentation. Second, promises and challenges of blockchain models as proposed by Civil were evaluated. For this phase, a total of eleven interviews with three interview groups were conducted: with the Civil team, journalists using the Civil platform as well as journalism experts in Quebec, Canada, unaffiliated with Civil. Based on the work of Flichy (1995) and Christensen (1997), the data were analyzed regarding the use and functioning of blockchain-based tools and models as well as their potential for disruption on an industry level. The findings suggest that Civil provides new tools and governance models for journalism which offer the potential to trigger a *Disruption of the Stolen Model*, referring to the appropriation of the traditional news business model by social media. However, this disruption and large-scale adoption will depend on a range of social, technical and economic incentives, notably: consumer education, improvement of the user experience and strategies for business model adaptation. A multi-dimensional paradigm shift comprising the alignment of social mindsets and technological infrastructures could furthermore mitigate a current user socio-technical dilemma with regard to blockchain technologies.

Keywords: Blockchain, journalism, crisis, disruption, emerging technologies, business model, self-governance, tokenomics

RÉSUMÉ

Ce mémoire explore le potentiel disruptif des technologies blockchain dans l'industrie du journalisme en s'appuyant sur le cas de Civil, une start-up américaine qui a développé une plateforme journalistique soutenue par un réseau blockchain. Les réseaux blockchain sont des registres distribués qui, en combinaison avec un ensemble de technologies différentes, permettent des transactions pair-à-pair, immuables et indélébiles dans divers domaines d'affaires. Pour le paysage médiatique moderne – caractérisé par de nombreux défis causés par l'ère numérique – les technologies blockchain offrent plusieurs promesses : l'archivage permanent, une protection des données optimisée pour soutenir les droits des créateurs de contenu, la gestion de l'identité, de nouveaux modèles de financement grâce aux micropaiements, l'automatisation des processus d'affaires, la désintermédiation et le rétablissement de la confiance. La recherche a été menée sous la forme d'une étude de cas exploratoire qui s'est déroulée en deux phases. Tout d'abord, une analyse de cas sur Civil a été réalisée, en utilisant des documents accessibles au public. Ensuite, les promesses et les défis des modèles blockchain tels que proposés par Civil ont été évalués. Pour cette phase, un total de onze entrevues avec trois groupes différents ont été réalisés : avec l'équipe de Civil, des journalistes utilisant la plateforme de Civil ainsi que des experts en journalisme au Québec, Canada, non affiliés à Civil. Basé sur les travaux de Flichy (1995) et de Christensen (1997), les données ont été analysées par rapport à l'usage et au fonctionnement des outils et des modèles blockchain ainsi qu'à leur potentiel disruptif au niveau de l'industrie. Les résultats indiquent que Civil fournit au journalisme de nouveaux outils et modèles de gouvernance qui offrent le potentiel de déclencher une *rupture du modèle volé*, faisant référence à l'appropriation du modèle d'affaires traditionnel des médias par les médias sociaux. Toutefois, cette rupture et une adoption à grande échelle dépendront d'une série de mesures incitatives sociales, techniques et économiques, notamment : l'éducation des consommateurs, l'amélioration de l'expérience utilisateur et des stratégies d'adaptation du modèle d'affaires. De plus, un changement de paradigme multidimensionnel, y compris l'alignement des mentalités sociales et des infrastructures technologiques, pourra mitiger le dilemme socio-technique d'utilisateur actuel envers les technologies blockchain.

Mots clés : Blockchain, journalisme, crise, rupture, technologies émergentes, modèle d'affaires, auto-gouvernance, tokenomics

INTRODUCTION

The advent of the digital era has unsettled a wide range of industries by giving rise to numerous emerging technologies that have the potential to disrupt existing business structures. One type of the currently intensively discussed technologies are blockchain technologies which mainly focus on the decentralization of business transactions. The major promises of blockchain technologies are disintermediation; traceability; greater integrity and security; the creation of decentralized identities; an optimized proof and transfer of ownership as well as the possibility to establish trust and a common truth. The first prototypes of blockchain solutions are being developed notably for the financial sector. However, the possible application of blockchain networks is not limited to any specific business field; the technologies may also impact the creative economy including the music sector, the art industry, publishing, and journalism. Especially the latter one is an industry that has been seriously hit by a range of economic and social phenomena like concentration in media ownership; convergence; disaggregation; audience fragmentation; the lack of a sustainable funding model; competition from social media; citizen journalism; copyright issues; fake news; a significant loss of trust among readers as well as social polarization. The precarious situation of the industry is also affecting media in Quebec, Canada (Brin & St-Pierre, 2013, p. 7). Using a comparison to the current environmental crisis, Quebec journalist Marc Raboy warns that the news industry has already reached the phase of global warming (Gasher et al., 2016, p. xvii). Accordingly, it is imperative for traditional newspapers to address the digital challenges in order to keep pace with the technological progress.

In this study, we highlight the case of Civil (https://civil.co/), to our knowledge the only business so far experimenting with blockchain technologies in the field of traditional journalism. Civil has been developing a news platform running on a blockchain protocol offering independent newsrooms and journalists the chance to publish free from the influence of centralized media structures, and instead focus on a more direct relationship between individual journalists, audiences and the community (Civil, 2018c). They have also been establishing a self-governance model as well as an ecosystem of different blockchain-based tools and functionalities, i.e., technological applications for journalistic purposes like archiving, licensing or fundraising. This study aims to identify the promises and challenges of a news platform based on blockchain technologies by examining the case of Civil and subsequently to evaluate blockchain's disruptive potential for the journalism industry. We identified the possibilities and challenges of each tool, and examined the platform's implications for media outlets on a business level. For this purpose, we conducted an explorative case study by interviewing the Civil team, journalists from the Civil community as well as journalists in Quebec unaffiliated with Civil.

The contribution of this study is to explore a new blockchain application beyond finance by presenting blockchain as novel approach to address the "crisis" of journalism by linking the technologies' promises to the industry's challenges. Our focus on the *disruptive potential* of blockchain technologies in journalism can contribute to a field of research which is currently of great public interest: the disruption theory developed by Clayton Christensen in 1995 is nowadays receiving more attention in academia and business practice than perhaps ever before. For example, the MIT Sloan Management Review published a special collection in spring 2020 which analyzes the future of disruption in the next decade (Dillon, 2020). It shows that 25 years after the theory's conception, the pace of innovation and the

emergence of new disruptive technologies make the phenomenon of disruption a highly topical issue for business and society.

Our findings can serve journalists and media companies in Quebec and elsewhere as guidelines about how they could make use of blockchain technologies in order to address current challenges. More particularly, they can help editors and executive staff to better assess the platform's implementation in their workflow and allow individual journalists to explore the technologies as a catalyst for new business models. Furthermore, the study allows audiences to discover new ways to get involved in the news creation process. For the blockchain research community in both academia and business, the case study represents a possible starting point for future projects which can be explored and developed further.

This text is structured as follows: In the first section, the research problem, question and objectives are described. In the second part, a literature review about blockchain technologies and the evolution of the journalism industry is presented. The literature review consists of four parts. First, the origins of blockchain are outlined, and the technologies are defined as well as explained from a technical point of view. Thereafter, the most crucial opportunities and promises of blockchain technologies for businesses are mapped. Second, the characteristics of the journalism industry are examined by illustrating its historical evolution as well as its current challenges. Third, possible applications of blockchain technologies in the journalism industry are listed and explained. Subsequently, we illustrate these applications by summarizing the case of Civil. The third chapter of the text outlines the conceptual framework applied in the study. In the fourth section, the methodology is presented. The chapter explains the research method from a general point of view and then describes the processes of data collection as well as data analysis. The fifth chapter summarizes the results from our interviews before we discuss them in the sixth chapter, where we

also present the theoretical and practical contribution of our case study. Finally, the last chapter summarizes the key findings of the study, lists the study's limitations as well as some ideas for future research.

CHAPTER I

RESEARCH PROBLEM, RESEARCH QUESTION AND RESEARCH
OBJECTIVES

1.1   Research problem

At its inception, the Internet was glorified as a panacea for social and economic inequality, able to create an open, democratic, decentralized and egalitarian network integrating citizens all around the globe. Even if some of these expectations became true – for example by democratizing services like e-mail or the World Wide Web – the core idea behind the Internet and its functionalities also backfired to a certain extent, by favoring centralized and unequal structures in society and economy. This centralization is especially apparent on the Web which is today the number one marketplace for almost any type of interaction. By gathering an immense crowd of customers, the Web has become an interesting business area for big companies like Google and Facebook who strive to absorb market share by abusing the Web via control, manipulation and surveillance. By misusing private data for commercial purposes, they now dominate the digital market (Tapscott & Tapscott, 2018, pp. 31-33). In view of this evolution, the research problem we examine is two-fold: first, the journalism industry has been affected by these developments, thus requiring approaches to mitigate problems; second, the buzzword blockchain is associated with a bundle of emerging and audacious technologies that could potentially help to address these challenges, while still being considered a niche solution whose

promises have yet to be evaluated in theory and practice. In the following paragraphs, we shortly explain these two pillars of the research problem and how they can be linked.

Blockchain technologies are being developed as new paradigm for the proponents of a decentralized Web who aim to overcome the oligopolistic structures of the digital market. Hence, blockchain is claimed to be as disruptive and revolutionary as the Internet (O'Dair, 2019, p. 3; Ragnedda & Destefanis, 2020, p. 1). Blockchain networks are Internet-based networks which aim to eliminate the need for powerful intermediaries by creating a distributed network which is controlled and managed solely by its participants, called *peers*. Blockchain is mainly associated with cryptocurrencies, notably Bitcoin and its applications in the financial sector. Several studies provide evidence that research about blockchain focuses predominantly on cryptocurrencies in general and Bitcoin in particular, either on technical aspects or its "impact [...] on traditional economic or commercial structures" (e.g. Hawlitschek, Notheisen, & Teubner, 2018, p. 57). However, blockchain technologies are not limited to one industry but can be applied to a range of business sectors. Although the technologies might disrupt certain industries, practical implementations are only in development and findings from research are still in the embryonic phase.

This is also true for the impacts of blockchain technologies on the journalism industry. Keyword searches in some major databases for management and technology carried out in summer 2019 prove that academia is currently lacking research about blockchain and journalism. A search on Scopus using "blockchain" AND "journalism" showed only one result, an article published in January 2019 in South Korea. The authors present a journalism model based on a blockchain as an alternative to existing structures for news production and dissemination (Kim & Yoon, 2019). In this context, they also present briefly the model of Civil as part of the

state of the art in business practice. SpringerLink refers to the book "Distributed Creativity – How Blockchain Technology will Transform the Creative Economy" published in 2019 by the English author Marcus O'Dair which is also cited later in this text (O'Dair, 2019). However, he does not pay special attention to the case of the journalism industry, but highlights opportunities and risks for the creative economy as a whole. Searches on Science Direct and JSTOR displayed no relevant results at all. Web searches with the two keywords returned some more matches. In another book titled "Blockchain and Web 3.0 – Social, economic, and technological changes" (2020), the editors Massimo Ragnedda and Giuseppe Destefanis examine the potential of blockchain technologies from the lens of disruption theory and with an interdisciplinary approach. One chapter is dedicated to the potential use of blockchain in journalism by analyzing the case of Civil (Al-Saqaf & Edwardsson, 2020). While we focus our analysis on the disruptive potential as defined by Christensen, the authors Al-Saqaf and Edwardsson examine the phenomenon from the lens of Rogers' innovation theory. Apart from that, the think Tank at The London School of Economics and Political Science POLIS published a short report asking "What use is blockchain for journalism?" (Erkkilä, 2019). It draws a summarized picture of the status quo in the industry, including a small portrait of Civil. The Future Today Institute dedicated 24 pages of their "2019 Trend Report For Journalism, Media and Technology" to the major promises of blockchain technologies for the news industry (Future Today Institute, 2019).

The scarce output from key databases confirms that there is a research gap in the field of blockchain and journalism. However, work published recently indicates that the appetite of academia for blockchain research in the field of journalism is growing. We aim to contribute to this promising research field by delivering findings about blockchain in the journalism industry with a special focus on the technologies' disruptive potential. In this text, the term journalism industry is particularly used for

print media in the traditional sense as well as the online press; we do not focus on TV or radio. Although the American communication theorist James Carey warns about the synonymous use of news and journalism given their distinct meaning in history (2007, p. 7), other terms often used are press, newspapers, news industry or simply journalism.

By taking a look at the practical output of the blend of blockchain technologies and journalism in practice, especially one project might be a harbinger that the news industry becomes interested in the technologies. In July 2019, The New York Times announced to experiment with a blockchain network and test ways to identify misinformation more efficiently in order "to make the origins of journalistic content clearer to our audiences" (Koren, 2019). The first mission of the *News Provenance Project* (https://www.newsprovenanceproject.com/) is to develop a proof of concept of the opportunities to evaluate the veracity of content in photojournalism. Initiatives like this are a result of the growing pressure on traditional media to innovate. For a long time, the status of the press as "Fourth Estate" or "watchdog of society" (Macnamara, 2014, p. 280) had remained untouched. However, the rising penetration of the Web in everyday life as well as alternative information sources question these principles and confront the industry with new challenges. Media companies are notably suffering from economic troubles due to the competition created by online platforms providing free access to information as well as the possibility to individually participate in the process of information creation (citizen journalism). Especially for traditional newspapers, the greatest threat today are the two Internet giants Google and Facebook (Freydag & Schmiese, 2018). Given the fact that such companies are prone to pretend that information is a free good (Macnamara, 2014, p. 292), the willingness among readers to pay for printed and online content is decreasing. Despite their efforts to facilitate free access to information, it is a misconception that tech companies produce content themselves. Instead, they refer to

original sources and disseminate information by means of the user community. In order to stay profitable and competitive, newspapers responded to the new demand either by introducing online subscription models or by investing in advertising. However, an increase in online advertising has not compensated for a plunge in print advertising revenue (Macnamara, 2010, p. 22), but instead resulted in an overall financial dependence of media companies on third parties like advertising companies as well as subscriptions by readers. In addition, the credibility and objectivity of the press is more and more called into question on the public scene, diminishing trust among readers in the traditional news industry (Levy & Nielsen, 2010, pp. 35-36). The Quebec press – as many other countries – could not evade the current "crisis". Redundancies, cuts in print editions, shrinking diversity of content and even bankruptcies represent the reality of today's local news industry.

The advent of digital media and its concomitants have polarized the journalistic community. On the one hand, "cyberoptimists" welcome the possibilities for media on the Web because of the numerous newly emerging forms of journalism, representing a chance for the press to reinvent itself. On the other hand, critics adopt a more negative perspective or even endism-related positions (Macnamara, 2014, pp. 255-256). For example, some experts are convinced that the business model of journalism is obsolete and cannot be adapted to the present situation in any manner (OECD, 2010, pp. 99-100). James Curran (2010) classifies the most prevailing attitudes in four major thinking patterns: (1) *continuity*, referred to as denial and ignorance among media companies about the current crisis and the belief that they master the situation; (2) *crisis*, primarily describing closures and dismissals as a reaction to financial troubles of news organizations, resulting in fears about the quality of journalism and the value of democracy; (3) *purgative*, the prevailing attitude among young people who see the fall of the traditional press as its "Armageddon", providing opportunities to impose changes to the industry which

were previously blocked by media conglomerates; (4) *renaissance*, summarizing (over)optimistic views among liberal journalism educators about the possibilities offered by the Web. Proponents of this last category are convinced that the fusion of traditional media and the digital era will introduce a paradigm shift which describes "a situation in which the usual and accepted way of doing or thinking about something changes completely" (Cambridge Dictionary, 2020), allowing for a re-invention of the news business.

In order to cease the "debate between contrasting Doomsday and Micawberish versions" (Curran, 2010, p. 474), it is paramount for the news industry to embark on experiments. One approach to face the challenges of the digital age is to make use of the tools that its rise gave birth to; testing technological solutions which combine the benefits of traditional business models listed above could be an alternative way to tackle the crisis. This text presents blockchain technologies as one possible approach to address major vulnerabilities of the journalism industry. They offer certain promises to the journalism industry: secure and reliable archiving, optimized copyright and data protection, efficient identity and royalty management, alternative funding models, automation of business processes, disintermediation of organizational media structures as well as the possibility to restore trust among readers.

According to our current state of knowledge, there exist only few business cases so far making use of blockchain networks to support, facilitate or enhance journalistic practices. Worth mentioning are Steemit (social media), Po.et (publishing) or Publica (publishing, e-books). In its 2019 Trend Report, the Future Today Institute lists around 40 media companies which either work directly with blockchain technologies (often start-ups) or are investing in blockchain projects (bigger players) (2019, p. 52). However, the list is not exhaustive and not limited to journalism – most of the

businesses are focusing on blockchain-based media solutions for digital advertising (e.g. AdEx, IBM iX), IP and/or royalty management (e.g. Ascribe, Microsoft and EY, Spotify, Ubisoft) or publishing, social networks and media platforms (e.g. CoinDesk, Steemit, Po.et). The last category comes closest to the business case we sought to analyze, but no example seems to provide a tailor-made solution approach that takes into account the news business model as a whole. Since this study aims to examine blockchain promises for journalists and newsrooms in a rather traditional sense (i.e., the technologies' impact on the process of gathering, producing, and distributing news), the New York-based start-up Civil has been chosen for the case study. Civil plays a key role in the identification of blockchain promises for the journalism industry: in order to seize the practical implications of blockchain in a real business context, an analysis about the start-up was carried out in a first step. Thereafter, interviews with journalism experts in Quebec were conducted with the intention to evaluate the disruptive potential of the technologies. Both phases together form a qualitative and explorative case study about blockchain solutions in journalism.

1.2 Research question

The research question is based on the key elements that we presented in the previous section. According to the feasibility study presented in Noël (2011, p. 77), the master thesis focuses on the dimensions *industry* ("length") and *strategic planning* ("height"). The essential dimension of our case study is the "height" which hence should be reflected in the research question. In the present case, strategic planning refers to the disruptive business implications that blockchain technologies could trigger in the journalism industry. Blockchain technologies can be defined as *disruptive* technologies in view of their numerous promises and unique characteristics. Clayton M. Christensen defines disruptive technologies as "new

product and service technologies" which do not correspond to mainstream customer needs in the beginning, but might evolve rapidly and outperform customer demands in later stages (Christensen, 1999, pp. 5, 9). This study examines if blockchain technologies have a *disruptive potential* for the journalism industry. The Oxford dictionary defines *potential* as "latent qualities or abilities that may be developed and lead to future success or usefulness" (Oxford University Press, 2019b). Applied to the context of blockchain technologies, this means that the technologies' qualities are currently only subliminally existent, but future outlooks nourish the prospect that their promises will transform into concrete favorable results in the long term. Hence, *disruptive potential* describes the yet unexploited capability of blockchain technologies to radically change existing business structures.

With these reflections in mind, the research question can be formulated as follows:

Based on the use case of Civil and supported by the assessment of journalism experts in Quebec, how could the use and functioning of blockchain technologies potentially disrupt (parts of) the journalism industry?

This question is divided into two sub-questions:

- How can the journalism industry make use of blockchain-based tools and governance models as developed by Civil in order to address current challenges?
- Which risks and shortcomings have to be taken into account when integrating those tools and governance models in the traditional news business model?

1.3   Research objectives and contribution

As reflected in the research question, the main objective of the research is to map the disruptive potential of blockchain technologies for the journalism industry by exposing the practical case of Civil to the assessment of the Civil team, journalists using the Civil platform and journalism experts in Quebec. The study will provide a comprehensive analysis of opportunities and risks of blockchain applied to the news industry, based on a practical example and the opinion of local experts. More precisely, the research objectives can be summarized as follows:

- Map the promises of blockchain technologies for the journalism industry in a general and theoretical manner;
- Conduct an analysis about Civil including interviews with parties involved in the project in order to validate the identified promises in a practical example;
- Discuss the viability of the Civil model based on the interviews with the Civil team, Civil newsrooms and journalism experts in Quebec;
- Evaluate the disruptive potential of blockchain technologies for the journalism industry in general, including barriers to and measures for adoption, based on the case analysis about Civil and the assessment of the interviewees.

The contribution of this work is to enrich research about blockchain technologies in the application field of journalism where evidence from both business and academics is lacking. With regard to the finding that research is one-sided and mainly covers Bitcoin (Yli-Huumo, Ko, Choi, Park, & Smolander, 2016), we focus on an industry that is often omitted in the discussion about potential blockchain implementations.

More specifically, the scientific contribution is to deliver descriptive research about blockchain technologies. According to Iivari, three levels of research in information systems and thus also in the field of blockchain technologies can be differentiated (Iivari, 2010, as cited in J. L. Zhao, Fan, & Yan, 2016, p. 4). Most research about blockchain so far has been conducted on the *conceptual* level (definition of concepts, constructs and typologies) and the *prescriptive* level (possible implementations), whereas literature on the *descriptive* level (observations, empirical regularities) is scarce. In contrast to the theoretical conceptual approach and the highly practice-oriented prescriptive research method, descriptive studies focus on "how things are out there" (Iivari, 2010, p. 46). This approach aligns with another research gap concerning the evaluation of the "economic and social validity of blockchain applications" (J. L. Zhao et al., 2016, p. 5). Evaluating the disruptive potential of the Civil model by relying on the assessment of journalism experts in Quebec allowed us to appraise several dimensions, especially the scope of technological feasibility and the acceptance among potential users.

Apart from a gap in general research about blockchain applications beyond Bitcoin, Wang et al. (2016, p. 5) add that practical experiments and findings are lacking. Yli-Huumo et al.'s findings confirm that articles from industry are even more scarce (7% of all selected papers) than academic papers. We seek to merge general, theoretical promises of blockchain technologies with the specific, practical use case of Civil because academic research is an interplay of practical experiments in business and the theoretical knowledge built up by multiple disciplines (J. L. Zhao et al., 2016, p. 4). In view of the current challenges in the journalism industry, our contribution with regard to business and practice is to explore the potential of blockchain applications for news organizations by carrying out a case study about Civil.

CHAPTER II

LITERATURE REVIEW

Carrying out a case study about a blockchain project requires a solid understanding of the underlying technologies and the concerned industry. Therefore, a literature review about blockchain as well as the news industry has to be worked out. This chapter summarizes the state of the art concerning blockchain technologies as well as the current challenges of the journalism industry. Thereafter, major promises of blockchain for journalism are presented.

2.1 Blockchain technologies

2.1.1 Central vision

> With blockchain, we can imagine a world in which contracts are embedded in digital code and stored in transparent, shared databases, where they are protected from deletion, tampering, and revision. In this world every agreement, every process, every task, and every payment would have a digital record and signature that could be identified, validated, stored, and shared. Intermediaries like lawyers, brokers, and bankers might no longer be necessary. Individuals, organizations, machines and algorithms would freely transact and interact with one another with little friction. This is the immense potential of blockchain. (Iansiti & Lakhani, 2017, p. 4)

This summary from the Harvard Business Review captures vividly the core vision behind blockchain technologies. The idea is to create a shared network where participants can process transactions peer-to-peer without the need for a third party. Combined with a set of technological methods, it does not allow for deletion of modification of transactions, and fraudulent activities can be detected almost immediately or even be prevented since every participant has to validate all transactions and possesses a copy of them. The ultimate promise of the technologies is to establish a system characterized by disintermediation and trust. The origins of these somewhat idealistic principles date back to the early days of the Internet, and were constantly refined over the last three decades.

2.1.2   Origins

Accordingly, some aspects of the above cited vision did not only emerge together with the idea of blockchain, but have a much longer history. The historical background of blockchain is well described by De Filippi (2018, pp. 7-14). The foundations of blockchain as it is known today were laid in the 1990s by a movement founded by the so-called *cypherpunks*. The group focused on the idea to create a more decentralized society. They pursued the goal to protect private life and the freedom of speech in a digital environment that in the 1990s became more and more controlled by a small number of individuals and large organizations. A key technology to achieve this objective was cryptography. According to the cypherpunks, democratizing the access to cryptography would allow for a secure and confidential communication among Internet users without being observed. A more political splinter group of the cypherpunks with anarcho-capitalistic tendencies were the *crypto-anarchists*. This group primarily strived for independency from any government or governmental institution. Despite their different priorities,

disintermediation of financial transactions was at the core of both ideologies. For this purpose, several attempts were made to establish a decentralized and anonymous payment system, for example Digi-Cash (1989), Hashcash (1997), B-money (1998) or BitGold (1998). BitGold which was created by cypherpunk member Nick Szabo is seen as trailblazer of Bitcoin. The first functional prototype of a digital currency was developed by Hal Finney in 2004, also supporter of the cypherpunk movement. Wei was the inventor of B-Money, the first attempt to link the creation of a digital currency to computational puzzles and decentralized consensus (Buterin, 2014, p. 4).

In addition to these practical applications, research started addressing the topic. One of the first academic contributions in the field represents the paper "How to Time-Stamp a Digital Document" (1991), published by the two researchers Stuart Haber and Scott W. Stornetta. They presented a method which makes documents immutable by means of a timestamp mechanism and based on cryptographically sealed hash functions. In their study, they described how to time-stamp data itself, independently from the medium in use, as well as how to make the document's original dates of creation or its last modification unalterable.

These ideas were taken up by a person or a group of persons under the pseudonym Satoshi Nakamoto who nowadays is known as the Founding Father of Bitcoin, and in a broader sense also of blockchain as it is defined today. In autumn 2008, in the middle of the financial crisis and right after the bankruptcy of Lehman Brothers, the author published an article about a "peer-to-peer electronic cash system" (Nakamoto, 2008). He criticized the dependence on intermediaries in financial transactions and the absence of peer-to-peer alternatives. Therefore, he had developed "an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party" (2008, p. 1). This payment system finally became Bitcoin. More precisely,

Bitcoin can be described as a "peer-to-peer payment system allowing to transfer value on the Internet in a secure and completely decentralized manner"[1] (De Filippi, 2018, p. 16, translated from French). Nakamoto did not explicitly mention the terms *blockchain* and *bitcoin*, but already used the terms *chain* and *coin*: "we define an electronic coin as a chain of digital signatures" (2008, p. 2). He compared the constant creation of new coins to gold miners adding gold to the amount circulating, which explains the term *miners* for computers producing new bitcoins.

In January 2009, Satoshi Nakamoto mined the first 50 bitcoins which built the first block, the so-called *genesis block*, and published the code for the Bitcoin software as open source (Wallace, 2011). He embedded the title of an article about the financial crisis published by The Times on January 3, 2009: "Chancellor on Brink of Second Bailout for Banks". This detail is often interpreted as indication that the financial crisis served as main motivation for Nakamoto to initiate the Bitcoin network (De Filippi, 2018, p. 15). Already in 2011, some other cryptocurrencies occurred, as for example Namecoin or Litcoin. The topic started gaining in public attention with the ongoing increase of Bitcoin's value. While one bitcoin was worth $0.06 on 1 August 2010 (Bitcoin Average, 2019), prices slowly increased in the following three years. In November 2013, the price was already at $1,200 (CryptoIndex, 2019). In 2016, Bitcoin's main competitor Ethereum entered the cryptocurrency market (see description in the next section). In the same year, Initial Coin Offerings (ICOs) emerged, i.e., the possibility to invest in and trade with cryptocurrencies. In 2016, the research and advisory company Gartner included blockchain in their Hype Cycle for Emerging Technologies. It was already placed almost on the peak of inflated expectations (Walker, Burton, & Cantara, 2016). In 2017, the blockchain had exceeded the peak and entered the period of "disillusionment" (Walker, 2017)

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[1] "un système de paiement pair à pair permettant le transfert de valeur sur Internet de façon sécurisée et complètement décentralisée".

although bitcoin prices started to skyrocket in the beginning of 2017. In the course of the year, several banks like Barclays, Citi Bank, Deutsche Bank and BNP Paribas announced to test methods how to integrate Bitcoin in their business. On December 17, 2017, Bitcoin's value reached its all-time high of slightly more than $19,300. Since then, prices fluctuated; while in December 2018, the price was at roughly $3,300, it soared to about $9,700 one year later (Bitcoin Average, 2019; CryptoIndex, 2019; Marr, 2017; Wallace, 2011). In March 2019, 2,121 cryptocurrencies with a total market capitalization of $139.8 billion existed (CryptoIndex, 2019).

Despite a general tendency to associate blockchain with Bitcoin, applications for blockchain technologies are not limited to the financial sector. Zhao et al. identified three generations in the evolution of blockchain and its applications: *Blockchain 1.0 for digital currency*, *Blockchain 2.0 for digital finance* and *Blockchain 3.0 for digital society* (J. L. Zhao et al., 2016, pp. 1-2). Bitcoin is part of the first generation. The main difference between real currencies and cryptocurrencies is that the value of cryptocurrencies is independent from governments or other organizations (Schlatt, Schweizer, Urbach, & Fridgen, 2016, p. 22). Acceptance and regulation of cryptocurrencies varies from country to country, and it is widely discussed if they can really be seen as alternative currency (2016, pp. 22-23). For generation 2.0, the greatest promises in the long term are related to rapidity, costs and transparency, according to a survey among financial experts carried out in 2016 (2016, p. 26). The third and last generation comprises all sectors which are not directly linked to finance or cryptocurrencies. It is also the generation which is still in the embryonic phase and only provides scarce practical evidence. Application fields range from automotive, cybersecurity, insurance and real estate to healthcare, voting, education or public transportation, to only name a few (Fluree PBC, 2018). Applications in the journalism industry belong to generation 3.0 as well.

2.1.3   Blockchain innovation on the international and national level

Although blockchain technologies, especially the third generation, are still mostly unknown to the broader public, businesses and governments around the globe have started investing in blockchain projects and are exploring different applications. According to the Global Startup Ecosystem Report 2019 (Startup Genome, 2019, pp. 14, 69, 133), blockchain is the second fastest-growing start-up subsector with a 5-year growth of 101.5%, following Advanced Manufacturing and Robotics (107.9%), and followed by Agtech and New Food (88.8%) as well as AI, Big Data and Analytics (64.5%). To give an international comparison, Silicon Valley, London, New York, Singapore and Toronto-Waterloo take the lead in blockchain innovation. Moreover, Vancouver is listed as the city with the "sub-sector strength" blockchain. Canada does indeed seem to be at the forefront with regard to blockchain. The Blockchain Research Institute counted 400 blockchain or blockchain-related companies in Canada, especially in Ontario (52%) and British Columbia (29%). Quebec (9%), Alberta (8%) and Nova Scotia, Newfoundland and Labrador, and Prince Edward Island (2%) might soon catch up with their sister provinces (Chamber of Digital Commerce Canada, 2019, p. 10). Examples of Canadian blockchain success stories are Ethereum, created by Canadian-Russian Vitalik Buterin in 2013, or CryptoKitties, a blockchain game running on Ethereum developed by Dapper Labs in Vancouver.

Due to numerous knowledge spillover activities, the blockchain industry is predominantly characterized by open business models, i.e., models favoring the exchange of experiences and expertise with other actors in the industry. The three most popular spillover activities are open source software disclosure, white paper publication and conference participation (Park, Shin, & Choy, 2020, p. 68). Especially the "voluntary knowledge or technology disclosure" and "active

knowledge sharing" are characteristics of the blockchain industry (2020, p. 66). The active exchange of knowledge among blockchain start-ups increases "the total amount of knowledge in the industry" (2020, p. 68).

In order to understand the hype about blockchain in the techno-savvy scene, it is important to know the underlying technical basic elements. The next section defines blockchain technologies, and describes the various elements which together form a blockchain network.

2.1.4   Definition and technical description of blockchain

Nakamoto's vision is characterized by a set of technological elements that are interrelated and together form what is known as blockchain. In this section, the term blockchain is defined as well as explained from a technical point of view and in a broader sense, without being limited to the specificities of the Bitcoin network.

Providing a clear and concrete definition of blockchain is problematic since no generally accepted definition exists so far (Seebacher & Schüritz, 2017, p. 14). Seebacher, for example, emphasizes that a blockchain is a "distributed database, which is shared among and agreed upon a peer-to-peer network" (2017, p. 14). Deloitte adds that it is a "digital, immutable, distributed ledger that chronologically records transactions in near real time" (Sallaba, Gramatke, & Mogg, 2017, p. 4). Drescher points out that the blockchain can be seen either as data structure, algorithm, a suite of technologies, or simply a generic term for purely distributed peer-to-peer systems (Drescher, 2017, pp. 33-35). He gives the following definition:

> The blockchain is a purely distributed peer-to-peer system of ledgers that utilizes a software unit that consist of an algorithm, which negotiates the informational content of ordered and connected blocks of data together with cryptographic and security technologies in order to achieve and maintain its integrity. (2017, p. 35)

As the name blockchain indicates, a blockchain network consists of so-called *blocks* that are linked together in a *chain*. A block is the result of a group of transactions such as a credit transfer between two persons.

In other words, as outlined earlier, the principal idea of the blockchain is that the responsibility for approval and storage of transactions between two parties is shifted from a central third party to a network of peers. The underlying metaphor corresponds to the analogy of the law of large numbers: the more witnesses are questioned independently from each other, the higher the probability that the majority tells the truth (Drescher, 2017, p. 40). Complex technological mechanisms described later in this text build the basis for an immutable and indelible protocol of the whole transaction history. Great importance is attached to system integrity, i.e., that data is complete, correct and free of contradictions (data integrity), that the system behaves as expected (behavioral integrity) and that access to data and functionalities can be restricted (security) (2017, p. 6). Due to its rigor and coherency, blockchains are sometimes described as *trustless* technologies. Its evolution triggered the transformation from a system based on trust to a system based on proof (De Filippi, 2018, p. 5).

The technological implementation of these objectives is ensured by the main components of a blockchain network which are distributed ledger technology; mathematical hash functions; consensus mechanisms and reward systems; cryptography and digital signatures; tokens; and optionally smart contracts. Related systems and concepts like Ethereum – the second largest blockchain network –

decentralized autonomous organizations and IPFS can complement the basics of blockchain networks. In the following, all components will be explained in detail and incorporated in the overall functioning of a blockchain network. It is specified in each section if the concepts apply to blockchains in general or solely to the Bitcoin network.

2.1.4.1 Distributed ledger technology

First of all, it is essential to explain the technology that allows all blockchain networks to operate without a central entity. The blockchain is part of the implementation layer of a distributed software system (Drescher, 2017, p. 17). In software architecture, there exist two types of systems: centralized and distributed systems. In order to understand the principal operations within a blockchain network, it is crucial to be aware of the concept of *peer-to-peer systems*. A peer-to-peer system is a particular type of a distributed software system consisting of different *nodes* which represent the computers participating in the system (hereafter also referred to as network participants); in relation to each other, they are also called *peers*. They share resources like processing power, storage capacity or distribution of information. All nodes have equal roles and rights and operate without any central node coordinating transactions (2017, pp. 14-15, 21). Peer-to-peer systems were already developed in the 2000s, with Napster and BitTorrent being the most famous examples (De Filippi & Wright, 2018, pp. 17-18). While the music-sharing service Napster allowed users to connect directly to each other to exchange music files, BitTorrent split files into fractions and stored them on several servers from which they could be downloaded by several users at the same time.

In blockchain terminology, distributed ledger technology (DLT) is the technical term to describe distributed networks. DLT can be classified into three types (Mulligan, Zhu Scott, Warren, & Rangaswami, 2018, p. 6). First, within public, permissionless systems, everybody has permission to participate in the network, to read and also to validate transactions. A copy of the valid ledger is distributed to all peers. Bitcoin and Ethereum, for example, are public and permissionless systems. Second, private, permissioned systems oblige their peers to have read and write permission in order to participate. The third type, permissioned, public systems, are hybrid models of the two former ones. In these networks, only authorized people are able to write on the network, but anybody can access and read the transaction history. The advantage of any of those systems is the difficulty to shut it down; as long as only one single computer has a copy of the blockchain network, it continues to exist (De Filippi & Wright, 2018, p. 22).

2.1.4.2   Consensus mechanism: Proof-of-Work and hash functions

A crucial feature of DLT are so-called consensus mechanisms which can be found in any blockchain network. The blockchain can indeed be compared to a chain that is constantly extended by adding single elements which are called blocks and contain information about transactions. The first important concept which the creation of the blocks is based on are mathematical hash functions. Hash functions are methods to represent a data record as a number with fix length, so-called *hash values* or simply *hashes*. Figure 2.1, for instance, shows the hash values of the two words "Hello World!" according to different hash standards, with SHA256 being the most used one. In general, a hash function can be useful whenever data is stored in different places.

Figure 2.1   Example of different hash standards (Drescher, 2017, p. 74)

Hash functions have four main characteristics which classify them as secure technique to identify and compare data (Drescher, 2017, pp. 72-73):

- *Deterministic.* Identical input data records have identical hash values;
- *Pseudo-random.* Impossibility to predict a hash value; hash values change in an unpredictable manner if input data changes;
- *One-way functions.* Impossibility to conclude input data from hash values (hash functions are irreversible functions);
- *Collision resistant.* Unlikeliness to have the same hash value for two data records (hash collision).

In blockchain networks in general, hash functions allow to calculate hash values of data saved on the network by generating their *hash references*, required to identify storage locations and possible modifications. These hash references represent "digital fingerprints" for the data stored in the block (2017, p. 92). They also serve as *proof-of-existence*, i.e., they allow to verify if a document has existed at a certain point in time (De Filippi, 2018, p. 52).

In blockchain networks like Bitcoin which use the *Proof-of-Work* (PoW) consensus mechanism, hash functions are deployed during the creation process of a new block (see Figure 2.3). The next paragraphs describe the PoW as deployed in the Bitcoin network.

When nodes receive new transaction data which needs to be processed (Step 1 in Figure 2.3), they try in competition with their peers (independence is necessary to ensure network security, Future Today Institute, 2019, p. 46), to generate a new block where they can store the transaction details (Step 2). This is done by a so-called *hash puzzle* (Drescher, 2017, pp. 89-91). The node that first solves the puzzle is allowed to create the new block. The elementary question of the hash puzzle can be formulated as follows: *Which digit, in combination with the input data, would result in a hash value with X leading zeros?*

The number of leading zeros indicates the difficulty level of the hash puzzle and is known upfront. It can vary from block to block (2017, p. 142). The result of the hash puzzle is a simple digit, the so-called *nonce*. Taking into account the four features of hash functions, the only possibility to solve the riddle is by means of trial-and-error. Vice versa, all other nodes can easily verify the result by simply calculating the hash value of the input data plus the received nonce.

Depending on the chosen difficulty level, the resolution of the puzzle can result in high consumption of computing power. If the nonce is 614, for example, 614 combinations have been tested before obtaining the first hash value with X leading zeros (see Figure 2.2). This process is called Proof-of-Work because the solution of the puzzle is the proof that time and computing power have been invested to create the block (2017, p. 92). Another term often used is *mining,* as introduced by Nakamoto; a node that tries to create a new block by participating in the competition

of the hash puzzle becomes thus a *miner*. Depending on the difficulty of the hash puzzle, the Bitcoin network is supposed to create one block roughly every ten minutes (Buterin, 2014, p. 6).

Nonce	Text to Be Hashed	Output
0	Hello World! 0	4EE4B774
1	Hello World! 1	3345B9A3
2	Hello World! 2	72040842
3	Hello World! 3	02307D5F
	…	
613	Hello World! 613	E861901E
614	Hello World! 614	**00068A3C**
615	Hello World! 615	5EB7483F

Figure 2.2   Simplified example of the hash puzzle (Drescher, 2017, p. 91)

A different method to achieve distributed consensus in a blockchain network is the *Proof-of-Stake* (PoS) mechanism, a valuable alternative to the energy-consuming PoW and planned to be deployed for example on the blockchain network Ethereum. In contrast to the Proof-of-Work principle, the node that validates the next block is here chosen according to the amount of stake of the node that is trying to create the block, i.e., the amount of digital currency that the node possesses (De Filippi & Wright, 2018, p. 231). That is, the probability that a node will be selected as validator is equal to the percentage of cryptocurrency he owns. In order to avoid power imbalances, a miner who wins the block creation process cannot participate in the next mining competitions (Blockchain France, 2016, p. 130).

2.1.4.3 Reward system

After the PoW, the creation of the new block on the Bitcoin network is not finalized yet. A sophisticated reward system involving all network participants ensures mutual control about the creation of valid blocks (Drescher, 2017, pp. 155-162). Rewards are a significant element of a blockchain network because they take into account human behavior (Halaburda, 2018, p. 4): peers have to be incentivized to become miners.

The first node that has successfully solved the hash puzzle sends the new block to all its peers (Step 3). The peers then know that they have lost the competition and stop their efforts to solve the puzzle. Instead, they will become sort of arbitrators who validate the correctness of the created block (Step 4). If the block is valid, it is added to the blockchain, its creator will be rewarded and the nodes start mining another block (Step 4a). If a node can prove that the block is invalid, the block is rejected, its creator loses his reward and the competition about the correct hash puzzle starts from the beginning (Step 4b). At this point, cryptocurrencies enter the game: they are the rewards which are distributed from the system to the winning miner. A maximum of 21 million bitcoins will eventually be issued by the Bitcoin network (De Filippi & Wright, 2018, p. 41). If cryptocurrencies were not available as block rewards, the incentive to mine would have to come from outside of the network (Halaburda, 2018, p. 8). It is important to note that block rewards are not the same as mining fees. The issuer of a transaction can optionally attach mining fees to the transaction in order to incentivize miners to prioritize the transaction (Future Today Institute, 2019, p. 47). Similar to a tip paid in order to ensure fast transaction processing, only the miner who creates a new block finally receives the attached mining fees, *in addition to* their basic reward.

The concept of "carrot and stick", the competition mechanism as well as the peer pressure ensure mutual control and the motivation for nodes to create correct new blocks which they can share with their peers (because they do not receive their reward without validation from their peers). However, miners will only decide to participate in the mining process if the expected reward is greater than the computational costs required to solve the hash puzzle (De Filippi & Wright, 2018, p. 41). In other blockchain networks, reward mechanisms can be different. On Ethereum, for example, block creators are rewarded in transaction fees, whereby the amount depends on the bytes in the transaction (Buterin, 2014, pp. 15-16).

Figure 2.3   Creation of a new block inspired by the Bitcoin PoW (own illustration)

2.1.4.4   Distributed consensus for determining valid transaction history

Distributed consensus is not only required for the creation of new blocks, but also for the validation of the blockchain as a whole. As already noted earlier in this chapter,

the idea of a peer-to-peer system is that transactions are not validated by a central institution, but by all participants of the network. Blockchains are in general "first-to-file systems", meaning that if someone tries to process the same transaction in two different blocks, only the transaction that is confirmed first will be valid (Buterin, 2014, p. 1).

Nonetheless, due to simultaneous transaction processing and delays in data transmission (Drescher, 2017, p. 166), it is possible that a node mines a second version of an already existing block with the same parent block but different transaction data, and registers this block in his transaction history (Buterin, 2014, p. 8). In this case, the blockchain structure gets split and starts resembling a tree, whose "false" branches (i.e., the false blocks) are called *forks*. Accidental forks are a particularity of blockchain networks which use PoW like Bitcoin. They can be identified by comparing the hashes of the blocks of the real chain with the hash of the parent block; if they do not match, the alleged parent block is part of a fork (2014, p. 8).

Since system integrity requires coherency of information, the nodes in such networks have to agree about the sole valid transaction history for all nodes. The criterion for this decision is the total computing effort that has been invested in the creation of the blockchain. There exist two approaches of how to define this computing effort (Drescher, 2017, pp. 168-174): either as the *longest chain* (i.e., the chain with the most blocks) or as the *heaviest chain* (i.e., the chain with the highest summed difficulty level). Hence, the probability that blocks are added to the real, valid transaction history increases over time with the addition of new blocks. This mechanism is also called *eventual consistency*.

It is technically false to say that blockchain transactions are inherently immutable – this is true for all blockchains. The possibility to change the transaction history exists, but due to the interconnected nature of the blocks, they are limited and costly to realize. As each block contains the hash value of the previous block, modifications in a certain block would require modifications in all following blocks until the beginning of the chain. This is unappealing for two reasons. First, modifications are disproportionally expensive and time-consuming (2017, p. 138). This is a consequence of the "all-or-nothing approach" (2017, p. 132). When altering data, its hash value would change, triggering the transformation of all following hash values, including the hash value of the blocks. This means that by changing the original transaction data, the hash puzzles need to be calculated for a second time. Second, modifications in the transaction history would be shared with all other nodes, which then would be immediately aware of the fraudulent action. In the case of Bitcoin, the nodes would therefore require the majority of the system's voting power in order to decide which transaction history (which chain of blocks) they determine as the sole valid one (2017, p. 167). The most discussed threat to the Bitcoin blockchain are so-called *51% attacks*. These are attempts of fraudsters to obtain "50% plus 1" of the computing power of the whole system and to solve all hash puzzles in order to control more than half of the voting rights (Drescher, 2017, p. 178; Nakamoto, 2008, p. 1). However, it is harder to acquire a significant amount of computing power than to simulate "a million nodes" (Buterin, 2014, p. 4). The difficulty to overcome these two obstacles has proven to be efficient: so far, the Bitcoin network has not been compromised.

2.1.4.5   Blockchain data structure

DLT as well as consensus mechanisms build the basis for the decentralized nature of a blockchain network and its unique data structure. This section briefly explains the components of a block in the Bitcoin network and the entire Bitcoin chain. First, the solution of the hash puzzle becomes the block hash of the newly created block. Each block consists of the same components: block header, merkle tree and transaction data (Drescher, 2017, pp. 121-122). The *block header* contains the hash reference of the data stored in the block as well as the hash reference of the previous block header. All information about the hash puzzle (nonce, difficulty level, and time stamp in order to identify its date) is also stored in the block header (2017, pp. 139-140). Block headers do not contain data itself, only the hash references. Accordingly, the chain of all block headers can be described as "catalogue" of all hash references (2017, p. 119).

The hash reference of the data represents the root of a so-called hash tree, also called merkle tree (its inventor was Ralph C. Merkle). A merkle tree is an arborescent representation of various hashes which facilitates the verification if a certain transaction has been saved in a certain block (De Filippi, 2018, pp. 21-22). Each leaf of the tree is the hash of its two children, causing the hashes to "propagate upward" (Buterin, 2014, pp. 9-10). The root of the merkle tree refers to more branched hash references which finally point to the actual transaction data saved in the block. Consequently, whenever a transaction is modified and its hash changes, all following leaves above, including the root of the three and thus the hash of the block, would change, too. The most recently added block header is called *head*. All block headers and merkle trees together form the *blockchain data structure*. An illustration of this structure is provided in Figure 2.4.

Figure 2.4   Simplified blockchain data structure (Drescher, 2017, p. 121)

2.1.4.6   Cryptography and digital signatures

The creation of a block and the resulting blockchain data structure are not the only elements in a blockchain network. Specific technologies are further needed to guarantee a secure information exchange. For this purpose, all blockchains make use of *asymmetric cryptography* or *public-key cryptography* (Drescher, 2017, pp. 96-98), a very common method in IT to encrypt and decrypt data by means of a pair of keys. One key can only encrypt data whereas the other one can only decrypt it. This technique allows to generate so-called *digital signatures* (2017, pp. 105-107). If a peer wants to send a message to another node, it first calculates the hash value of this message and then encrypts the hash value with the private key, resulting in a cipher text of the hash value. The recipient of the message can easily validate if the sender is the creator of the message: he both decrypts the message with his public key and calculates the hash value of the message. If both values are identical, the initial message has not been modified and has indeed been signed by the sender, i.e., the sender is the owner of the private key. Asymmetric cryptography is also used to

ensure if a peer wishing to execute a transaction is really the owner of the data (De Filippi, 2018, p. 19). Since personal information is never disclosed on the blockchain network but participants are attributed an identity, this principle is referred to as pseudo-anonymity (Ragnedda & Destefanis, 2020, p. 1).

2.1.4.7 Tokens

Apart from technologies like cryptography and digital signatures which ensure security on the blockchain, *tokens* are further components which help to manage the data traffic on any blockchain network. They can be deployed for two purposes. The more common case is their use as digital currency, for example as bitcoins. In order to execute a transaction on the Bitcoin network, the service has to be paid in tokens by rewarding the miners. In this case, tokens can be compared to chips in a casino. A user has to acquire enough tokens in order to be able to use certain functionalities, and he can sell them when he does not need them anymore. Second, a token can also be assigned to a material or immaterial good, called *tokenization*, allowing to identify it in a unique manner (De Filippi, 2018, pp. 85-88). This mechanism can be applied to any blockchain. When businesses include tokens in their business model as a means to create value for both consumers and the company, this mix of tokens and economic principles is called *tokenomics*.

2.1.4.8 Smart contracts

Using tokens as a digital currency or for tokenization is an example of how the technological possibilities of blockchain can be extended. In the same way, the inclusion of so-called *smart contracts* on any blockchain network is optional, but can

be useful in specific cases (De Filippi & Wright, 2018, pp. 74-76; Ragnedda & Destefanis, 2020, pp. 3-4; Schlatt et al., 2016, pp. 23-25). First introduced by Nick Szabo in 1997, smart contracts can be defined as "cryptographic "boxes" that contain value and only unlock it if certain conditions are met" (Buterin, 2014, p. 13). Those cryptographic boxes are programs allowing to organize interactions between two parties in a legal manner by executing contract details automatically and in real time when a certain external event occurs. Designed as a "self-enforcing agreement" (Ragnedda & Destefanis, 2020, p. 4), the contract then applies the rules determined in the contract and performs a certain action. Contract details are stored in code in the blockchain network, and the contract itself is digitally signed by the involved parties. Contract obligations can be dynamically adapted to changing conditions by communicating with so-called *oracles*, persons or programs that transmit information from outside to the blockchain network. Smart contracts minimize the interaction between two parties and eliminate the need for an intermediary.

With regard to smart contracts, De Filippi and Wright introduced the term *lex cryptographica*, describing "private regulatory frameworks" that "create order without law" (De Filippi & Wright, 2018, p. 5). In the future, smart contracts could create a parallel legal system based on technical rules rather than on legal rules (2018, p. 194), or even bypass existing laws (2018, p. 44). De Filippi's and Wright's argumentation draws upon the conviction that the "best way to regulate a code-based system is through code itself." (2018, p. 194). However, according to the rule of immutability, smart contracts technically cannot be changed once they are deployed. This prevents "opportunistic behavior", avoids misinterpretation of legal terms and decreases the monitoring costs associated with the contract's execution (2018, pp. 80, 82). The flip side of the immutability rule is that dysfunctional code will run regardless of its implications for the involved parties (2018, p. 201). In this case, the smart contract can be forked (similarly to the blockchain structure) − an arduous task

which requires the development and release of a new version – or one can create mutability upfront by storing single parts of the code in different contracts, and their addresses in a modifiable storage (Buterin, 2014, p. 23).

2.1.4.9 Ethereum

The first network which provided the possibility to deploy smart contracts was Ethereum, founded in 2014 by programmer Vitalik Buterin and launched in 2015. As already mentioned, Ethereum is the second largest blockchain network after Bitcoin. Ethereum is a key element of this study since the Civil platform is built upon this blockchain network.

The motivation to create alternatives to Bitcoin was that with the network's increasing popularity, its weaknesses became more and more apparent to users. Transaction processing was slow, and the only functionality was to exchange digital currency (De Filippi & Wright, 2018, p. 27). Therefore, Ethereum should not be seen as a competitor to Bitcoin, but as a separate network with complementary characteristics (Blockchain France, 2016, p. 8). One major difference between Bitcoin and Ethereum is that while Bitcoin only has one sort of account, Ethereum is operating with two accounts: externally owned accounts and contract accounts. The contract account is associated with a smart contract and stores for example its bit code, whereas the externally owned account is linked to a pair of keys. The owner of the private key can send ether tokens (Ethereum's cryptocurrency) to their peers (called *validators* on Ethereum), and interact with smart contracts stored in contract accounts (De Filippi & Wright, 2018, p. 28).

By being "open-ended by design" (Buterin, 2014, p. 20), Ethereum extends the possibilities of a blockchain network beyond cryptocurrency (2014, p. 34) by supporting not only purely financial, but also semi-financial and non-financial applications (2014, p. 19). In addition to smart contracts, the polyvalent nature of Ethereum allows for example to create so-called decentralized apps, or DApps. Basically, DApps are comparable to normal applications who represent the user experience layer of the app, with the only difference that they are built on top of peer-to-peer networks at the back-end, which is invisible for the user (O'Dair, 2019, p. 21). The code in Ethereum contracts, which is written in the object-oriented programming language Solidity, is processed by Ethereum's own virtual machine, called EVM.

As mentioned above, Ethereum has its own cryptocurrency called Ether (ETH) which serves as a means to pay transaction fees (Buterin, 2014, p. 13). Fees have two components (2014, pp. 14-15): the startgas, representing the limit to how many computational steps can be executed, and the gasprice, being the mining fee per computational step. The result of the multiplication of startgas and gasprice is the maximum fee in Ether that the user will have to pay for the code execution. If a transaction stops before the limit is reached, the remaining ether are returned to the user (2014, p. 14). As each computational step has a cost, smart contracts have different prices, influencing user's willingness to interact with it (De Filippi & Wright, 2018, p. 41). Moreover, the transaction fees increase with the number of peers that engage in the blockchain network.

The combination of Ethereum's functionalities (smart contracts, DApps, cryptocurrency transaction fees) could result in two constructs called Decentralized Organization (DO) and Decentralized Autonomous Organization (DAO) which is briefly presented in the next paragraph.

2.1.4.10 Decentralized Autonomous Organizations

In the words of Vitalik Buterin, "[t]he general concept of a "decentralized organization" is that of a virtual entity that has a certain set of members or shareholders which, perhaps with a 67% majority, have the right to spend the entity's funds and modify its code." (Buterin, 2014, p. 23). DAOs extend this idea by establishing a DO that is exclusively governed by automated rules, for example smart contracts. A less capitalistic approach to DAOs could be what Buterin refers to as "decentralized autonomous communities", where members are not shareholders who obtain dividends, but participants with equal rights in decision-making processes.

2.1.4.11 Decentralized file storage systems

Blockchains do not only allow to structure organizations in new and uncommon ways, but can also facilitate data management inside the organization. As large data sets can be expensive to process on the blockchain, alternative off-chain storage can be decentralized file storage systems. In general, these systems are built on top of a blockchain as so-called "overlay networks" and "provide secure and resilient peer-to-peer storage for blockchain-based networks, with no central administration, zero downtime, and the ability to operate even if members of the network leave" (De Filippi & Wright, 2018, p. 30). Therefore, they allow to outsource information and discharge the blockchain from huge amounts of data which could slow down the transaction processing (De Filippi, 2018, p. 50). In order to maintain a link between the blockchain and the storage system and to be coherent with the immutability principle, the hash of the original data is stored in both systems (De Filippi, 2018, p. 50; O'Dair, 2019, p. 33). Modifications in the data would become apparent when the hashes do not match anymore. Decentralized file storage systems could be a way to

avoid the dependence on data storage provided by multinational companies like Google, Facebook, Amazon or Microsoft (De Filippi & Wright, 2018, p. 30). One famous example is the IPFS (InterPlanetary File System) which is also embedded in the Civil ecosystem.

2.1.5   Promises of blockchain technologies

All presented technological components of the blockchain are required to understand blockchain applications and their value. Some applications, like DApps, DAOs or decentralized storage system have already been described. In this section, main promises of blockchain technologies are outlined and explained from a general point of view. It has to be noted that all aspects are interlinked and overlap in some regards.

2.1.5.1   Disintermediation

As embedded in their technical structure, the most distinct feature of blockchain networks is decentralization. In centralized systems, the institution at the core takes the role of a gatekeeper who controls all data passing through the system. It verifies and approves transactions, manages data storage in the form of data bases and decides who is allowed to participate in the network. As described in the previous two sections, the underlying motivation to design blockchain systems was to eliminate the need for these intermediaries. Blockchains provide a high degree of autonomy to their users since the responsibility to monitor activity in the system lies with the peer network. The system's strength is its horizontal structure which requires the network participants' approval to create a valid block. The code is most often available as open source code in order to allow a global developer community to improve it constantly,

and runs automatically on the blockchain network, instead of being governed by one single party (De Filippi & Wright, 2018, p. 44). Due to these characteristics, blockchain networks allow to reduce two types of costs (Catalini & Gans, 2018): the cost of verification (i.e., the individual effort of validating transaction attributes) and the cost of networking (i.e., the cost of starting and running a business). The cost of verification can be limited due to the consensus mechanism, and the cost of networking decreases because blockchain projects have a high potential for network effects. More precisely, by attracting an increasing number of user to the network, the process of expanding this ecosystem even further will become a self-perpetuating mechanism (Mahn, 2019, p. 80). Consequently, any sector operating as intermediary between producer and consumer of immaterial and digital goods and services could be potentially replaced by a peer-to-peer system (Drescher, 2017, p. 21). Banking, assurance and notary services, as well as authorities, or companies like PayPal, Visa, Uber, Apple and Google (Tapscott & Tapscott, 2018, p. 30) could be affected by disintermediation. Apple and Google could be affected by mechanisms like blockchain-enhanced micropayments; because of their services like Apple Pay and Google Pay which contrast the inherent characteristic of peer-to-peer systems to directly connect two different parties, they can be seen as intermediaries. Taking the idea of disintermediation even further, blockchains could eventually serve as catalysts for new forms of organizing which are characterized by "more transparent and less hierarchical" structures, and allow individuals to become involved in decision-making processes without knowing the other participants (De Filippi & Wright, 2018, p. 4). In its ultimate form, these new forms of organizing could materialize in DAOs.

2.1.5.2 Traceability

Furthermore, blockchains can serve as simplified audit tools by making use of the "auditable trail[s]" (De Filippi & Wright, 2018, p. 37) that transactions leave on the indelible transaction history. This could further decrease the cost of verifications post hoc. In public blockchains, every network participant can trace back activity in the blockchain system, either to prove existence or non-existence of data (Drescher, 2017, p. 225). The time-stamping mechanism allows to identify exactly *when* a block has been created, i.e., when a transaction has been settled. By means of digital signatures, it can also be proved *which node* has triggered a transaction (De Filippi & Wright, 2018, p. 37). In some cases, it might be of great importance *in which order* the single transactions were carried out (Drescher, 2017, p. 225). What is more, any modification of data can be uncovered by the erroneous matching of two hash references. Simple methods for revelation of data manipulation decreases the attractiveness for fraudsters to corrupt the system. Therefore, the duplication and interconnection of hash references ensures a higher level of authenticity of data stored in the network.

2.1.5.3 Integrity and security

In addition, integrity and security are further promises of blockchain technologies. Although these two aspects play a crucial role in every type of system architecture, blockchain technologies ensure their preservation in a specific manner. A blockchain network can help to achieve and maintain integrity in a purely decentralized peer-to-peer system that consists of an unknown number of peers with unknown trustworthiness and credibility (Drescher, 2017, p. 31). Prioritizing system integrity allows for example to avoid double-spending, i.e., the unauthorized, repeated

execution of a transaction as for example a credit transfer (Drescher, 2017, p. 50; Tapscott & Tapscott, 2018, pp. 52-53). Another essential part of system integrity is security (Drescher, 2017, p. 6). Due to the use of asymmetric cryptography and digital signatures, it can be verified that the sender of a message has signed it with his private key. It is also guaranteed that confidential data can only be read by the owner of the public key. Moreover, the peer-to-peer character reduces both the risk that a central party runs the network in its own interest, by means of disintermediation (De Filippi & Wright, 2018, p. 44), and that fraudsters take control over the network (by means of the distributed consensus). Nonetheless, security is not an inherent feature of blockchain technologies. The overall system is only as safe as its weakest link (Mahn, 2019, p. 76). Moreover, in the case of permissioned blockchains, cryptography is not enough to protect the system. It must be secured against external attacks like any common database.

2.1.5.4   Decentralized Identities

Combining cryptography and immutable ledgers furthermore provides the possibility to attribute *decentralized identities* to individuals (Lyons, Courcelas, & Timsit, 2019a). By definition, a decentralized identity is a digital identity that is created and controlled solely and directly by its owner (2019a, p. 10). They are also called Decentralized Identifiers, or DIDs. The principal idea is to avoid that central third parties have control over individual identities. By "putting the user at the centre" (2019a, p. 5), he or she will dispose of a "self-sovereign identity" (2019a, p. 14), but is also totally responsible for his or her data. A person could tie relevant personal data to their DID, then obtain credentials from official authorities, and store all that information in a so-called identity hub. With these credentials, the DID could serve as a proof of identity for numerous purposes, for example as a digital passport, driving

license, or permission for electronic voting. This could be an answer to today's fragmented ID landscape where individuals possess numerous digital identities which are issued and controlled by centralized authorities like companies and governments. This makes it currently easy to create fake identities and incentivizes for example for fraudsters to spread fake news. Moreover, as the individual owns his or her DID, no central party could take it away. Even if blockchain technologies are not absolutely necessary to implement the promises of DIDs, it can facilitate their realization, for example by serving as DID registry, or as "notary" which confirms the creation and issuance of credentials by means of timestamps.

2.1.5.5 Proof and transfer of ownership

Closely linked to the concept of decentralized identities are the promises of proving and transferring ownership. Whereas "older" technologies, especially the Internet, focused on the exchange of information, blockchain manages the exchange of value (Mulligan et al., 2018, p. 4; Ragnedda & Destefanis, 2020, p. 1). Tapscott and Tapscott describe the paradigm of blockchain as "world wide ledger of value" (2018, p. 24). On a blockchain, it becomes possible to securely transfer objects in a digital format via the Internet. Due to the shift from a static to a rather dynamic ownership management, De Filippi emphasizes that the term *intellectual property* should be replaced by *property right on digital objects* (De Filippi, 2018, p. 85). This notion implies more vividly that digital assets (i.e., property) can change hands, and that ownership management should hence prioritize the management of rights. For applications involving digital assets, blockchain does not merely provide a proof of existence but also a proof of ownership (Ito & O'Dair, 2019, p. 321). This proof of ownership is backed by the mechanisms of identification, authentication and authorization (Drescher, 2017, pp. 42-44, 196). Digital signatures prove that the

sender of a message is *authorized* to share data. He can then be *authenticated* with his private key, whereas the message can be *identified* with the public key. These technologies which are at the same time part of the security of a blockchain enable a corruption-free management of ownership. They have the potential to decrease the risk of counterfeiting and data piracy, and to establish new norms of rights management. Similar to credentials, the rights status of digital assets could for example be protected by digital certificates that would be digitally signed by an authority that guarantees the validity of the information (De Filippi et al., 2016, p. 9; Ito & O'Dair, 2019, p. 322). With regard to the transfer of ownership, novel forms of royalty payment and more facilitated possibilities to assign licenses are arising. Disintermediation, for instance, promotes a direct transfer of royalties from the owner to the licensee, also called "direct-to-fan model" (Ito & O'Dair, 2019, p. 320). Tokenization, as described in the previous section, provides a possibility to make IP rights traceable and to ensure a fair compensation of the owner of the digital assets in the form of tokens (2019, pp. 325-326). Blockchains might even have the potential to replace traditional forms of IP protection in a large range of business fields, as for example the emission of patents (Savelyev, 2018, p. 554). First efforts to modernize IP management are for example undertaken by Coala IP, BigchainDB or Bernstein.

2.1.5.6 Common truth and trust

Especially ownership and IP management are delicate fields which require high levels of trust and a warranty for true information. Blockchain networks can help to establish both a common truth and a basis of trust. As explained in the previous section, every transaction is indelibly saved in the chain which the distributed consensus has determined as the common and unique transaction history. Due to the resulting transparency of the system and immutability of the data structure, it

becomes possible to establish a *common truth*. Creating a common information base for all network participants makes it possible to increase trust among peers. It is important to understand the difference between the claim that blockchain can create trustless systems and that it enhances trust in the system. De Filippi and Wright summarize the paradox as follows:

> With blockchains, parties can interact with one another even if they do not trust each other – provided that they trust the underlying technical infrastructure and the rules embedded in a blockchain's protocol. (De Filippi & Wright, 2018, pp. 38-39)

In other words, blockchain systems do not require personal trust among individuals (they are trustless), but they reinforce trust of peers in a correct and coherent transaction processing due to the underlying technological mechanisms. Particularly transparency combined with the immutable and tamper-proof character of blockchains has the potential to establish trust in the network. Transparency in blockchain means that parties can review a blockchain and verify that a transaction has indeed occurred (De Filippi & Wright, 2018, pp. 37-38). In public ledgers, this is not only true for directly involved nodes, but also for any individual wishing to trace back activities. For Tapscott & Tapscott, transparency is one of the four principles of integrity which build the basis for trust (Tapscott & Tapscott, 2018, p. 28). They claim that "trust is the conditio sine qua of the digital economy" (2018, p. 57).

By eliminating the need for trust among peers, the blockchain also eliminates the need for knowledge about mutual identity (2018, p. 66). Consequently, a blockchain is able to fulfill two contradictory roles: the underlying technologies offer a high degree of transparency about transaction management while providing confidentiality in a shared and often public network (Drescher, 2017, p. 45). Despite these reflections in mind, truth and trust are highly social concepts, which, applied to technology, will

require special attention, especially with regard to governance. More importantly, it should be noted that blockchains are not able to determine whether the *content* stored in the network is true; the notion of a common truth only refers to the possibility to unambiguously trace back network activity in the transaction history. This problem is also known as the "garbage in, garbage out" problem (Ito & O'Dair, 2019, p. 321): the validation of a block that includes false information will result in the storage of this false information in the immutable ledger. For journalism, this means that human diligence will still be needed for fact checking and the creation of trustworthy content.

Finally, it has to be noted that "blockchain technology should not be a goal in itself but a tool deployed to achieve specific purposes", as Mulligan et al. (2018, p. 3) properly put it. According to the authors and in line with the identified reasons to use blockchains, the five main characteristics of high-potential blockchain use cases are the existence of a shared repository; the presence of multiple writers; the inclusion of intermediaries; minimal trust between the involved parties as well as transaction dependency (2018, p. 8). In any case, it is indispensable to carefully weigh up business needs and not to overestimate the impact of blockchain technologies.

2.1.6   Risks and shortcomings of blockchain technologies

Despite this promising outlook for the future of blockchain-related projects, the technologies also have to be critically assessed. Al-Saqaf and Edwardsson note that the risks of blockchain technologies are not sufficiently taken into account, which often results in a discrepancy between expectations and reality (2020, p. 97). Particularly with regard to the fact that the blockchain is far away from mainstream adoption, risks and challenges for the implementation need to be evaluated.

2.1.6.1   Lack of regulation

The main political concern about blockchain technologies is the lack of laws, guidelines and policies. The technologies are often situated in a grey area, since innovations like smart contracts and tokens are lacking clear explanations. Instead, policy makers, companies and token holders are caught in a "Wild West" (O'Dair, 2019, p. 82) of definitions. According to the Blockchain Research Institute, legal and regulatory issues are the top barrier for Canadian blockchain companies (Chamber of Digital Commerce Canada, 2019, p. 18).

There is a general mismatch between technological progress and legal frameworks. For instance, although national governments made efforts to regulate data traffic on the web, a non-negligible amount of issues, especially concerning copyright, is still uncovered, and international alignments are scarce (Savelyev, 2018, p. 555). Moreover, if De Filippi's and Wright's lex cryptographica will indeed be able to establish an alternative regulatory framework based on code, this will clash with existing national and international legal frameworks (De Filippi & Wright, 2018, p. 6). Certain features of blockchain technologies already collide with existing laws. For example, under the Digital Millennial Copyright Act (US) and the Electronic Commerce Directive (Europe), the fines levied against online companies like Google, Facebook and YouTube can be remitted if they remove infringing content from the Internet. However, this principle is incoherent with the features of a blockchain network: decentralization, immutability and tamper-resistance make it impossible to abide by this law (2018, pp. 123-124). As Tapscott & Tapscott put it, blockchain technologies deprive economy and society of the gift of forgetting (2018, p. 37). This will become a major problem of blockchain projects in Europe where the General Data Protection Regulation (GDPR) provides for the erasure of personal data if an individual wishes to do so. Especially permissionless blockchain networks are

perceived as big challenge by EU policy makers (Lyons, Courcelas, & Timsit, 2018, pp. 16-25). Among other concerns, their "extremely distributed nature" makes it nearly impossible to determine an "identified controller", i.e., a person or legal entity that can be held accountable for activities taking place on the network.

In Canada, The Canadian Securities Administrators (CSA) and Investment Industry Regulatory Organization of Canada (IIROC) stated in a "Proposed Framework for Crypto-Asset Trading Platforms" published in March 2019 that the "well established crypto assets that function as a form of payment or means of exchange on a decentralized network, such as bitcoin, are not currently in and of themselves, securities or derivatives. Instead, they have certain features that are analogous to existing commodities such as currencies and precious metals" (Joint Canadian Securities Administrators/Investment Industry Regulatory Organization of Canada, 2019). The Securities and Exchange Commission in the US was making a similar announcement in June 2018 where it acknowledged that Bitcoin and Ethereum are not securities (Hinman, 2018). Although projects and activities related to cryptocurrencies and blockchain will be subject to special investigations, these concessions could be first harbingers that Western governments start seriously considering the adoption of the technologies at large scale. It is a matter of fact that policy makers have to tackle technological innovations, not only on the national, but also on the international level because blockchain networks and cryptocurrencies operate beyond borders (De Filippi & Wright, 2018, p. 4). Even if it will not be an easy task, the possibilities to unite legal frameworks with technical rules exist. For example, one approach to address the dilemma of immutability and confidential information could be to store personal data off-chain, thus protecting privacy and enabling erasure (Mahn, 2019, p. 79).

2.1.6.2   Hidden centralization

What is more, blockchain technologies could be misused by institutions and even governments (Tapscott & Tapscott, 2018, p. 47) thus contradicting the core idea of decentralization and distributed power. The government of China, for example, is working on a digital version of the renminbi raising questions about the real decentralization of this cryptocurrency (Ricci, 2019). Libra, the digital currency currently developed by Facebook, has also sparked off a controversy about its market dominance and its potential to control user data. Furthermore, the lobbying power of third parties has to be taken into account. Incumbents who benefit from existing systems and technologies would not support the large-scale adoption of blockchain networks, "for the same reason that turkeys would not vote for Christmas" (O'Dair, 2019, p. 64).

On a technical level, centralization is a concern as well. In the Bitcoin network, one single node requires   more than 280 GB of disk space as of July 2020 (Blockchain.com, 2020), making it difficult for lay persons to participate as miners. One possibility to circumvent this problem is to become a so-called "light node", which download only those block headers and branches that are linked to relevant transactions. In this way, they can verify the PoW without storing the whole blockchain locally (Buterin, 2014, p. 10). However, the pitfall of this approach is that mining is to a large extent performed by professional mining pools called application-specific integrated circuits (ASICs), who combine their computational resources in order to increase the probability of mining a block – and then share the block rewards and transaction fees (De Filippi & Wright, 2018, p. 40). Ordinary people who want to verify transactions rely on these pools who provide the corresponding block headers (2018, p. 32). This *Mining Centralization* is already an integral part of the two major blockchain networks: by the end of 2017, four mining pools controlled over 50

percent of Bitcoin and two mining pools more than 50 percent of Ethereum (2018, p. 40).

2.1.6.3   Social resistance

In addition, blockchain "is not just a new technology; it is a new mindset" (Lyons, 2018, p. 21). Along with technological challenges, the extent of consumer acceptance cannot yet be estimated. So far, blockchain and its potential is especially discussed in specialist circles while for the broader public, the technologies remain a black box (2018, p. 21). A possible scenario is thus that users resist and oppose the new technology because the incentives to participate in the blockchain network are not big enough or because they fear major structural changes like job losses (Tapscott & Tapscott, 2018, p. 46). As it is too early to judge the impact of blockchain technologies on society, De Filippi and Wright are right by saying: "Only time will tell whether blockchains will transform and seep into the fabric of society" (De Filippi & Wright, 2018, p. 209).

2.1.6.4   Technical immaturity

Not only is society immature, the technologies themselves are not yet ready for large scale implementations either. A wide range of technical elements would require improvement: latency, throughput, size and bandwidth, usability, scalability, and wasted resources (Yli-Huumo et al., 2016). The impossibility to achieve scalability, decentralization and security at the same time is called the trilemma of blockchain technologies (Lyons, Courcelas, & Timsit, 2019b, p. 10). By combining two of the three characteristics, the third one is automatically excluded: a decentralized and

secure network is too slow to attain scalability; if it is characterized by decentralization and scalability, it cannot be secure; by designing a secure and scalable network, there will be no decentralization. Therefore, businesses have to decide which two characteristics are most important for them, and then forgo the third one.

Even if this trilemma can be solved one day, distributed ledgers should not be implemented as the panacea for any business problem. Quite to the contrary, they can only be applied to very specific cases (Halaburda, 2018, p. 9), for example if a third party has to be paid to establish trust (Mahn, 2019, p. 76). Taking into account the fact that decentralized networks are "inherently less efficient" than centralized ones (Future Today Institute, 2019, p. 46), what is referred to as "blockchain technologies" are actually concepts that do not require a blockchain network to be implemented. Cryptography and smart contracts, for example, are not tied to a distributed ledger, but represent separate concepts (Halaburda, 2018, pp. 3-4). Having said this, the side effect of technological immaturity might be that blockchain technologies are currently "overhyped" by their proponents. The use of the buzzword "blockchain" for marketing purposes can facilitate the funding of a specific project (Erkkilä, 2019, p. 23).

Future progress on the field will hopefully even out the illusions of blockchain evangelists and the resistance of blockchain critics. Despite the uncertainty of the status quo, Iansiti and Lakhani, professors at Harvard, continue to be positive: they are convinced that blockchain technologies will transform businesses, the "very big question is when" (Iansiti & Lakhani, 2017, p. 11).

2.1.6.5   Environmental concerns

Last but not least, the implementation of blockchains, especially caused by PoW, leads to a big environmental concern. According to a study from Bitcoin expert Alex de Vries (The Economist, 2018), the PoW process requires 22 terawatt-hours (TWh) per year which corresponds to the energy consumption of Ireland. In comparison, Google needed 5.7 TWh in 2015. Other sources, like the bitcoin Energy Consumption Index (Digiconomist, 2018), report that in August 2018, Bitcoin's energy consumption reached an all time high of 73 TWh, exceeding more than one-fifth of Britain's energy use (The Economist, 2018). To further illustrate the scale of the problem, Digiconomist shows that one bitcoin transaction uses more than the double of the energy amount necessary to process 100,000 VISA transactions. This said, bitcoin could for example power more than 60% of the energy consumption of the Czech Republic. It is clear that without a sustainable solution to this problem, a universal realization of blockchain technologies in whole industries is far from viable. Especially with regard to the current climate crisis, alternative approaches like PoS are indispensable. In contrast to PoW, PoS is based on a different consensus mechanism forgoing the competitive solution of the hash puzzle and thus consuming less energy. PoS, as such or in slightly modified form, is already deployed by well-known blockchain networks like EOS and Steem. The persistent popularity of PoW over PoS stems from the fact that the investment of high amounts of energy is a more secure way to keep fraudsters out of the network and to avoid manipulation (see *51% attacks*), a criterion that corresponds to the blockchain ideology of ensuring safe and tamper-proof transactions.

By looking at these challenges which one might confronted to throughout the practical implementation of a blockchain project, it becomes clear that certain positive consequences of the technologies are still visionary thinking. Risks and

threats should not be neglected; instead, a careful weighing of promises and challenges is essential to the success of possible realizations. In order to illustrate all blockchain-related concepts (technical terms, promises and risks), Figure 2.5 provides a graphical overview of this section.

A thorough evaluation of the business area where the blockchain network should be deployed is of great importance. Therefore, the next section explores the current challenges of the journalism industry by taking into account the technical disruptions that led to its status quo.

Figure 2.5   Summary of key concepts related to blockchain

2.2 The current situation of the journalism industry

Before linking the enumerated promises of the blockchain to the concrete case of the journalism industry, it is essential to outline why the industry could develop an interest to use the technologies. This section portrays the historical development of technology in journalism by summarizing major disruptive innovations, i.e., technologies which initially do not meet customer needs (in the following, journalists), but have a high potential to outperform them later on. Subsequently, current perturbations and challenges are discussed, building the basis for section 2.3.

2.2.1 Disruptive technologies in the journalism industry

The history of journalism was not an unambiguous and linear evolution, but constantly disrupted by new professional standards, social developments and, as this study seeks to explore, technological advances. This section summarizes the most important technological changes and "turning points in media history" (Wilke, 2014, p. 103) and explains how it affected the work of journalists and news workers. It should be kept in mind that even if history is marked by "thrusts and leaps" (2014, p. 103), disruption does not focus on events, but should rather be seen as a process. In most respects, this process that has been taking place inside newsrooms for years has not been linear and straightforward, but often "long and messy" (Mari, 2019, p. 93).

From a global perspective, technological development materialized in three stages: from mechanical to electric to electronic (Wilke, 2014, p. 103). Before entering the electronic period, three principal inventions shaped the history of journalism. In the mechanical phase, the epitome of disruption in journalism is without doubt the invention of the printing press by Johannes Gutenberg in the middle of the 15th

century. This technology triggered a fundamental shift of the understanding of the public sphere. For the first time in history, citizens had the possibility to debate about events, and to criticize those in power (Baecker, 2018, as cited in Aguigah, 2018).

In the mid-19th century, journalism experienced a revolution with the invention of the telegraph. This electric technology can be considered as disruptive inasmuch as it had "the power to annihilate time and space" (Fickers, 2014, pp. 35-36), enabled faster information exchange and made information transfer immaterial and intangible (Wilke, 2014, p. 81). Moreover, it introduced a new form of communication because transported messages needed to be short (Fickers, 2014, pp. 32-33). For the first time in the history of news reporting, the news indeed covered the most recent events without being obsolete, compared to times when correspondence was disseminated by ship (Wahl-Jorgensen, 2014, p. 270). Even more importantly, the telegraph shaped the "mosaic image" of the press, allowing to mirror the diverse communal life as "group-image" (McLuhan, 1964, p. 213). McLuhan notes that while the "processing and moving of information" has not been a core element of the mechanical age, it became the central business and "crucial commodity" in the electric era (1964, pp. 206-207).

The third disruptive technology of the pre-computerization era is the typewriter. It had − strictly speaking − initially been a mechanical invention prototyped in the 18th century, but its mass usage only caught on in the beginning of the 20th century (Oxford University Press, 2019c). Like the telegraph, the typewriter accelerated and facilitated the writing of texts because it allowed for fast typing and a uniform layout, and because it skipped the step to produce text first by hand. The typewriter is indeed the mechanical brother of the personal computer, whose QWERTY keyboard is a relic of the non-electronic age.

One could add the telephone to the list of disruptive technologies; however, in a wider sense, it can be seen as an extension of the idea of the telegraph that shares basically the same characteristics. Radio and television are not defined as disruptive technologies, neither, because they do not only represent *tools* for news workers, but were developed as new *media*. In the words of Fickers, they are objects and medium in one (2014, p. 42), hence constituting a competitive threat for the traditional press.

In recent years, technological developments occurred in increasingly shorter intervals (Wilke, 2014, p. 102). While the notions of timeliness (Mari, 2019, p. 94) and simultaneism (Fickers, 2014, p. 35) have ever since become an integral part of journalistic practices, new paradigms emerged. Will Mari (2019) outlines the history of disruptive journalism technologies from 1960 to 1990, a period which was mainly dominated by the introduction of computer technologies. Although his study focuses on the American journalism industry, main disruptions can also be applied to the context of other Western newsrooms. It took a significant amount of time until technology became fully democratized in the newsroom. In the embryonic phase of technological development, the use of computers was reserved to a small group of employees in news organizations and limited to some specific "niche" problems such as deciphering payroll schedules or monitoring ad production. The first attempts to computerize journalistic processes was the integration of story monitoring and viewing software and editing systems which needed cathode-ray tube (CRT) displays, as well as software for grammar analysis and layout which should allow newspapers to keep up with radio and TV. Although computers allowed to accelerate certain processes, they had not yet led to disruption in the newsroom.

The first technology of the second half of the 20th century that had a considerable impact on journalistic work is optical character recognition (OCR), a "pattern recognition software that analyses the shapes of graphical letters in scanned images of

text and transforms them into alphanumeric characters in digital form" (Oxford University Press, 2019a). It was one of the first technologies which enabled news workers to accelerate and enhance typesetting and text editing. However, it did not include automated processes; humans had to revise the final outcomes and correct errors on paper which sometimes proved to be even more time-consuming than without the technology.

While the 1950s, 1960s and early 1970s were characterized by technological experiments, the increasing interest in VDTs in the 1970s announced a real disruptive phase in journalism during which newspapers would begin to integrate technologies at large scale. Although the two technologies co-existed in the beginning, compared to VDT, OCR was a "stepping stone" (Mari, 2019, p. 20) to the computerization of journalism that turned out to be only "minimally disruptive" (2019, p. 19). One major difference between OCR and VDT was that VDTs were designed as "what you see is what you get". Consequently, they proved to be more efficient and faster, allowed for a better control of word processes by being less error-prone, could be used for layout, and eliminated the need for paper. Moreover, their computing power was more and more tied to minicomputers and disk-based storage systems, providing potential for larger processing capacities. Given that it was complicated to simultaneously use OCRs and VDTs in the newsroom, VDTs finally replaced OCRs, leading to a decline in OCRs in the late 1970s. In terms of work efficiency, VDTs seemed indeed to be a "positive additive force" (2019, p. 51) which mostly "enhanced and added to, and did not so much upend, existing news routines" (2019, p. 55). VDTs provided complementary abilities, for example the processing of images and graphics and the introduction of first digital archives. Newspapers therefore heavily invested "time, trial and money" (2019, p. 29) in VDTs (a huge financial burden for small and large news organizations, even when the technology's prices started to decline) and in training their employees. Such measures were meant to provide workers with the

necessary skill set, and to eliminate attitudes characterized by fear and resistance. While mechanical workers were the ones whose jobs were really threatened by technology, journalists could adapt to the new situation – their work did not vanish but was being disrupted. Therefore, as the tasks between writing and production began to overlap, journalists had to "upskill", "deskill", "reskill" (Zimmermann & Schreiber, 2014, p. 16) and "multiskill" (Mari, 2019, p. 94). The willingness to appropriate new technologies in different ways offered news workers a rich spectrum of applications and affordances (2019, p. 32). By creatively combining "technology and organizational features", these affordances can then have an impact on "organizational form and function" (Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007, p. 750).

The increasing computerization of the newsroom not only changed work practices and processes, but the new zeitgeist also reshaped the attitudes and mentalities of journalists. The rejection of new technologies was soon taken over by enthusiasm about the abilities they offered. During the 1980s, which were characterized mainly by optimistic attitudes towards technological advances, the shared VDTs were so sought-after that it was difficult to get a free terminal. The increasing use of VDTs also required higher processing power and memory – the terminals became "smarter". In the mid and late 1980s, faster, cheaper, smaller and more powerful machines compatible with different operating systems paved the way for the global implementation of computers in large and small news organizations. Stand-alone desktop computers with own memory and software finally introduced the ratio *one reporter, one computer* which made digital processes in journalism available to any news worker at any time. Compared to the collective and shared use of VDT terminals, the introduction of personalized computers enabled a more decentralized and individual use of technologies in the newsroom. Portable VDTs furthermore facilitated on-site and almost real-time news reporting, and proved to be faster and

easier to use than phones. Portable computers and laptops became a "powerful extension of journalistic identity" (Mari, 2019, p. 73) – it has remained like this until today. Home computers represented another innovation because they allowed journalists to work more independently and autonomously.

In the late 1980s and early 1990s, the omnipresence of VDT and computers had changed the definitions of journalistic work. After 1985, software which is still used today found its way into the newsroom: CMS, improved word processing tools, digital archives, research tools and databases. Hence, computers were no longer used for a single task, but supported the whole news production process. Furthermore, still a widely discussed social phenomenon today, the computerization affected interaction and social behavior inside and beyond the newsroom; communication started taking place in a virtual space, hierarchies between editors and reporters became more flattened, the contact to sources was more intense, and the exchange with other journalists was facilitated. Nevertheless, newspapers kept their traditionally closed model where content production, manufacturing and commercialization were owned and vertically controlled inside the organization, exclusively relying on internal knowledge and resources (Cozzolino, Verona, & Rothaermel, 2018, p. 1179).

The Internet era as the next and so far latest technological breakthrough – widely discussed, glorified and demonized at once – has been incarnating the most challenging reality for journalism. Three phases accompanied the development of the news industry from 1990 until today (Macnamara, 2014, pp. 61-72; Ragnedda & Destefanis, 2020, pp. 2-3). Throughout the 1990s, first websites, search engines, chats, blogs and Internet ads mushroomed on the Web and offered a new marketplace for journalism. This Web 1.0 was characterized by static information and a top-down approach where publications from content producers to consumers constituted the only way of interaction. Moreover, due to the growing organizational need to adopt to

the digital environment, news organizations began to experience an increasing integration of editorial and business departments in the late 1990s, which was in sharp contrast with the traditionally strict separation of these two fields of activity since the early 19th century (Cornia, Sehl, & Nielsen, 2020, pp. 174-175).

In retrospect, the period between 1990 and 2000 can be seen as an experimental phase that finally ended in the crash of the dot.com bubble. Nevertheless, it paved the way for the more dynamic and proactive Web 2.0 (2001−2010) which enabled interaction, participation, user-generated content and hence, two-way communication. Macnamara relates a range of "C-words" to this phase of the history of the Web: connectivity, communication, community, co-creativity, collaboration, collective intelligence, and conversations. In other words, this novel paradigm was not fueled by new *technologies* in the first place, but by new media *practices*. It was also the hour of birth of tech giants like Google, Facebook, Amazon, eBay, YouTube, Wikipedia and Twitter, since then executing centralized control over their platforms. Approximately in 2010, Internet services entered Web 3.0, an "intelligent" extension of Web 2.0 which makes use of technological innovations like machine learning, artificial intelligence or data mining. Even more importantly, Web 3.0 focuses on the transfer of value and decentralization, aiming to make institutional bodies or companies controlling content redundant. In view of their decentralized nature, blockchain technologies are part of this latest phase of the Web.

Mari finds that viewing the advent of the Internet in the newsroom as the latest disruption in journalism fails to capture the diverse and multi-layered changes it resulted in. He suggests not to see the Internet as "one single disruption of the newspaper industry, and newsrooms, but as part of a series of disruptions, some more profound than others [...]" (2019, p. 62). In modern journalism, disruption has got a different dimension. While "journalism pushed the boundaries of what was possible

with information technology" (2019, p. 94) before Google and Amazon invaded the market, the most important disruptions nowadays are not caused by industry players any more, but by those tech giants. These disruptions, however, cannot be defined as innovations in the sense of disruptive technologies in journalism: Google, Amazon, Facebook, Apple and Microsoft (GAFAM) disrupt the traditional news business model by taking over the advertising model and adopting it to a new technological context. As a consequence of the GAFAM's power, growth in innovation in Digital Media is in sharp decline, although 20.7% of all global start-ups are operating in this sector (Startup Genome, 2019, pp. 51, 54). In contrast, only 2.7% of all global start-ups are blockchain start-ups, but have a more considerable growth potential.

2.2.2 The local context of the journalism industry in Quebec

As journalism should be seen as a "craft of place", characterized by strong localism, it is especially complex to outline its global history (Carey, 2007, p. 4). In addition to the general developments in the industry described in section 2.2.1, the present section seeks therefore to outline the particularities of the journalism in Quebec. This small portrait has two purposes. First, due to the serious difficulties of the news sector, the Quebec case serves as a concrete illustration of how past (technological) developments have shaped the journalism industry. Second, it provides essential background knowledge for situating the experts' assessment, presented in chapter 4, in the appropriate industry context.

The most striking characteristic of the media landscape in Quebec is its unusually high concentration. From the perspective of media political economy, the financialization and capitalization of the economy have not passed over the media industry (Winseck, 2010, p. 366). The Center of Media Studies (CEM) found in 1997

that Canada has the most concentrated market for print media of all Western countries (Crowther, Thibault, Salamon, & King, 2016, p. 4).

Canadian media are foremost in the hands of private companies: The two competitors Gesca and Québecor are the leading media groups who own a significant part of Quebec's dailies, local newspapers and news sites. Together, they held a market share of almost 70% in 2014 (Giroux, 2015, p. 6). Other important players are Groupe Capitales Médias (until 2019), Métro Média and Transcontinental; HuffPost Québec (owned by Verizon in the US); Le Devoir and La Presse (both independent); as well as Bell Média, Cogeco, Rogers, RNC Média and the Canadian Broadcasting Corporation which also possess radio stations (2015, pp. 4-5). The Quebec press is hence controlled by a strong oligopoly which also extends to the most popular news platforms who belong to Gesca, Québecor and Radio Canada (2015, pp. 13-14). The same level of concentration can be found in Canada as a whole where 73% of all dailies were controlled by only 5 ownership groups in 2015 (Crowther et al., 2016, p. 10).

Despite this particular market structure, Quebec newspapers face the same challenges as newspapers elsewhere: nose-diving ad revenues, which declined by 39% from 2005 to 2014 for Quebec's dailies, as well as increasing unwillingness among young people to pay for news (Giroux, 2015, pp. 15-16). In 2018, 53% of the population in Quebec claimed to read a daily on a regular basis (Centre d'études sur les médias, 2019). Among the 18 to 25-year old, the percentage was 39% compared to 63% among the 65-year old and elder. When looking at the principal daily newspapers in Quebec (Le Devoir, Le Journal de Montréal, La Presse, The Montreal Gazette, 24h, Métro, Le Journal de Québec, Le Soleil), this trend becomes even more obvious. When asked about their readership behavior, only between 9% and 11% of the youth say they have consumed one of those dailies in the previous week while regional

newspapers like Le Nouvelliste (Trois-Rivières) and Le Quotidien (Chicoutimi) attract a devastatingly small amount of 4% in this age group; for Le Devoir, the share accounted for 15%. Le Devoir is also the only newspaper among the principal dailies that registered an increase in readership of 4% since 2016. Its counterparts have to cope with great losses, for example La Presse, which reported a decrease in readership of 10% in only one year from 2017 to 2018. The behavior of the readers clearly plays in favor of digital news. Whereas in 2017, a slightly higher part of Quebec citizens accessed information in paper form (40% compared to 33% in digital form), the distribution is equal only one year later (36% for both print and digital).

Compared to Canada as a whole, Quebec's scores appear comparatively acceptable (Centre d'études sur les médias, 2019). In 2013, 48% of all Canadians read a daily on a regular basis (57% in 2001), compared to 34% of the 18-24-year old (51% in 2001). Since then, the numbers might have declined even further. Social media are on the rise in Canada for staying informed; according to the Reuters Digital News Report 2019, online news including social media are the most used news sources (followed closely by TV), with Facebook being the most popular social network for news (Newman, Fletcher, Kalogeropoulos, & Nielsen, 2019, p. 125). Nevertheless, citizens access online news sources for free: only 9% of all Canadians pay for news on the Internet − the same percentage as in France. In the US, this share is at 16% (2019, pp. 85, 119, 125).

Due to the small market size, newspapers in Quebec have to rely on more limited financial resources than for example those in France, the UK, the US or even the rest of Canada (Giroux, 2015, p. 15). Financial bottlenecks cause traditional newspapers to employ journalists for temporary contracts. An important part of the Quebec journalism workforce are working as freelancers for several media companies at the same time, often forcing them in precarious working conditions. In addition,

freelancers may be exposed to a poorer copyright protection (Association des journalistes indépendants du Québec, 2019). Moreover, due to their financial difficulties, Quebec newspapers are less and less able to pay for news services like the Canadian Press which subsequently are also forced to cut their offer (Papineau, 2019). The shift from print to digital news has also an impact on publishing. As a response to a declining print circulation, the Montreal-based newspaper publishing company TC Transcontinental, for example, had to close one of its plants in 2017 (La Presse Canadienne, 2017). Among newspapers, Journal de Montréal and Journal de Québec are the last ones in Quebec to offer print editions seven days a week (Newman, Fletcher, Kalogeropoulos, Levy, & Nielsen, 2018, p. 118). With regard to ownership concentration, Quebec is hence caught in a vicious circle: economic pressure caused by dense competition forces media companies to adapt, often in form of economies of scale and M&As in order to benefit from synergy effects (Giroux, 2015, p. 16). The consolidation of oligopolistic structures is furthermore favored by the lack of appropriate market regulation and legislation about media ownership (2015, p. 15).

The government assumes a key role, however, in providing financial support to media companies. In comparison to their anglophone counterparts, journalism experts in Quebec consider government intervention a legitimate regulatory measure (Brin & Soderlund, 2010, p. 580). In October 2019, Legault's government guaranteed the press an annual financial injection of $50 million starting of 2023−2024, including a refundable tax credit equivalent to 35% of the salaries they have incurred (Bélair-Cirino, 2019). Heavy taxation of tech companies, however, is not envisaged, although the federal government could have collected $288−354 million in 2014 ($350−464 million in 2020) and provincial governments $188−294 million ($296−478 million in 2020) in this way, according to a paper published by media expert Richard Stursberg (2016, p. 2). Legault also refuses to cut government ad expenses on Google,

Facebook & Co. and instead appeals to the responsibility of Quebec citizens to support their local newspapers (Chouinard, 2019b). The same is true for the federal government which announced a $595-million aid for Canadian newspapers in late 2018, comprising tax credits for media companies employing journalists, a tax credit of 15% for Canadian subscribers, as well as measures facilitating fundraising for non-profit media organizations (Leblanc, 2018). However, it does not concede ad investment in local media, and excludes several types of media, for example broadcasters, tiny outlets and specialized media. These measures which will come into force in 2020 make the package one of the most extensive of its kind globally (Newman et al., 2019, p. 124).

The government is also an important pillar for concrete and swift action. The most recent case which illustrates that the news ecosystem in Quebec is "out of balance" (Crowther et al., 2016, p. 5) is the demand of Groupe Capitales Médias (GCM) for governmental financial aid in August 2019. The company had accumulated a total debt pile of up to $26 million and registered a loss of $6 million loss in the first half of 2019 (Chouinard, 2019b). According to Winseck, high debt levels are the main reason for financial troubles in Canadian media companies (2010, p. 383). In response, the Quebec government granted a rescue package of $5 million until the end of December although GCM claimed to run out of liquidity already in mid-November. The future of the six local newspapers (out of twelve published in Quebec) owned by GCM meanwhile remained unclear until the end of 2019; Québecor and Métro Média showed interest in an acquisition. Big Canadian players such as Québecor are known for their radical "slash and burn" approach, including tremendous cuts in personnel and the centralization of operations (2010, p. 386). However, the Quebec government decided to adopt a cooperative model for the six local newspapers of GCM in November 2019 (Chouinard, 2019a).

Already in 2010, in a study about the state of convergence in the Canadian media landscape (Brin & Soderlund, 2010), experts expressed concerns about the "centralization of editorial control" in large media organizations such as Québecor (2010, p. 580). Although some experts addressed the need to reinvent traditional business models (e.g. through a greater focus on local and investigative journalism and commentary), "no one saw the situation as catastrophic" (2010, p. 578). This finding may seem surprising in view of the fact that already in 2010, first signs like cuts in personnel and newspaper size or the cancellation of print editions indicated the urgency of the situation. However, it illustrates a lack of action in earlier years which might partially explain why media companies today struggle to adapt to the fast-changing technological environment. Crowther et al. find that "systemic failures" on behalf of the media as well as the government, not "unfortunate coincidence" or a "product of chance", favored the development of the current media system (2016, pp. 4-6). Winseck laments that instead of investing in long-term innovation, Canadian media organizations had served as "cash cows" (Winseck, 2010, p. 384). Research shows that "[...] where traditional enterprises have been slow to adapt [...] a lack of innovation is likely to erode the economic viability of incumbent media industries" (Pavlik, 2013, p. 184). Pavlik goes on by criticizing that "traditional media have been slow to integrate [these] emergent technologies into their business practices or monetize them substantially or utilize them effectively to create new content forms, engage the citizenry or reinvent methods of work" (2013, p. 184). In the terms of Rogers' diffusion theory, news organizations have never been *early adopters* of new technologies, but rather tended to circumvent or delay the adoption, mirroring Curran's thinking pattern *continuity*. Although early adopter strategies are not necessarily more beneficial than late mover strategies (Park et al., 2020, p. 66), suppression and passivity have resulted in today's state of precariousness, accompanied by a range of challenges that affect nearly any element of the traditional business model. In the words of Winseck, these challenges are the materialization of a "continuation of long-term trends, rather than a crisis" (2010, p. 369). The next

section maps these "long-term trends" by taking into account the influence of external forces (competitors, audiences, society, politics).

2.2.3 Current trends and challenges

The economic, technological as well as social developments which accumulated over the last decades as well as long inertia in the industry place modern journalism in a reality that is characterized by numerous challenges. As an attempt to respond to James Carey's reproach that journalists ignore the history as well as the future of their profession (2007, p. 3), this section maps the principal economic and social constructs that have emerged over the last decades, and, merged together, form the status quo of the news industry in the 21st century. The section is inspired by categories identified by Macnamara (2014).

2.2.3.1 Concentration of media ownership

Resuming the oligopolistic market structure in Quebec, this economic dynamic can also be observed in Canada as a whole. In 1980, the Kent Commission became the epitome of the alarming state of the Canadian media market. The commission was a response to the closure of the two newspapers The Ottawa Journal and The Winnipeg Tribune which allowed their owners Thomson Newspaper Ltd. and Southam Inc. to obtain a monopolistic position by controlling the sole remaining newspaper in their city, the Winnipeg Free Press (Thomson) and the Ottawa Citizen (Southam). The commission's report from 1981 included a list of recommendations which, however, have never been put into practice or gone beyond bills (Skinner, Cross, & Hackett, 2016, pp. 83-89).

Also in other countries, especially in the United States, concentrated ownership influences the state of the media. Back in 1997, McChesney already compared the American media industry to a "cartel" or a "private club" (Chomsky & McChesney, 2004, p. 125). A major concern of the concentration of media ownership is that it favors the blurring of the borders between editorial policies and commercial interests (2004, p. 135). For example, big media conglomerates can unintentionally have a negative impact on the success rate of small newspapers by implicitly shaping a dominant, market wide mentality. As W. H. Kesterton properly put it in 1967:

> In the large newspaper groups, ownership is an impersonal corporate ownership, more likely to impose an attitude indirectly than to intervene overtly in the internal editorial workings of the newspaper. This often means that wealthy owners and ownership groups tend to dominate Canadian journalism by preventing weaker entrepreneurs from starting successful opposition journals rather than consciously imposing a monolithic ideology on their own newspapers. (1967, p. 84)

Despite Kesterton's focus on traditional media, Winseck correctly notes that the Internet is not immune to consolidation (2010, p. 380). This does not exclude web giants like Google or Facebook; Facebook, for example, does not only run its social media platform, but also owns other popular applications like WhatsApp and Instagram. One could thus argue that concentration of media ownership is one of the principal timeless threats to a healthy and diverse media environment.

2.2.3.2 Convergence

As a side effect of the concentration of media ownership, different media increasingly converge, meaning that reporting techniques as well as content presentation of newspapers, television, radio and the Web are more and more overlapping in the

digital world (Jenkins, 2006, as cited in Macnamara, 2014, p. 71). Formerly strictly separated forms of media now compete with each other by entering markets which formerly were exclusively reserved to other media (Chomsky & McChesney, 2004, p. 137). In Canada, convergence has emerged later than in other countries (Winseck, 2010, p. 381), but nowadays, telecommunication companies like Bell, Cogeco or Rogers own radio stations and even news outlets, thereby fueling ownership concentration even further (Nielsen, 2016, p. 65).

2.2.3.3 Disaggregation

The absence of clear boundaries between different forms of media is supplemented by the dissociation between the medium itself and its individual content on the web. By detaching content and medium, online news platforms allow readers to filter information and consume "news segments à la carte" (Christensen, Skok, & Allworth, 2012, p. 15) according to their interests rather than being exposed to the traditional mix of information and advertising (Macnamara, 2010, p. 22; 2014, p. 291). The association of medium and content is all the more important given that the trend to classify and sort out news is rooted in the natural desire to consume only the content which corresponds to one's personal interests, and to ignore the rest (Volokh, 1995, p. 1828). For McLuhan, the traditional mosaic form of the media determines "its complex dimension of human interest" (1964, pp. 204, 207). Moreover, it confronts readers with events and viewpoints that do not correspond to their interests (Volokh, 1995, p. 1834). In turn, disaggregation threatens extensive and comprehensive opinion making, instead favoring biased and one-sided perspectives by locking audiences in so-called filter bubbles. This effect principally materializes on social networks where algorithms control the content which is displayed to a person, but also concepts like tailor-made news feeds, news alerts or newsletters conceived by

traditional media allow audiences to get their news in a dense, compacted format and hence contribute to the disaggregation process.

The increasing need to filter news is favored by the increasing offer of information that readers have to process. A shift "from scarcity to plenitude" (Macnamara, 2014, p. 304) has resulted in an eternally descending "information avalanche" (Wilke, 2014, p. 105). 28% of Canadian respondents of the Digital News Report say that they are "worn out by the amount of news there is these days" (Brin, Charlton, & Leclair, 2019, p. 2). Analogously, the majority of Americans find it harder rather than easier to stay informed because of the countless news sources and information (Gallup/Knight Foundation, 2018a, p. 2). There is a global trend indicating that citizens even try to avoid news due to the "feeling of news overload" – in Canada the share of people who avoid news often, sometimes or occasionally is at 58% in 2019 (Brin et al., 2019, p. 8).

2.2.3.4   Audience fragmentation

Information overload is also influencing the readers' choice of the medium they want to rely on. Audience fragmentation, the division of audiences in splinter groups, already emerged in the 1970s and 1980s when the press was increasingly replaced by radio and television as main provider of information (OECD, 2010, p. 26). According to Pavlik, audience fragmentation is still following an upwards trend (2013, p. 182), favored by the existence and emergence of numerous information sources on the web. Although the audience as a whole has split into different groups, research shows that individual news consumers tend to stay with their "favorite" news source. Findings from the Reuters Digital News Report, for example, suggest that a decreasing share of Americans claim to use various news sources, both online and offline, in a week

(2018, p. 112). The researchers speak of an "audience fatigue". Taking into account this phenomenon, audience fragmentation is challenging for journalists and the society because it can also lead to a fragmentation of opinions. According to Sunstein, "it threatens to yield a tower of babble as strident voices swamp civil discourse and the mutual understanding that democracies depend on to survive" (Sunstein, 2007, as cited in Winseck, 2010, p. 377). Moreover, due to the erratic behavior of readers, it becomes more difficult for journalists to establish a kind of brand image.

2.2.3.5 Lack of a sustainable funding model

Dynamics in the structural setting of the media environment are only one side of the coin. A more fundamental and concrete challenge is the absence of a sustainable funding model, driven by the continuing loss of advertising revenues for traditional media.

Despite the "long-standing love-hate relationship between journalism and advertising" (Macnamara, 2014, p. 292), advertising is, together with the monetization of content, the "newspaper's chief revenue-getter" (Kesterton, 1967, p. 147), and even the "bedrock of the press" (McLuhan, 1964, p. 207). Indeed, advertising and journalism seem to be closely intertwined. In the eyes of McLuhan, the two industries complement each other by balancing good news (advertising) and bad news (journalism) (1964, p. 210). Or in the words of Kesterton: "As it appears in the newspaper it is itself a kind of news – news of the Canadian marketplace" (Kesterton, 1967, p. 147). Accordingly, Civil founder Matthew Iles is partially right when he says that "it's impossible to maintain a church-and-state divide between advertising and editorial" (Iles, 2016).

This old marriage of journalism and advertising seems now broken. With the advent of social media as a free alternative for accessing news, audiences have migrated to those sites. In order to make sure that they do not miss the profits of those crowded marketplaces, advertisers have followed suit. As a consequence, losses in advertising revenues are increasingly weakening the sustainability of media outlets. In Canada, they have nosedived by −8% for all media, −20.4% for newspapers, and −28% for magazines in 2016/2017 (Newman et al., 2019, p. 124). While net advertising revenues for all newspapers were at 3.43 billion Canadian dollars in 2008, this number has shrunk to 1.63 billion Canadian dollars in 2018 (News Media Canada, 2020).

In addition, the second source of income, monetization of content, proves to be difficult to realize. While The New York Times reportedly made $709 million from digital revenues and will be close to 10 million subscribers by 2025 (Newman et al., 2019, p. 118), it is a challenge to attract a solid customer base to small outlets who have less of a brand image and not enough of a financial buffer to be able to offer low subscription rates. In order to convince audiences to pay for content, it is not sufficient to argue that the process of content creation is expensive; the quality of the content might be the decisive motivation (Christensen et al., 2012, p. 12). Even then, journalists are confronted with the prevailing attitude among readers that information should be for free. Studies are showing that citizens are not even willing to pay the real value of essential goods like water (Macnamara, 2014, p. 292).

The erosion of the two main pillars of the news business model is maybe one of the most challenging developments in the journalism industry. Macnamara concludes that the absence of alternative financial strategies results from the fact that media companies did not invest in R&D in the last decade in order to prepare for structural changes since they underestimated the competition created by the Internet and instead

relied on their monopolistic or oligopolistic position (Macnamara, 2010, p. 23). This finding is consistent with Curran's behavioral pattern of "ostrich-like denial".

If traditional media want to keep pace with social media and win its audiences back, they have to shake off this attitude and test alternative revenue sources that go beyond advertising and classical subscription. As illustrated in the first chapter, each funding model has its individual shortcomings. Due to the fact that relying on one single funding source is likely to be insufficient in the highly competitive media environment, sustainable business models should be based on a "multi-dimensional revenue model" (Pavlik, 2013, p. 190). Regardless of the ultimate choice of revenue sources, Markides notes that business-model innovation is necessary when the traditional business model is obsolete or the organization is facing a crisis (2006, p. 22) – both conditions apply to the news industry.

2.2.3.6   Competition from social media

The business model has not completely vanished, however. Instead, social media as a competitor to traditional media has taken over the advertising model. With more sophisticated technological algorithms those platforms allow advertisers to target more precisely the appropriate consumer group.

But social media does not only represent a competitive threat with regard to advertising, they are also more and more replacing traditional journalism as a news source. For example, although the ratio of people who access online versus offline media to stay informed is balanced (in Canada: 56% use mainly offline news, 44% mainly online news), only 8% of those accessing online sources consult websites and apps of newspapers; in contrast, 63% claim to use social media to "find, read, watch,

share or discuss news" (Brin et al., 2019, pp. 8-9). This is alarming in view of the fact that Facebook & Co. do not create content themselves, but only aggregate it without any quality control and classification. Due to this "disproportionate power", technologies and platforms can determine the role of journalism, including "what it can do, who does it and how it is practiced" (Hermida & Young, 2019, pp. 68-69).

2.2.3.7   Citizen journalism

Indeed, Web 2.0 has enabled a more horizontal news creation process where the ability to tell and publish stories is not limited to professional journalists anymore. In 1995, the Ukrainian-American scholar Eugen Volokh imagined a media environment where "all ideas, not just the popular or well-funded ones, are accessible to all", allowing "rich and poor, popular and not, banal and avant garde" to "throw a hat into the ring" (1995, pp. 1806, 1807, 1823). This concept which Volokh called "cheap speech" has become true in the form of citizen journalism. With free web services and platforms, audiences are not passive readers or commentators anymore, but become themselves creators of it, for example by writing blogs, publishing videos or recording podcasts.

Due to the belief that the veracity of their content is sacrosanct (Macnamara, 2014, p. 282), journalists tended to ignore their audiences for a long time (2014, p. 293) and are still skeptical about the added value of a collaboration with the public, partially due to "journalistic arrogance" and "organizational blindness" (Erkkilä, 2019, p. 24). Therefore, citizen journalism is also a means for readers to express their sullenness towards the perceived paternalism of the press. This behavioral pattern is consistent with beliefs in the cultural studies discipline which assumes that citizens do not accept opinion-making from the top (Macnamara, 2014, p. 80). Hence, journalists

have no longer the sole legitimacy of disseminating information to a greater public. Instead, citizen journalists form the Internet according to their needs: they create spheres where they are able to share views beyond the conventional media coverage.

The competition through untrained authors could represent a further threat to professional journalism. Even if in a healthy democracy, citizens should be given the possibility to express themselves, it is highly questionable if contributions from citizens qualify as journalism. The low barriers of creating stories and the access to technological tools enabling to diffuse them has triggered a debate about "how to identify what is and isn't journalism" (Hermida & Young, 2019, p. 44). Citizen journalism tends to be discredited as "often highly subjective opinion or polemic" (Macnamara, 2014, p. 269) and is criticized for devaluing standards of accuracy and credibility (2014, p. 280). The tensions between traditional journalism and citizen journalism are intensified by the resulting loss of traditional gatekeepers. Whereas in traditional journalism, editors and specialists in legal departments are in charge of fact checking and compliance of content, the "P2P heuristic" (peer-to-peer heuristic) of the Web 2.0 shifts this responsibility to apomediaries, i.e., to Internet users who mutually control each other's content in order to establish credibility (2014, pp. 268, 288-290).

2.2.3.8   Copyright issues

Furthermore, it is a common practice in citizen journalism to simply copy content from professional journalists without conducting their own investigations (OECD, 2010, p. 100). This calls into question the added value of this new form of reporting. Issues related to copyright are another essential challenge for the journalism industry because infringements are a hardly controllable issue on the Internet. Concerns about

the possibility to manipulate images were already raised when VDTs were equipped with the ability to process photos (Mari, 2019, pp. 69-70). Today, there exists a "mismatch between current IP law and the Web" (De Filippi et al., 2016, p. 1), since the knowledge economy and digitization shift commerce from physical goods to digital assets.

2.2.3.9 Fake news

The tide from scarcity to plenitude has given rise to a new information factory where everybody can write, copy, invent, modify and publish stories at a minimal cost without any fact-checking mechanisms. In view of the popularity of social media, the loss of gatekeepers, the rise of citizen journalism and insufficient protection of IP, it is indispensable to introduce the notion of "fake news", a term that is "both poorly defined and highly politicised" (Newman et al., 2018, p. 19). Basically, this concept has two dimensions: it can comprise "[...] false information purporting to be journalism and the denunciation of bona fide journalism as potentially false" (Whittaker, 2019, pp. 72-73).

The German sociologist Dirk Baecker emphasizes that the driving force of fake news is not the individual, but the collective belief in them (Baecker, 2018, as cited in Aguigah, 2018). This is by no means a new phenomenon. In 1997, Robert W. McChesney observed the tendency that an information becomes true for the public if someone is capable of making people believe that it is true, thereby undermining the intrinsic value of truth (Chomsky & McChesney, 2004, p. 164). What is new, however, is that by means of algorithms fed with customer traces on the web and favored by the audience migration to social networks, technology facilitates the

spread of such misinformation to a critical mass. Baecker adds that the complexity of the modern world is often used as a pretext to believe in fake news.

While fake news were "originally referred to fraudsters peddling completely false but often emotionally charged stories in the hope it would "go viral" on social media so they could earn ad money from the web traffic back to their site" (Civil, 2017c), the term is today rather associated with political ambitions to invalidate inconvenient facts in the own interest, especially since the presidential elections in the United States in 2016. Smear campaigns of politicians against traditional media (Newman et al., 2018, p. 10), have resulted in toxic, polarized discourses and uncertainty in society.

The penetration of fake news in the media landscape becomes clear when looking at results from the Digital News Report, revealing that citizens in numerous examined countries (among them 61% of all interviewed Canadians) are uncertain about which information is real and which one is fake (Newman et al., 2019, p. 22). In 2018, study participants are particularly concerned about news reporting for political or commercial reasons as well as biased journalism, i.e., misleading headlines or factual mistakes (Newman et al., 2018, p. 20). A survey conducted by the Gallup/Knight Foundation shows that 73% of Americans think that fake news is a serious threat to the news media (Gallup/Knight Foundation, 2018a, p. 2). Findings from the World Economic Forum confirm this fear on a global level: "media echo chambers and fake news" rank 8th among short-term risks (2019, p. 12). However, according to Reuters' findings, there is a big mismatch between the concern of being exposed to fake news, and the real level of exposure (Newman et al., 2018, p. 20).

The co-existence of different versions of a story has triggered a debate about truth and objectivity in journalism. According to the poststructuralist school of thought,

truth is not singular (Macnamara, 2014, p. 282), but depends on individual interpretations. This can "challenge some of the hegemonic practices of objectivity" (Salamon, King, Crowther, & Thibault, 2016, p. 274) typically deployed in occidental journalism which proposes that the veracity of information is legitimized through the provision of facts, giving established media their exceptional position as "vessels of truthful information" (Wahl-Jorgensen, 2014, pp. 267-268). The necessity, however, to reflect diverse viewpoints was already acknowledged by McLuhan back in 1964: demanding the press to be uniform would be like "demand[ing] that department stores have only one department" (1964, p. 207). Nevertheless, there is quite obviously a difference between natural news diversity and fake news. Although fake news are mostly created and diffused by highly partisan parties, 75% of citizens plead that media companies should mitigate the problem, compared to 71% and 61% who think this is the responsibility of tech giants and governments, respectively, according to the Reuters Digital News Report 2018 (Newman et al., 2018, p. 41).

2.2.3.10 Loss of trust

Based on the finding that "public opinion can be intentionally distorted by exploiting information overload and confirmation bias, with significant political, social and economic consequences" (World Economic Forum, 2017, p. 25), uncertainty about what is fact and what is fiction are the cause of a loss of trust, "the most vital intangible asset journalism has" (Pavlik, 2013, p. 190). Findings from the Gallup/Knight Foundation provide evidence that fake news, biased and unbalanced or one-sided reporting are reasons why audiences in the United States do not trust the media (Gallup/Knight Foundation, 2018b, pp. 8-9).

There is an historical heuristic of mistrusting the conventional news industry. Since its rise to a mass medium, the press has been facing reproaches to abuse its exceptional position. Instrumentalized and partisan journalism in the 19th century raised concerns among readers if the press is concealing the truth, leading to mistrust and deprecation. Although journalists are nowadays trained with regards to the avoidance of biases, the sullenness among readers towards the news industry continues to increase (Macnamara, 2014, pp. 284-287). In this regard, it is important to mention that the causes and effects of distrust and media sullenness are not entirely clear: people might refuse to consume the mainstream media because they mistrust them, or they might mistrust them because they do not consume them (Gallup/Knight Foundation, 2018b, p. 6).

Therefore, possible reasons for trust or mistrust should be taken into account. According to the Gallup study, the three most important factors in determining whether or not to trust in a news organization are a media's commitment to accuracy, its responsiveness to mistakes as well as its commitment to fairness (i.e., if it discusses all sides of an issue), and the media's record of inaccurate and false information published in the past (2018b, p. 14). In the United States, the future outlook of the trust level seems especially dark: 31% of Americans think trust cannot be restored, according to Gallup (2018b, pp. 1, 5), indicating that media might have irreversibly lost parts of their gatekeeping role.

The situation is less critical in Canada. 52% (2018: 58%) of Canadians trust news overall (US: 34% in 2018 and 32% in 2019; France: 35% in 2018 and 24% in 2019) and rank thus 5th out of 38 countries, but only 20% have trust in social media (US and France: 14%) (Newman et al., 2018, pp. 79, 113, 119; Newman et al., 2019, pp. 85, 119, 125). The Reuters Digital News Report 2019 reveals that the three most trusted brands in French-speaking Canada are ICI Radio Canada, TVA Nouvelles and

La Presse; Anglophones trust CTV News, CBC News, and Global News the most (Newman et al., 2019, p. 125). A survey conducted in 2019 by the CEM adds to this picture the finding that trust in Quebec media is exceptionally high, particularly in La Presse, Le Devoir, Radio Canada as well as RDI (Langlois, Sauvageau, & Proulx, 2019).

2.2.3.11 Social polarization

Nonetheless, the shrinking confidence among audiences on the national level (58% to 52% from 2018 to 2019, see previous paragraph) and the international level is a development that journalists cannot ignore. A balanced relationship between journalists and their audiences is the pre-condition for a functioning media environment, and even for a healthy democracy since news allows citizens to stay informed, and to participate in political life (Chomsky & McChesney, 2004, pp. 101-102).

The current challenges of the journalism industry have resulted in polarizing discourse about the role of journalism. Especially the distinction between fact and fiction has become subject of discussions on the civilian as well as on the political level. Volokh already warned in 1995 that "more diversity of sources might mean less common ground and less social cohesion" (1995, p. 1836). More diversity of sources also means that one can choose the source he wants to believe. A report from the World Economic Forum notes that such "echo chambers" on the web "reinforce rather than challenge people's existing biases" (World Economic Forum, 2017, p. 24). In addition, despite the horizontal process of news creation, citizens might still feel journalists' superiority. The downside of cheap speech − indicated in the ambiguous meaning of cheap − is that "the power to make one's speech globally

available isn't the power to make it globally heard" (Volokh, 1995, p. 1833). Last but not least, economic decisions like the introduction of paywalls create a "two-tier system" where the quality of accessible content is determined by the individual financial situation of the reader (Newman et al., 2018, p. 23).

As a result, society is divided into two "categories" which researchers from Gallup and the Knight Foundation call "Knowledgeable Optimists" and "Inattentive Skeptics" (Gallup/Knight Foundation, 2018a, p. 2). While knowledgeable optimists are well informed and are confident that the truth exists, inattentive skeptics are less informed and do not believe in the existence of the truth. Such a social divide might be able to undermine democratic principles. Journalism scholar James W. Carey puts great emphasis on the role of the triangle of journalism, democracy and the public for the process of creation and existence of modern journalism (2007, pp. 8-13). Originally, the public represented a group of people with very different social and economic backgrounds who gathered in public places to discuss about the news; first with a focus on art, later driven by political topics. During this period (18th century), journalism had not yet assumed its educational and supervisory role but found its raison d'être in nourishing public debate by providing relevant content. It is this initial function of serving the public that the "value of journalism" has been built on, implying that journalists' ultimate vocation is to preserve democratic structures. Journalism and democracy are interdependent; neither can exist without the other. In this interplay, the nexus of the relationship between journalism and the public is the "passion for democracy".

Bearing in mind these reflections, the current challenges of the journalism industry are not only grounded on economic and political realities, but also have a significant social dimension, and are further reinforced by the digital era. Figure 2.6 depicts the most important challenges and disruptions presented in this section.

Figure 2.6   Historical disruptions and current challenges of the journalism industry

Both locally and globally, finding a persistent solution which is suitable to address not only already existing challenges created by online competition but also future trends is important in order to make the news industry survive the era of digitalization (Hernandez Serrano, Greenhill, & Graham, 2015, pp. 314, 315, 322). However, as shown in the first chapter, no sustainable approach, especially no technological approach, has been found so far to address the "crisis" of journalism. So far, blockchain technologies are not yet considered as a disruptive alternative in the journalism world. This might be due to the fact that their potential benefits for the news industry are not well-known. Therefore, and from the perspective that

journalism will have to face a "paradigm shift in practices and culture" (Macnamara, 2014, p. 298), we outline the promises of blockchain technologies for the news industry in the next section, and explain how they could be embedded in the journalism business model as well as in work practices.

2.3 Applications of blockchain technologies in the journalism industry

With the technical basics of blockchain networks as well as the historical background of traditional journalism in mind, both disciplines can be linked in a next step. By comparing currently most striking challenges for the news industry with the blockchain's most crucial characteristics, some overlaps become apparent, indicating a potential of the technologies for journalism. This section maps possible applications of blockchain technologies in the journalism industry and briefly explains to which extent they could contribute to new forms of content creation, dissemination and sharing.

2.3.1 Permanent archiving

The most evident promise of blockchain networks in journalism is permanent archiving. Since journalism at its very core is "the record we share in common" (Carey, 2007, p. 4), the tamper-proof storage of blockchain networks offers the possibility to preserve information in a secure manner and without time limit. The distributed database allows every node to verify past publications, making it impossible for a content creator to deny statements or details of reporting. At the same time, this offers journalists a "proof of publication" as well as a censorship-resistant mechanism to publish articles (Al-Saqaf & Edwardsson, 2020, p. 101).

What is more, every time journalists want to make modifications to a story, they have to upload the new version completely. As different versions of a story can then be compared, readers enjoy higher levels of transparency – a core value of journalism. According to a Gallup study, transparency is among the top reasons for trust, together with accuracy and bias (Gallup/Knight Foundation, 2018b, p. 13).

The blockchain could even become a global news archive (Future Today Institute, 2019, p. 50). Newspapers could move their old stories from centralized data bases to the distributed ledger in order to ensure their accessibility and persistence in the future. In addition, if more and more journalists publish their work on the blockchain network, it will host important amounts of information which can be retrieved for future investigations.

The immutable nature of blockchains might furthermore have a rather psychological effect. Given the fact that any transaction processed by the blockchain network is irrevocably saved and can always be traced back, journalists might work with even greater prudence with regard to accuracy and fact-checking. If blockchain networks are to be implemented at a large scale in the future, every journalist or newspaper not storing their articles on the blockchain could be branded as less credible. Taking this idea even further, fake news could be identified more easily: their authors are either exposed to criticism and discredited because they put misinformation on the blockchain, or they are devalued because they circumvent blockchain-based news platforms. The flipside of the coin is that due to the immutable character of blockchain networks, false information cannot be removed from the transaction history – an illustrative example of the "garbage in, garbage out" problem.

On the other hand, it is not yet clear if credible journalists would accept such a control mechanism either, especially within a public ledger where information is

disclosed without restrictions. The Future Today Institute estimates that immutable ledgers are likely to fail in changing people's attitude towards information and access to it, and instead trigger a discourse about their politics (2019, p. 59).

2.3.2 Copyright and data protection

Robust archiving can also contribute to the improvement of data protection and ownership management. It allows for a clearer *attribution* – the unambiguous matching of owner and ownership (O'Dair, 2019, p. 32). Due to cryptography, digital signatures and timestamps, the *provenance* of an article can be identified, while journalistic content in itself is protected by the impediment for document alteration. An even more powerful method to protect ownership from a legal point of view represents the tokenization of content. In the digital age where it is simple and nowadays common practice to copy files and documents, distributed ledgers make it possible to create *digital scarcity*, two terms that might seem contradictory at first sight (Ragnedda & Destefanis, 2020, p. 2). Tokenization is built on this idea: by assigning fix values to digital objects, they become unique and non-fungible (i.e., not easily exchangeable) collectibles (O'Dair, 2019, p. 48). Consequently, even if it is possible to copy an article, there exists only one original (De Filippi, 2018, pp. 85-86). More concretely, this means that even if copyright infringements are still possible outside the blockchain, the original author of the article can prove the provenance and the publishing date of the article.

Apart from this, O'Dair points out that the decentralized registration of ownership and copyright on the blockchain would provide a more transparent and less opaque rights database, facilitating the correct use of somebody else's property (2019, p. 39). Decentralization then shifts the responsibility for data protection from media

companies to the whole blockchain network. Nevertheless, critics argue that the efficiency of IP management on a blockchain network heavily depends on network effects, i.e., the power, size and reach of the network (Savelyev, 2018, p. 558). Moreover, such models for IP management might not be compatible with existing legal frameworks (2018, p. 551). For example, the immutability in blockchain networks becomes problematic if a digital asset is the result of the collaboration of several persons and might continue to evolve (2018, p. 557).

2.3.3 Identity management

In accordance with the promise of data protection, blockchain technologies allow to create a system of self-sovereign identities (Future Today Institute, 2019, p. 60). This could have several advantages. First, in more advanced stages of blockchain projects in the news industry, a journalist's ID could become the flagship of his reputation. By tying the ID to reputational credits attributed by readers and other journalists, they may be incentivized to produce high-quality stories. Producers of fake news would probably be rated negatively, excluding them from the wider journalistic community. Hence, identities could be a way to re-establish the "brand image" of journalists and media outlets, and possibly to address the ongoing audience fragmentation. Particularly for freelancers or small outlets, this could represent an approach to create a counterbalance to media conglomerates.

Furthermore, certificates, diplomas or other records could be issued to professional journalists in order to distinguish them from citizen journalists. These credentials, stored in identity hubs, would refer to the journalist's ID in order to enable readers to verify his professional record when they are reading one of his articles. Civil is

exploring ways to implement those theoretical concepts; we explain them in the next sections.

In addition, as explained earlier, a principal advantage of self-sovereign identities for audiences is that they would regain control over their personal data (2019, p. 60). Readers will have the power to decide how their data is monetized, for instance with regard to advertising. One example is the so-called Brave Browser which lets users choose which advertisements they want to see, and subsequently rewards them for it.

2.3.4   Alternative funding models

In addition to a new advertising model enabled by self-sovereign identity, media companies could develop novel approaches for a sustainable funding model by means of cryptocurrencies.

2.3.4.1   Micropayments

The great advantage of cryptocurrencies is their granularity, i.e., the possibility to split a token into much smaller fractions than fiat currencies. For readers, this means that they can support various media outlets and journalism projects at the same time without spending a large amount of money, while journalists could benefit from a larger pool of subscribers and donors. The concept of so-called micropayments is not a new one; it has become a common practice in the music industry, and could be a promising opportunity for journalism. The American journalistic non-profit organization ProPublica, for example, was able to increase its revenues by 50% due to small, fractional donations (Newman et al., 2018, p. 112).

Content payment based on a "per-use" model – i.e., readers pay for each single article they read – rather than on a flat rate model is supposed to increase readers' willingness to pay for information (Sallaba et al., 2017, pp. 11-12). In contrast to the traditional model obliging readers to pay a blanket, time-dependent subscription, the idea of micropayments is to link the payable amount to the real volume of articles accessed. Consequently, each single reader only pays a fraction of the full price, whereas the collective payments lead to a fair valorization of the journalist's work.

Micropayments can also be performed as a form of tips to the content creator, which is called "tip jar" model (De Filippi et al., 2016, p. 17). This means that readers are able to support their favorite journalist or media outlet with small one-off payments. Moreover, blockchain-based crowdfunding tools could allow journalists to propose a specific project in advance and then to collect the necessary amount of money from his community (2016, pp. 17-18). Such a model is being developed by Civil, which we present in section 2.4.

2.3.4.2 Additional concepts

The idea of micropayments enabled by cryptocurrencies can be complemented by more advanced, dynamic concepts whose viability has yet to be tested. For example, journalists could be remunerated for outstanding articles based on an audience rating. In turn, readers will be rewarded for providing good comments, or recommendations for future articles. A further option could be a model where readers can decrease their subscription fee by increasing their news consumption (Future Today Institute, 2019, p. 53). This might, on the one hand, motivate journalists to produce high-quality stories, and, on the other hand, incentivize audiences to engage more in the news creation process.

2.3.5 Automation through smart contracts

Given that micropayments could result in a large number of transactions that need to be processed, they could be managed through smart contracts. Each time a reader clicks on an article, the micropayment could be automatically completed – provided that the reader has authorized this procedure. Other contracts between journalists and readers are conceivable, for example with regard to crowdfunding tools. If the journalist does not achieve the objectives of his project, the collected funds will be returned to the donors (O'Dair, 2019, p. 51).

Smart contracts could also be used for framing agreements between newspapers and their business partners, for example photographers or news agencies. Whenever several actors are involved in a journalistic project, the smart contract would specify the terms for all of them. Once a party has delivered her contribution, she will get paid automatically according to the pre-defined conditions.

Moreover, content procurement, licensing as well as royalty payments could be managed in an automated fashion (2019, pp. 31, 40). By reducing the need for human interaction and facilitating the definition of business rules, smart contracts offer "low-friction ways" to manage IP-related issues (Future Today Institute, 2019, p. 55). As a consequence, they could be a simplified way to solidify data protection and prevent copyright infringements.

2.3.6 Disintermediation

In addition, "decentralized curation" (Future Today Institute, 2019, p. 66) mechanisms consisting of automated contracts as well as novel crypto-economic

funding models favor the process of disintermediation. In the news industry, intermediaries are "those who are positioned between journalists and readers in such a way that give those intermediaries direct or indirect influence on editorial decisions" (Al-Saqaf & Edwardsson, 2020, p. 97), i.e., for example media owners, gatekeepers, businesses and even politicians.

Smart contracts can eliminate the need for the supervision of transactions. This is especially true for the distribution and transfer of remuneration as well as royalty payments which do not have to be managed and controlled by a third party any more. This also means that the final amount for the recipients increases, since no intermediary takes a share for his services (O'Dair, 2019, pp. 39, 41), thus decreasing transaction costs (De Filippi et al., 2016, p. 17). With the absence of payment services like PayPal where transaction fees can exceed small payment amounts, micropayments become profitable for both readers and journalists. From an organizational point of view, disintermediation in the journalism industry could help to establish greater self-governance of journalists (Civil, 2018c) and platforms (Future Today Institute, 2019, p. 66).

2.3.7 Restoring trust

If blockchain-based news platforms and their technical features can really contribute to the realization of the above listed promises, it might be possible to restore parts of the lost confidence among audiences. The decentralized, consensus-based, tamper-proof and time-stamped character of blockchain networks builds the basis for a reliable and transparent system. Based on these principles, blockchain technologies raise expectations about the ability to establish a system in which all involved parties trust each other (Hawlitschek et al., 2018, p. 57). Furthermore, self-

sovereignty with regard to personal data, the elimination of intermediaries and the increased involvement of audiences in the news creation process might be additional driving forces for trust building among readers. An increased integration of readers and improved trust levels could maybe even mitigate the problem of social polarization.

With regard to audience engagement, blockchain in journalism can be related to a concept referred to as *social era* by Hernandez Serrano et al. (2015). This notion comprises a "set of fast, fluid flexible networks of connected individuals creating connected businesses and connected supply chains/industries that are being advanced by social technologies" (Merchant, 2012, as cited in Hernandez Serrano et al., 2015, p. 313). An essential characteristic of this novel economic structure is the high participation of the consumer in the value creation process and its interaction with businesses, thus replacing the notion of *attention* by *trust* (2015, pp. 314, 320). However, it is important to note that although readers could become kind of shareholders and "guards" of the media, journalists would continue to be in charge of content creation and editing.

The re-establishment of trust could be fueled by future prospects like the possibility to enable real-time fact checking on the blockchain (Future Today Institute, 2019, p. 50). Nonetheless, such tools and methods have yet to be developed. Furthermore, it is crucial to understand that blockchain technologies cannot completely replace and erase the social construct of trust within a network of multiple participants. In addition, as illustrated by De Filippi's and Wright's explanation in the previous section, a special form of trust in the underlying technological paradigms is needed, too. Especially for small media outlets, it will be challenging to attract audiences to news platforms based on blockchain (2019, p. 56).

To put it in a nutshell, the major promises of blockchain technologies on the journalism industry are permanent archiving; an optimized data protection to support the rights of content creators; identity management; novel funding models by means of micropayments; automation of business processes; disintermediation and the re-establishment of trust. Although blockchain-based news platforms may not address economic issues like the concentration of media ownership, disaggregation and convergence directly, they can offer smaller news outlets, individual journalists and audiences an alternative journalism marketplace with practical tools to overcome recent challenges. If the network effects of blockchain networks are really to materialize, more journalists and citizens might become interested in the project, thus helping their stories to gain in impact and reach.

After having outlined the general applications of blockchain technologies in journalism, we present in the next section the case of Civil, including its ecosystem, cryptocurrency and tools.

2.4 The case of Civil in New York

In order to understand the potential of blockchain technologies in journalism, we present in this section the case of the start-up Civil from New York by giving an overview about Civil as a company, its ecosystem and its tools. The Civil team itself is constantly publishing a wide range of articles about their business, notably on the news platform Medium. But also other media websites turn the spotlight on Civil – mirroring "muted excitement, bewilderment, and outright dismissal" (Bilton, 2017).

The New-York-based start-up has developed a publishing platform which is linked to the public Ethereum blockchain and which offers journalists and newsrooms the

opportunity to explore an alternative or complementary business approach, and to benefit from a toolkit of different functionalities enabled through blockchain technologies. The company was already founded in November 2016 by CEO Matthew Iles and started publishing first articles in 2017. One year later, Civil launched its website and published a white paper. The major promises of the blockchain-based Civil platform that are listed in the white paper are improved transparency and autonomy, reinforced trust between readers and journalists, renewed appreciation for directly supported journalism, protection of intellectual property, permanent recording of authorship and content, the creation of a self-governance model as well as quality assurance through economic rewards (Civil, 2018c).

By transforming these promises into concrete tools, Civil aims to introduce a "radically new operating paradigm" (Civil, 2017c) for the journalism industry. Especially the self-governance model which allows journalists and readers who possess Civil's cryptocurrency to "challenge" allegedly unethical newsrooms is meant to transfigure journalism into a "participative system of journalists and citizens trading in accurate information and civil discourse" (Iles, 2018d). The model is based on the principle that "the community [...] is economically incentivized to curate for quality" (Vuong, 2018) of the content published on the Civil platform. With these reflections in mind, Iles described the vision of its company in September 2018 as follows: "Civil dreams to be a network of newsrooms committed to ethical journalism held accountable by everyday citizens and the independent journalists who serve them" (Webb, 2018). He explains that the "twin crisis of sustainability and trust" in modern journalism was his team's motivation to develop a valuable alternative to publish news. In July 2019, Civil introduced the notion of trust in its mission by specifying that Civil wants "[...] to become the world's most trustworthy media platform [...]" (Iles, 2019c). The start-up addresses notably local, international, policy

and investigative journalism as these columns have been "hardest hit" by the journalism crisis (Civil, 2017c) .

In the two years before the official launch of the Civil platform and the ICO in 2018, details of the project had evolved in a range of blog posts, publications, shared documents and open source code, interviews and conferences. Given the publicly available record of Civil's development, the project can be characterized as a typically open blockchain model as defined by Park et al. (see section 2.1.3).

However, although Civil has developed its own cryptocurrency CVL (see section 2.4.2), the start-up has not yet completely decentralized their database as it can be the case in early blockchain projects. The algorithmic structure of CVL, Civil's smart contracts as well as the code of the Civil platform are derived from the standards of the Ethereum code, and all transactions to be registered immutably are sent to, processed by and stored on the Ethereum network. This also means that the nodes creating the blocks are participants of the global Ethereum network − members of the Civil community are hence not involved in the block creation process unless they choose to join the network of Ethereum nodes. To summarize, what is referred to as "the blockchain" in this section points to the public Ethereum blockchain.

This section will not take into account initial ideas and drafts, but will concentrate on the as-is of the project. The section is structured as follows: First, we describe the Civil's ecosystem and its entities. Second, we explain Civil's cryptocurrency CVL as well as its design and function. Third, the tools and functionalities of the Civil platform will be presented.

2.4.1 Civil ecosystem

Civil consists of different entities which together build an ecosystem that is supposed to ensure the realization of the company's major goals (Civil, 2018c):

- *The Civil Media Company*. For-profit organization having initiated the Civil project;
- *Civil Constitution*. Framework containing ethical guidelines which the newsrooms have to respect;
- *Civil Foundation.* Independent, non-profit organization supporting newsrooms and promoting the core values of the Civil Constitution;
- *Civil Council*. A group of journalism experts responsible for the correct implementation of the Civil Constitution with voting power in the self-governance system;
- *Civil Registry*. Pool of approved newsrooms curated and governed by the Civil community;
- *Civil Studios*. Company investing in pilot projects involving journalism and blockchain;
- *Civil Labs*. Responsible for software development.

The next section describes each entity more in detail.

2.4.1.1 Civil Constitution

Mirroring the "social construct" Civil (Civil, 2018a), the Civil Constitution is the "framework for defining what does − and does not − constitute ethical journalism on

Civil" (Civil, 2018c). It has been co-written by more than 50 journalists, academics, lawyers, cryptoeconomic experts and Civil (Civil, 2018d). The so-called "Beta Constitution" was published on May 4, 2018; the "Inaugural Constitution" on December 19, 2018. The final Constitution is supposed to be ratified in 2020. At the moment, however, the Constitution is open for suggestions from the Civil community and deliberately left incomplete; Civil describes the Constitution as a "living document" and a "aspirational document" that is designed as a "floor" rather than a "ceiling", meaning that it only contains the minimal requirements for quality journalism. Newsrooms should not be obliged to "tick every box" of the Constitution terms (interview J94). The Constitution consequently includes basic journalistic standards which every newsroom on Civil should obey, like accuracy, transparency, independence, accountability, respect, no discrimination, no plagiarism, and protection of personal user data. Despite these guidelines, the Constitution lacks an explanation how different national standards, especially those violating the freedom of the press, will be addressed. The wording remains very vague by stating that "efforts will be made to allow such Newsrooms to flourish on the Civil Platform". In view of the diverse community, Civil plans a Spanish version of the Constitution (interview M30).

2.4.1.2 Civil Foundation

The Civil Foundation is the only charitable entity of Civil, led by former NBC News vice president and NYTimes.com manager Vivian Schiller. It consists of experienced journalists and entrepreneurs from media-related businesses who collaborate with like-minded organizations all around the globe. The overall mission of the Foundation is to "uphold the values of Civil", i.e., "long term sustainability and growth of a global network" (Schiller, 2018a).

More concretely, four areas of activity of the Foundation can be distinguished (Civil, 2019c): First, the Foundation aims to support journalism by providing grants to news organizations, especially to innovative technology projects and open-source solutions, and to newsrooms in order to "help them get off the ground" (interview J94). With regard to grant making, the Foundation aims to create promising partnerships with other organizations like the Pulitzer Center or the Tow Foundation (Schiller, 2018a). Readers and community members have the possibility to support the Foundation directly by transferring funds with a credit card (Civil, 2019g). Second, its members are responsible for the permanent evolution of the Constitution. They alter, adjust and complete the Civil Constitution by collecting feedback and recommendations from the community as well as the public. Third, the Civil Foundation helps newsrooms to build a sustainable relationship with their readership by providing them with the necessary tools, for example concerning analytics, crowdfunding, or CRM. A free pool of relevant services is being built for community members. Fourth, newsrooms should be able to develop their competencies through "educational programming". The Foundation offers webinars, articles, white papers, meetings and research in order to impart technological know-how as well as editorial skills.

In addition to these four tasks, the Foundation is in charge of the recruitment of newsrooms, hence presenting the Civil project to journalists all around the world. The Foundation aims to promote journalism especially in regions where news coverage is scarce (Schiller, 2018c).

2.4.1.3 Civil Council

The Civil Council, initially called Journalism Advisory Board (Civil, 2017b), is a group of approximately 15 people with expertise in journalism, academia or free-

speech who have an advisory role with regard to the Civil Constitution (Schiller, 2018b). The Council's principle role is to create a professional counterbalance in the Civil self-governance process. It steps in whenever a single member does not accept a community decision about a specific challenge, and lodges an appeal (for more details, see section "Civil's tools"). As of 2020, Civil wants to shift to complete "Community Governance" which includes a stepwise withdrawal of the Council. In case of the failure to ratify the Civil Constitution within two years, the Council will be dissolved and its members replaced by the Civil Foundation, until new Council members will be appointed.

2.4.1.4   Civil Registry

The Civil Registry is the "whitelist" (Civil, 2018c) of all newsrooms that have applied to the Civil network. Any newsroom being involved or having been involved in the Civil project is listed in the Registry (applying newsrooms, approved newsrooms, challenged newsrooms, rejected newsrooms). Since the Registry is maintained and updated by Civil community members who possess Civil's cryptocurrency CVL, it is defined as a "token-curated registry", or TCR.

Both single journalists and group of journalists can apply for becoming a newsroom on the Civil Registry (Civil, 2018a). The application process includes four steps (Civil, 2018a, 2018c). First of all, the applicant has to submit a mission including the purpose, the intended community, ownership structure, funding sources as well as the business model of the planned newsroom. In addition, a roster with all involved persons and their references has to be provided. Thereafter, the Civil Constitution must be signed in order to confirm that the newsroom will respect its principles. Last but not least, the applicant has to stake tokens (in Civil's cryptocurrency CVL) in

order to activate his application (see section "Civil's cryptocurrency"). He must deposit 5,000 CVL plus about $10 of transaction fees. Any applicant for the Civil Registry can apply for a token grant from the Civil Foundation which covers the fee of 5,000 CVL. Once the application is submitted, the Registry contains all relevant information about the newsroom, summarized in the so-called charter. It includes the newsroom's mission, team, ownership structure, current or intended revenue sources, and potential conflicts of interest. In addition, the listing history of the newsroom is displayed publicly on the Registry, i.e., the dates of its application and approval as well as all challenges, appeals and, if applicable, its rejection. Given that rejected newsrooms are retained in the Civil Registry, journalists should verify carefully if they respect the guidelines of the Civil Constitution before submitting an application. Being listed as a refused newsroom might damage reputation and credibility. However, once a rejected newsroom has entirely adapted to the Constitution, it can re-apply to the Registry (Schiller, 2019a).

2.4.1.5   Newsrooms

The Constitution describes journalism as "the activities involved in an independent pursuit of accurate information about recent or current events. It can take many forms including audio, video, illustration, photography, data visualizations, animation and text; "straight" news reporting, features reporting, long-form narrative journalism, opinion writing, advocacy journalism and personal essays" (Civil, 2018a).

When Civil launched its Registry in June 2018, already eleven newsrooms had been whitelisted (Civil, 2018e): three for local journalism (Block Club Chicago, The River, FAQ NYC), three for investigative journalism (Sludge, Documented, ZigZag), three for policy journalism (Cannabis Wire, Hmm Daily, The Small Bow), and two for

international journalism (Popula, Global Ground). These early adopters are also called "First Fleet Newsrooms" (Vuong, 2018). All of these companies rejoined Civil after the launch of the second token sale, and are still active on the Civil network. The very first news outlet that confirmed to experiment with Civil was Popula (Bilton, 2017), a publication founded by journalist Maria Bustillos who is also writing for The New Yorker and the Columbia Journalism Review, among others.

In its beginnings, Civil gave $1 million in grants to more than 100 journalists across 15 newsrooms to fuel its platform (Civil, 2018c) and to ensure that it already includes some high-quality newsrooms before the official launch. The concerned newsrooms applied for grant between fall and winter 2017 and employ journalists from big players like The Wall Street Journal, The New Yorker, TIME Magazine or The Denver Post (Civil, 2018d). While Civil had ten newsrooms in March 2019, there were already 37 newsrooms at the end of May 2019, and over 70 in November 2019. Among them are foremost small newsmakers publishing solely online, but also online magazines with prominent roots, such as The Colorado Sun, an offspring of the newspaper The Denver Post. A vast majority of 60% are located in the United States (Iles, 2018b), but Civil also attracts journalists in South America, Africa and Europe. Civil's goal is to establish a pool of 1,000 small and midsize newsrooms around the globe by 2020 (Iles, 2018e).

Civil points out that all newsrooms remain independent entities which are entirely autonomous and responsible for their business activities, decisions and revenue models (also including advertising and sponsoring). Most of them are not charging for all of their articles, but are rather offering a combination of paid content (via memberships or subscriptions) and free articles. Civil emphasizes that it never takes a direct cut of transactions between newsrooms and their audience (Civil, 2019g), and

that it has no control over newsroom operations. The only obligation for newsrooms is to sign the Civil Constitution (interview J94).

2.4.1.6 ConsenSys

Apart from the internal entities of the Civil ecosystem, Civil also has external partnerships. Civil's most important partner and parent company is the blockchain incubator ConsenSys which provided the start-up with an investment of $5 million in autumn 2017 (Civil, 2017a). The company was founded in 2015 by the Canadian entrepreneur Joseph Lubin who is also a co-founder of Ethereum. ConsenSys Labs, the company's venture production studio, is incubating more than 50 blockchain-related projects, making ConsenSys "the Google of blockchain tech" (Matsakis, 2018). Civil will be financed by ConsenSys until the Civil business is mature enough to make significant profits from its commercial activity (Iles, 2018a).

2.4.1.7 Partnerships and collaborations

Furthermore, Civil collaborates with different companies and institutions in order to increase the reach of its project, and test its tools in a real business context. For example, Civil has been establishing partnerships with key players in the journalism industry. In August 2018, Civil announced a collaboration with the Associated Press (Coolidge, 2018; Moses, 2018) with regard to licensing. By licensing content to the Civil newsrooms, the partnership is expected to facilitate access to new clients for the AP. In addition, the two businesses plan to work on a new Civil tool that allows newsrooms to track their content in order to better detect unauthorized republishing and copying.

Shortly after the announcement of the AP collaboration, Forbes reported to experiment with the Civil platform in 2019 (Forbes, 2018). Partnerships with Journalism Universities (USC Annenberg, Arizona State University) and Journalism Institutes (European Journalism Centre, International Center for Journalists, Reynolds Journalism Institute) are also part of the broader Civil ecosystem. On the other hand, big players like the Dow Jones, the New York Times, and the Washington Post refused to collaborate with Civil (De Silva, 2018).

2.4.1.8 Civil Labs and Civil Studios

In addition to those partnerships, Civil is looking for ways to complement and eventually replace financial support by ConsenSys. Therefore, Civil had created the entities Civil Studios and Civil Labs as potential "money-making arms" (Owen, 2018a). These two entities were part of a larger funding model elaborated in April 2018 (Iles, 2018d). Civil Studios was supposed to realize podcasts and documentaries about journalism "à la "Netflix Originals"", whereas Civil Labs should represent the R&D department of Civil by focusing on software development and the creation of a Civil "app store".

In our interviews, however, Civil admitted that it is revising the role and value added of both funding sources which currently are only "concepts" (interview S51). Instead, Civil wants to generate recurring revenues through the sale of software and services to media organizations, especially related to licensing and advertising, as well as through audience direct contributions to the Civil Foundation.

2.4.1.9 Civil community

Although not listed in the Civil Whitepaper, the Civil community is another crucial component of the Civil ecosystem. The community consists of readers, journalists, and any citizen interested in the Civil project. What distinguishes the community from the greater public is that community members have acquired tokens allowing them to participate in the self-governance process and to have control over the Civil protocol (Civil, 2018c). Against a deposit, they have the possibility to suggest modifications of the Civil Constitution and the parameters of the Civil Registry (e.g. amounts of deposits, duration of decision-making processes, etc.).

Strictly speaking, the newsrooms are also part of the community. In order to better illustrate the relationships between newsrooms and the readership, Figure 2.7 presents the community and the newsrooms as two separate entities.

Figure 2.7   Civil's ecosystem

2.4.2 Civil's cryptocurrency

The membership of the Civil community is reserved to those possessing an amount of Civil's Ethereum-based cryptocurrency CVL. Therefore, "owning CVL tokens means owning a piece of the Civil network" (Civil, 2019g). Token holders can activate certain functionalities in the Civil Registry: applying as a newsroom, launching, sponsoring or challenging other newsrooms, voting in challenges, and appealing decisions (see next section for a detailed explanation). Since the purpose of CVL is related to the governance of the Civil platform, it is defined a consumer token and not as a security (Civil, 2019g). Consumer tokens (utility tokens) are a means to access a product or service, whereas security tokens are tradable assets (O'Dair, 2019, p. 23). The chameleon character of the CVL token is supposed to attract consumers: it can be bought, sold, gifted and earned, and used to "make your voice heard" (interview S51).

However, CVL is not required to access content produced by Civil newsrooms. Most newsrooms rely on traditional funding models and conventional payment methods like credit cards and PayPal. The threshold between community members and pure readers is called the "Waterline". Citizens below the Waterline cannot participate in decision making processes on the Civil platform.

2.4.2.1 First token sale

In 2018, Civil planned its first Initial Coin Offering, i.e., the sale of tokens to the public as a funding source for the project. According to the so-called "100% Pledge", all earnings from the token sale would go to the Civil Foundation (Civil, 2018g). Civil wanted to sell tokens between $8 million and $24 million (Civil, 2018f) within two weeks starting on September 18, 2018 (Iles, 2018c). 34,000,000 tokens were

available for the sale which corresponds to 34% of all existing CVL tokens (Civil, 2018d). Large-scale investors should individually be evaluated by Civil in order to prevent power imbalances (Civil, 2018b). Also ConsenSys had to commit to not using its acquired tokens for voting or only in close collaboration with the Civil Foundation (Owen, 2018b).

Despite a postponement of the deadline and Civil's attempts to receive funding from potential large-scale buyers (Cuen, 2018), the token sale failed on October 17 with a total amount of roughly $1.4 million tokens sold. A large part of the sum ($1.1 million) was provided by Civil's partner ConsenSys. From the outset the project had polarized; mixed reactions can be attributed to the general distrust in cryptocurrencies as well as a lack of understanding of the underlying blockchain technologies (Bilton, 2017). New York Times' author Jonah Engel Bromwich cites the opacity of the CVL buying process as a major reason for the failure of the token sale (Bromwich, 2018) while Columbia Journalism Review journalism Mathew Ingram thinks that the first token sale's design was "hugely overambitious and probably over-engineered" (Ingram, 2018, as cited in Woods, 2018). Internal as well as external persons had admitted to not understand Civil's model, resulting in the modest number of approximately 3,000 "investors". Shortly before the closure of the token sale, CEO Matthew Iles conceded that Civil is an "experiment" having "no magic bullet" and comprising the risk that "it might not work" (Webb, 2018). Civil announced to issue refunds for all participants of the failed ICO (W. Zhao, 2018).

2.4.2.2   Second token sale

Civil announced a new, uncapped token sale for 2019 without time limit. After the long and complicated proceedings of the first ICO, the second one is supposed to be

simpler and more streamlined, with a greater focus on journalism than on technological issues (Iles, 2018e). It was launched on March 6, 2019 and will continue until all 34,000,000 tokens are distributed (Kinsley, 2019a). The first tokens were then sold at $0.20 each while prices for the following tokens increase, until a maximum price of $0.94 per CVL for the last tokens (Civil, 2019g). The value is expected to rise if the demand for CVL will increase over time (Farivar, 2018). If all tokens are sold at the predicted price levels, the total revenue will account for $19.4 million (Kinsley, 2019a). The crypto tracker Coingecko shows that the real value of CVL fluctuates between almost 0 and the all-time high of $0,249217 which was reached on April 8, 2019 (CoinGecko, 2019).

2.4.2.3   Acquisition of CVL

Despite the promise of a simplified ICO, the acquisition of CVL tokens still requires several time-consuming steps (Civil, 2019g). Interested buyers have to dispose of a wallet, acquire ETH, pass a 30-minutes quiz about Civil (including questions about the start-up and CVL in order to verify if the person is aware of Civil's mission and not a potential speculator) and provide a proof of identity as cryptocurrencies are subject to anti-money-laundering laws and Know-Your-Customer regulations. After this process, the transfer of CVL can take some days because the Automated Clearing House (ACH) is entrusted with the verification of the transaction. However, people who join the network earlier get the tokens at a lower price and will benefit from an increase in value later on when the network expands and drives up demand and hence the token price (Zomorodi & Poyant, 2018a, 12:58).

2.4.3   Civil tools

The Civil ecosystem is working and experimenting around a toolkit of different blockchain-based journalism tools. This section presents four functionalities which are already in use – self-governance system, Civil Publisher, Civil Boosts and Civil Discourse – as well as two tools which are still in development – Civil ID and Civil's licensing tool.

2.4.3.1   Self-governance

As outlined in the very beginning, Civil seeks to establish a platform which is characterized by self-governance. These "community checks and balances" are supposed to increase quality of content, stimulate exchange among community members and increase trust. Moreover, community governance is intended to avoid arbitrary decision-making of single actors by relying on the rational behavior of the majority (Vuong, 2018). Due to this democratic design, the Civil platform can be seen as "the anti-platform" (Libby, 2018) and is rather similar to a DAO (Civil, 2017b). In 2020, Civil plans to introduce complete community governance, giving the community the power to elect the Council (interview J94).

〉   Vetting process

The self-governance system materializes in a sophisticated process on the Civil Registry called "vetting process" which includes up to six steps (Civil, 2019g). The core idea of the vetting process can be summarized as "s*pot the unethical Newsroom, and keep it off of the Civil Registry*." (Vuong, 2018, italics in the original).

When a potential newsroom applies, it has to stake an application deposit of 5,000 CVL (step 1). The Civil community has then 14 days to challenge the newsroom (step 2). A challenge means that a Civil member has doubts about the ethical compliance of the newsroom with the Civil Constitution. If no challenge is submitted during the two-weeks period, the newsroom is added to the Civil Registry.

If a newsroom is challenged (during or after the two-weeks period), the challenger has to stake 5,000 CVL for his assumption that the newsroom has ethical shortcomings (e.g. articles including misinformation, poor citations, hidden advertisements or product placements, etc.), and justify his challenge by referring to the parts of the Civil Constitution which are suspected to be violated. The community (as well as the challenger) can then vote by means of their tokens if the assumption will be accepted or refused. A majority vote (more than 50%) is needed for the final decision. Civil uses Partial-Lock Commit-Reveal (PCLR) Voting Contracts for all ballots. This special type of smart contract enables two crucial functions. First, the "partial-lock" part allows users to vote simultaneously on several challenges with all of their tokens. Second, the "commit-reveal" feature is similar to the proceeding of a real election where results are only published after polling stations are closed and votes start being counted: all Civil token holders first have to submit their vote within 10 days which is concealed with a 4-word voting code. The votes are then locked in the voting smart contract on the Ethereum blockchain. Subsequently, they can confirm the vote within another 7 days by using the code they received in the preceding step. Without this confirmation, the vote is not valid. This rule should restrict distorted results due to group thinking or other external influence.

If the community votes to accept the newsroom, it is listed in the Civil Registry. If the community votes to reject the newsroom, it loses its initial deposit and is not added to or removed from the Registry (if the vote takes place after the initial two-weeks

period). However, the newsroom or other community members who do not agree with the community's decision can request an appeal within the 5 following days (step 3). The appeal requester has to fill out a request form and deposit 5,000 CVL.

The ball is then passed to the Civil Council who has 14 days to review the community vote and explain its final decision in a public document (step 4). A simple majority is needed for making a decision; individual votes are not made public in order to prevent the community from seeing which Council member voted in favor or against (Al-Saqaf & Edwardsson, 2020, pp. 106-107). During this time, the newsroom is under appeal. If the Council agrees with the appeal requester, the appeal will be granted and the newsroom will either be accepted or rejected, according to the appeal requester's and the Council's opinion.

The decision-making approach of the Council is based on two principles (Schiller, 2019a). First, on "de novo reviews", meaning that the Council takes its decision independently from the prior voting result of the community; second, on "deferential reviews", referring to the principle that the Council is more likely to agree with the community in close calls. Only in case of strong violations, the Council may overturn the initial voting result. These principles should reinforce the community' power in the self-governance system.

After the appeal, the community has the possibility to challenge the Council's decision within 7 days by presenting an argumentation and staking a deposit of 5,000 CVL (step 5). The community is then invited to vote again (step 6). A majority vote of 66.7% is needed to overturn the Council's decision. The community vote in step 6 is the last possible vote in order to allow the community to have the final say.

The vetting process implies a so-called "reputational risk" for newsrooms. Even if unethical behavior on the Civil platform cannot be prevented, the self-governance system might discourage it because challenges can jeopardize the author's reputation (Howle, 2018). However, if a newsroom is rejected in the vetting process, it has the possibility to re-apply to the Registry. Moreover, the vetting process does not replace off-chain checks and balances like editors or other internal quality checks inside the newsrooms.

⟩   Reward mechanisms

The reward mechanism (Civil, 2019g) is designed to incentivize all token holders to evaluate newsrooms in terms of quality and ethics, hence promoting a peer-to-peer due diligence mechanism. Voters can stake as many tokens as they want. It is recommended to vote with all tokens in order to ensure a notable impact on the final decision; a community member can vote for multiple challenges at the same time. Each vote is weighted according to the amount of CVL that the voter possesses. This means that votes from members with a considerable amount of tokens have more impact than votes from members with only a small portion of tokens. For all users, one CVL token represents one vote.

Community members who vote in challenges can never lose their staked tokens (they can reclaim them after each challenge), but can be rewarded if they voted with the winning party. During a challenge, the challenge deposit is stored in the rewards pool, similar to an escrow account. Challengers and appeal requesters who lose their challenge will lose the deposit they staked for it. 50% of the deposit is then distributed to the winning majority, and 50% to the newsroom. If the challenger wins his challenge, he receives 50% of the newsroom deposit whereas the other 50% go to

the winning majority. The 50% for the winning majority is distributed according to the amount of tokens each voter has staked in the vote.

2.4.3.2 Civil Publisher

In addition to self-governance, permanent archiving of journalistic content is a core functionality of the Civil toolbox. Its user interface for front-end users (i.e., journalists and newsroom contributors) is implemented in a tool called Civil Publisher which interacts with the Ethereum blockchain. The publisher is a WordPress plug-in enabling newsrooms to publish articles on their websites, on the Ethereum blockchain as well as on the IPFS (Civil, 2019g). The Civil Publisher has been introduced with the second token sale (Dale, 2018). So far, WordPress is the only CMS that is compatible with the Civil Publisher. Every time an article is processed on the CMS, its hash, author and timestamp are automatically stored on the Ethereum blockchain (Kinsley, 2018). A smart contract is used to manage content and access rights. Each smart contract has a unique smart contract address which identifies a certain newsroom as the original source of a text (Okrzesik, 2018) and confirms that the concerned newsroom contributor has uploaded it (Kinsley, 2018). Journalists have the possibility to add a digital signature with the corresponding time stamp (Civil, 2019g; Okrzesik, 2018).

Newsrooms have two options to publish articles from their websites on the Civil network (Civil, 2019g). The first option is to create an index of the article. In this case, only the metadata (including signature, title, URL, public wallet address of the contributor, image details, original publish date, revision date, credibility indicators, etc.) as well as the hash of the concerned post is stored in both the Ethereum blockchain and the IPFS. This alternative is recommended if the text is published on

the newsroom's website behind a paywall and should not be accessible via IPFS or the blockchain. The hash reference allows to prove that the content of the article has not been modified since the last date of publication. If the article is altered, the new index must again be uploaded manually. The second possibility is to archive the whole article as well as an index of it on IPFS and, optionally, on the Ethereum blockchain. This option might provide a higher level of security and data protection as it creates a permanent, transparent and visible record of the text to the public, even if the newsroom uses a paywall on its website.

Every transaction, i.e., every upload on Ethereum implies a small transaction fee. If a journalist want to speed up the process, he can increase the gas fee (see section 2.1.4.9) he is willing to pay. The more money he offers validators to process his data, the higher his priority among the validators and hence the faster the processing (Civil, 2019g).

On December 17, 2018, Popula archived the first article ever on the Ethereum blockchain and the IPFS network by means of the Civil Publisher before its official launch (Bustillos, 2018). Soon three other First Fleet Newsrooms (Sludge, HmmDaily and Documented) followed suit (Libby, 2019). Sludge even used the archive function, i.e., stored its whole article on the IPFS (Moore, 2018).

2.4.3.3 Civil Boosts

The two main functionalities – self-governance and permanent archiving – were completed by a fundraising tool, called Civil Boosts, in July 2019. This tool offers newsrooms the possibility to collect public funds for the realization of a certain project. One can think of it as a peer-to-peer Kickstarter: newsrooms must set an

amount of money as well as a deadline and explain which purpose the funds will serve, and which outcomes the public can expect from the Boost. The whole donation history can be tracked on Etherscan (Civil, 2019a).

Although crypto (ETH) is an accepted payment method (together with credit card, Stripe, Apple Pay and Google Pay), it is not necessary to possess CVL tokens to proceed a payment on Boost: CVL only serves as a membership proof for the self-governance system (Civil, 2019a). Hence, donations are not limited to Civil members, but are open to the public. Vice versa, only Civil newsrooms are given access to the Boost tool (Iles, 2019a). Two newsrooms, Arepita and Creative Next, tested the new functionality first. After these first two Boosts, Civil added the possibility to send contributions by credit card since the obligation to possess crypto and a wallet deterred a lot of people from donating. In December 2019, eight Boosts have been launched in total. In November 2019, Civil announced that Boosts will be available to all newsrooms one month later (Schiller, 2019b).

Moreover, the tool will be refined by offering two different types of Boosts: Project Boosts continue to serve as a fundraising software for unique projects, whereas Story Boosts allow readers to donate for the newsroom's day-to-day business at the bottom of every story. Rewards and discourse features are also planned to be integrated in order to favor audience engagement (Iles, 2019a). From the donor perspective, the process of sending money to a newsroom for a Boost is not fundamentally different from the payment process on other websites. By clicking on a Boost project on the Civil site, the donor can choose an amount and a payment method by creating/using a Civil account or continuing as a guest. Credit card payments are processed by Stripe whereas ETH donors need a wallet from which the funds are directly transferred to the newsroom's wallet. The use and functioning of the Boost tool is hence less complex and time-consuming for audiences than for newsrooms who have to set up

and promote their Boost (see chapter 5) – a demanding task in view of the disappointing results of the Boosts: until January 2020, four out of eight Boosts raised 10% or less of their funding goal. Although better known, non-crypto fundraising tools exist, Boost offers newsrooms and donors a promising feature. While other crowdfunding platforms charge commissions for their services, Civil is not holding a stake in the Boosts.

2.4.3.4   Civil Discourse

Discourse features for general debates are already part of the Civil toolkit. Civil first used Slack, where it had set up different channels including a public channel for everybody not yet having acquired CVL tokens, a members-only channel, a newsroom-only channel and a private channel for conversations between newsrooms and the Civil staff (Civil, 2019d). However, user research conducted by Civil revealed that the Coral Talk-based discussion forum on the Civil website and the Civil Community Forum on Slack fostered the creation of silo discussions, and lacked possibilities to filter, structure and moderate discussions (Civil, 2019b). In August 2019, Civil announced some adjustments of the discussion forum on the Civil Registry. The revised version called Civil Discourse using the Discourse communication tool is the result of a working proposal developed by Civil and the community in spring 2019 (Civil, 2019e).

The Civil Discourse software allows journalists, readers, community members and the Civil team to interact and share their viewpoints about specific topics as well as to organize content by date, category, activity, views and replies (https://community.civil.co/). Discourse serves especially as a "record" for the vetting process and as a forum where newsrooms can be discussed more specifically

(interview M30). Civil's engineers, for example, can communicate with newsrooms about potential bugs and other technical details. All discussion are open to the public, but an account is needed to add comments. Since transparency is critical (interview J94), Civil does not communicate with newsrooms one-to-one, but assumes the role of an adviser on Discourse (interview M30).

2.4.3.5 Civil ID and the trusted web

In September 2019, Civil explained in a post (Iles, 2019b) how it wants to extend trust in journalism beyond the Civil Registry – the "Good Housekeeping seal for journalism" – and the vetting process: the start-up is developing a so-called Civil ID enabled by the "trusted web". This trusted web is defined as a web where the source of any information is verified by tracing back its origin, even if only in a pseudonymous way. In a more general manner, Civil defines the trusted web as "a common platform and universal record for curbing misinformation and data piracy while also funding quality journalism in a trustworthy way".

The Civil IDs will represent decentralized identifiers (DIDs) which provide every single journalist or newsroom with a unique ID (consisting of a public and a private key) they own and control themselves. Identity being an essential characteristic of blockchain networks, blockchain technologies will help to realize this vision. Assigning identities to newsmakers does not only allow them to cryptographically and anonymously prove their authorship, but also to better control their data and monetize their IP (Schiller, 2019b). For example, tracking published content stamped with an ID will allow to determine its "true performance and price via a modern metering system" (Iles, 2019b). Moreover, Civil ID will play a crucial role for licensing and smart advertising, as well as Civil Boosts (Schiller, 2019b).

What distinguishes the DID from contract addresses is that by means of DIDs, it is possible to issue and verify individual credentials on oneself or other persons and entities, for example licensing claims or other official permits (Ng, 2019). DIDs and credentials can be stored in different places across the web, so-called identity hubs, for example the Civil ID Hub.

2.4.3.6   Licensing tool

The Civil ID can be applied to a range of functionalities that are part of the Civil toolbox. As mentioned above, one of those applications could be the licensing tool which Civil is currently developing in collaboration with the Associated Press. The need for a new approach to licensing is grounded in the fact that the current model is "broken" (interview S51). Due to reproduction chain of content via several media organizations and publishers, original authorship is often undermined and not properly monetized. With Civil's licensing tool, newsrooms should be able to "track, control and monetize" content they license to external parties in order to improve the protection of their IP rights and help to understand "how information moves" (Iles, 2018, in Zomorodi & Poyant, 2018e, 5:46). License agreements will be managed automatically, blocking access to the content when the agreement has expired and penalizing licensees who violate contracts (Iles, 2018b). More information about the concrete functioning or use of the licensing tool have not been revealed during our interviews and in available public documentation; Civil announced further details about it in 2020.

2.4.3.7   Additional concepts

With its toolkit, Civil wants to be "a bold rebuke to the status quo" (Iles, 2018b). The presented Civil tools – Civil Registry, Civil Publisher, Civil Boost, Civil Discourse, Civil ID and Licensing are part of a larger ecosystem which Civil is continuing to extent in collaboration with its partners. For example, Civil plans a reputation score system linked to Civil IDs, a tool to track, index and rank content, an incentive system for audiences to share, rate and comment stories, and a functionality which allows users to choose their advertisers themselves, thus giving them full control over their personal data and providing news organizations with more efficient ways to customize content and ads. In view of an advertising model which is characterized by ongoing product devaluation, Civil wants to build a tool for smart advertising which helps publishers to recapture lost revenue by providing them with a "programmable, verifiable number" of reached clicks. This number should serve as the single source of truth which protects publishers from an ad model that "is taking a significant amount of money out of [their] pockets" (interview S51).

Figure 2.8 illustrates the Civil toolbox in December 2019. As the licensing tool has not yet been launched when this text was written, it is framed in a dotted rectangle.

Figure 2.8   Civil's Toolbox (2019)

2.4.4   Civil's smart contracts

All listed Civil tools are backed by the Ethereum blockchain and its features. As pointed out earlier, Civil is employing smart contracts in different parts of the system: especially for the registration process in the Civil Registry, during challenges, or when articles are being published and updated. As those smart contracts represent a core element of the Civil platform, this section very briefly explains their technical functioning (Ng, 2018; Shteinbuk, 2018).

Given that storing data and running jobs in the smart contract is cost-intensive, Civil developed an off-chain system where data is processed. Whenever a smart contract is created, the Civil DApp (i.e., the tool for self-governance on the Civil Registry) will be able to use the contract's functions to send a transaction with input data to the blockchain. Calling a function triggers an event in the smart contract (which contains the newsroom address, the number of tokens the newsrooms has spent, etc.), and a new block is created by the nodes of the global Ethereum network. The event is then

stored in the transaction's block header. New events are also persisted (i.e., stored). Persisted data are records of all events that have been emitted by a smart contract. By persisting this information, Civil is able to trace back the state of newsrooms (waiting for approval, whitelisted, challenged, removed, etc.) as well as the state of uploaded content (published, updated, revised). This latter option is especially valuable with regard to transparency: the whole history of all revisions is persisted in order to allow journalists and readers to reconstruct modifications of an article. Users and external clients can then retrieve the persisted data via APIs, for example when they use the Civil DApp or analytical tools.

In the future, Civil aims to develop and test the so-called Civil Archiver which will watch for content that is published by newsrooms on centralized locations and then store it in the IPFS. This would allow journalists to permanently archive their publications on a separate, decentralized network and prevent loss of data in case central storage systems are shut down.

Recapitulating the profile description of Civil, some promising new features and models for journalists and news organizations emerge, but their long-term viability and disruptive potential has yet to be evaluated. Our interviews allowed us to elaborate a first assessment. Before presenting those results, we explain the theoretical and practical design of our research. For the case study to be empirically sound, it is imperative to build the research on a conceptual framework. In the next chapter, we present our framework that is based on two different theories developed by Patrice Flichy and Clayton M. Christensen.

CHAPTER III

CONCEPTUAL FRAMEWORK

The conceptual framework of a research is a set of theoretical concepts that are indispensable to understand the examined topic and that help to link essential theories to practice. In the present study, the conceptual framework consists of two approaches: the reference framework (*cadre de référence*) developed by the French sociologist Patrice Flichy which describes the realization of a technical project (1995), as well as the theory of disruptive innovation elaborated by the American academic Clayton M. Christensen (1997) which explains the impact of disruptive technologies. This chapter presents the theoretical concepts of each framework, and then merges them by explaining their complementarity.

3.1   Reference framework by Patrice Flichy

Patrice Flichy developed the reference framework in order to describe how innovation projects involving actors with different backgrounds navigate through the process of conception, building, implementation and final use. Therefore, it is also called socio-technical framework.

Flichy himself put it as follows:

> In summary, the socio-technical framework allows to perceive and understand the technical phenomena which we are facing and to organize one's action and cooperation with other actors. It consists of a set of knowledge, skills and technical artefacts which are mobilized in the execution of a technical action. The reference framework allows to structure the interactions an individual develops with technical artefacts and with other persons, to organize the interpretations and deliberations that the individual holds towards himself.[2] (Flichy, 2003, p. 130, translated from French)

The starting point of the reference framework is that a large group of actors (e.g. engineers, users, industrialists, repairers, distributors) from different social worlds (*mondes sociaux*) come together when working on a technical project (2003, p. 118). In the case of a blockchain news platform, journalists, editors, managers of media companies, software engineers, computer scientists, blockchain experts as well as lawyers, crypto experts, consultants, authorities, audiences and citizens all have to appropriate the new technical artefact (the blockchain-based news platform) in order to develop, use or improve it, or to set the right conditions for a successful implementation. The reference framework allows actors to understand the technical phenomenon they are facing, to subsequently organize their actions and the cooperation with others (p. 130). In order to successfully coordinate the project, all actors must operate in one common reference framework which tries to align their heterogeneous value systems. The framework is then a *frontier framework* between the social worlds, and the technical object becomes a *frontier object* (2003, pp. 120,

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[2] "En résumé, le cadre de référence socio-technique permet de percevoir et de comprendre les phénomènes techniques auxquels on assiste et d'organiser son action et sa coopération avec les autres acteurs. Il est constitué d'un ensemble de savoirs, de savoir-faire et d'artefacts techniques mobilisés dans le déroulement d'une action technique. Le cadre de référence permet de structurer les interactions qu'un individu développe avec les artefacts techniques et avec les autres hommes, organise les interprétations et délibérations que l'individu tient face à lui-même."

123). Outside the reference framework, the technical object would lose its meaning. The technical object is never a stand-alone artefact but part of a *family of innovations* that are using the same technical components (2003, p. 211). In our study, the blockchain news platform represents the technical object, and the underlying blockchain technologies the family of innovations.

The approach of the reference framework includes four main objectives (2003, pp. 121-122):

- integrating technology and society in one analysis;
- putting the technology at the heart of the analysis;
- focusing on the technological action (i.e., intentions, projects, deliberations and their progression as well as interactions among the involved actors and with the technical object) rather than on the technological facts (i.e., the technology itself);
- establishing stability among actors as well as between actors and the technological object.

The reference framework is split into two sub-frameworks, the framework of functioning (*cadre de fonctionnement*) and the framework of use (*cadre d'usage*) which are unavoidably linked to each other.

The framework of functioning is defined as the totality of all knowledge and know-how that is and can be mobilized in the technical action. It should already include information about the use of the technical object in order to facilitate access to its principal functionalities. However, the inventors have the possibility to successively test different frameworks of functioning in the elaboration phase of the project, and build their final framework on the principles of a previous one. Given that the

framework of functioning is not the "confluence of a theoretical utopia and a scientific theory" (2003, p. 209), it requires the negotiation with all actors involved, and structures these interactions taking place on different levels. For example, employees have to internally discuss with their team members as well as externally with the public in the form of publications and articles, and more specifically with their clients in order to meet their needs (for example they demand a user-friendly interface, etc.). Flichy introduces the notion of the "forum" to describe the place where the different social worlds come together to discuss and cooperate.

The framework of use includes the multiple ways of how the technical object can be used and appropriated. It is not limited to the user, but also involves the designer, aiming to facilitate the use of the object. The first draft of the framework of use is often designed to attract investors, or to arouse the interest of the management. This first "prototype" is likely to be inspired by existing comparable objects. Once used and tested in practice, feedback loops might then quickly identify that it has become obsolete. Again, negotiations are often the source of a more concrete framework. These negotiations include the project team as well as the first places where the artefact is used, and where users can report about its potential usage. As a result, the initial framework will be transformed in a more apt one and reaches a certain level of stability. In some cases, it can even become the social norm.

Flichy concludes that the framework of functioning concerns mainly the *technical use*, whereas the framework of use is related to the *social use* (2003, p. 126). This can be illustrated by looking at the different designations of the technical artefact. It can be rooted in the framework of functioning or in the framework of use. For example, Civil's platform is defined as a "decentralized communications protocol" which "will be mediated through the Ethereum blockchain" from the perspective of the framework of functioning, and as "decentralized marketplace for independent

newsrooms" from the perspective of the framework of use (Civil, 2018c). However, the frontiers of the two frameworks are not static; actors can pass from one framework to the other, and both frameworks can change over time, often in line with the technical evolution (Flichy, 2003, p. 127). With regard to their continuity, the framework of use is guided by a process of *diligence*, while the evolution of the framework of functioning is characterized by *total disruption* (2003, p. 222).

An innovation only becomes stable if the involved actors have successfully built an alliance between the two sub-frameworks, resulting in a new entity, the socio-technical framework (2003, p. 219). This process takes a lot of time. In the beginning, the new framework is considered a black box by the principal actors, and the relationship between the framework of functioning and the framework of use can still change. Later on, engineers and technical experts will accept the new framework, and consequently also a wider public of potential users. Alternative frameworks are abandoned, and the framework improves through economies of scale and learning curves. At the final stage, when the framework's penetration has been successful, it can lead to a technological lockout (*verrouillage technologique*) (2003, pp. 223-224).

More precisely, Flichy distinguishes three phases throughout the innovation process (2003, pp. 224-230). The first phase is characterized by *parallel histories* of the different social worlds which initially have no relationship to each other, but which are going to be part of the innovation project. Even those worlds playing a role only later in the project should be considered from the beginning. In the case of Civil, the two principal parallel histories are the emergence of blockchain technologies and the crisis of journalism. The histories of the framework of functioning are more specific and comprise only few social worlds, while the framework of use addresses a much wider group of actors. Given these parallel histories, an innovation has no single starting point but is rooted in different fields. In the second phase, the social worlds

begin to exchange about the potential use and conception of the not yet existing technical object; all possibilities of the new invention are discussed by engineers, and potential users get to know the technology. Since this phase is highly imaginary, unstable and marked by utopian reflections as well as disagreements, hence reflecting the ambiguous character of technology, the object initially represents a "travel object" (*objet-valise*), or even an "ideological bubble" (*bulle idéologique*). The third phase consists of a careful decision-making process about which solutions will be retained, and which will be abandoned in order to move from the abstract level of the travel object to the concrete level of the frontier object. When the innovation is confronted with the practical conception and real market situations, the promising air of the ideological bubble may quickly deflate. Therefore, it is important to involve mediators who know the different social worlds well, and who can assist the resolution of conflicts by finding a solution that is accepted by everybody. In the course of those mediations, the socio-technical framework solidifies, and the so-called technological lockout takes place. After the emergence of the final framework, the innovation process inside the framework continues. Users keep "poaching" by appropriating and re-appropriating the new object, whose final form is likely to differ from its initial, often abstract, ideas and prototypes (2003, p. 211).

During the whole process, actors can both be *strategists* and *tacticians* (2003, p. 131). Flichy borrowed these terms from the French Michel de Certeau and his work "L'invention du quotidien − Arts de faire" (1980). Strategies allow to identify future advantages and opportunities, whereas tactics benefit from occasions to execute spontaneous maneuvers and cannot exist without strategy. According to the author, strategy "possesses" a setting (*lieu*) whereas tactics does not have its own setting. In other words, "strategy is a resource for tactics" (Flichy, 2003, p. 132). The current role of the actors depends on the development progress of the technical artefact. In the beginning, actors are strategists since they first have to define the project and map

their scope of action. At earlier stages, actors leave the controllable context and start performing an interplay between strategy and tactics, whereas at the posterior stages, they become primarily tacticians. Finally, when the reference framework is completely established, the technical action is exclusively tactical. Moreover, the function of the actor in the project is crucial for the determination whether he is strategist or actor. A special case is the user who can be both strategist and tactician. When users demand particular functionalities of the technical object, they are in a strategic position; whenever they act in the framework of functioning (and thus "extend the act of the designer"), they acquire tactical skills.

In conclusion, Flichy points out that a socio-technical system is not the product of an "accident in history", but deliberately determined by the strategic actors who are building it (2003, p. 135). Despite the ambiguous notion of "framework" which might imply a certain limitation for the scope of action, the reference framework is designed in a way that it offers enough freedom of use for all actors.

Flichy's reference framework has been chosen as part of the conceptual framework because of two principal reasons.

First, our study examines a new technology (blockchain) applied to a social context (journalism). The socio-technical nature of the framework can help to understand the needs of all actors who are involved in the blockchain news project and who seek to appropriate the technical artefact (the platform), regardless of their background (technical or social). More concretely, an all-encompassing approach as proposed by the reference framework is necessary to address in one analysis the challenges of technological implementations like the application of blockchain technologies (representing the social world of designers, developers, engineers) and of a social settings like journalistic networks (social world of news consumers and community

members). Furthermore, both the "technological" and the "social" side should understand the context of the other group. For example, in order to increase the adoption rate of the platform, the underlying technologies have to be accepted by journalists and readers. At the same time, developers, computer scientists and engineers must be familiar with the current challenges of the news industry. As the alignment of these two groups of actors is primordial to ensure a successful implementation of the blockchain network, our analysis requires an approach which takes into account at once action and context (Flichy, 2003, p. 117). The sub-frameworks elaborated by Flichy can help to unravel these complex interactions that come into play. The special interest of the research with regard to the framework of functioning was to examine the technical design and setting of Civil's platform, and to deduct which competencies, skills and assets would be needed to implement the platform in other news organizations, with a special emphasis on the user-friendliness and accessibility of the platform. Concerning the framework of use, we aimed to analyze how the platform exactly can be used for journalistic purposes, i.e., how news are created, stored and diffused by journalists on the network, and how users and readers can contribute to these processes (donating, voting for newsrooms, participating in discussions, etc.).

The second major reason that the reference framework is part of the conceptual framework is its inherent balance of theoretical sufficiency and the absence of rigidity. In other words, although the framework summarizes crucial concepts about socio-technical projects, it leaves enough leeway for new categories that emerged in the course of the data collection and analysis. This is essential since the study pursues an inductive research approach that is based on the individual assessments and opinion of Civil experts (team members and users) as well as journalists in Quebec. In view of the various viewpoints about the impact of blockchain in business, the

participants' answers could not be foreseen. A too tight conceptual framework would hence have prevented us from being receptive to emerging aspects.

3.2 The theory of disruptive innovation by Clayton M. Christensen

Although Flichy's model helps to understand the realization of a blockchain-based journalism platform by setting up the underlying socio-technical framework, it lacks a key element which takes into account the specific novelty character of blockchain technologies. Therefore, Flichy's reference framework is completed by the *theory of disruptive innovation* developed by Clayton M. Christensen in 1995. This theory seems adequate to address the particularities of a set of technologies that is not yet well explored and deployed. In the same way as the socio-technical project proposed by Flichy, disruption is also a process; mainly one in which a "smaller company with fewer resources is able to successfully challenge established incumbent businesses" (Christensen, Raynor, & McDonald, 2015).

Disruption is by no way exclusively an economic phenomenon, but can rather be seen as a consistently repeating pattern (Christensen et al., 2012, p. 6). In the economic context, disruption is closely linked to the fast-moving technological environment in which blockchain technologies are situated as well. Nonetheless, not every technological invention or innovation is automatically a disruption. To clarify this idea, Christensen distinguishes between two types of innovations: sustaining and disruptive technologies. Most technological advancements are sustaining technologies which improve the performance of existing products and provide better attributes to the most important customers. They can be incremental as well as radical, and the leading companies developing them are usually ahead of their competitors (Christensen, 1999, pp. 8-9). In contrast, as outlined earlier, disruptive

technologies initially lead to a downgraded product performance and underperform established products. However, they may outperform in later stages and address evolving market needs. Although they offer a new and different value proposition to the customer, e.g., they can be cheaper and simpler to use (Christensen, 2016, p. xix), mainstream customers often lack the willingness as well as the ability to apply disruptive technologies in existing applications they master (Christensen, 1999, p. 9). Often they underperform in one or two categories which customers value more than others, while addressing "overlooked segments" by established companies (Christensen et al., 2015). They hence can trigger the emergence of new markets where their value proposition is appreciated (Bower & Christensen, 1995, p. 45). More bluntly, "at the point a company needs to make a strategic commitment to a disruptive technology, no concrete market exists" (1995, p. 50). It is crucial to understand that it is not the technical characteristics of the existing technologies that the disruptive technology will outperform, but the performance demanded by the market. For example, Bower and Christensen explain that "[...] although personal computers did not meet the requirements of mainstream minicomputer users in the early 1980s, the computing power of the desktop machines improved at a much faster rate than minicomputer users' *demands* for computing power did" (1995, p. 44). According to this principle, blockchain technologies can still be defined as disruptive even if they have greater technical shortcomings than other technologies concerning for example scalability, energy consumption or interoperability.

Disruption has taken place as soon as mainstream clients increasingly turn towards the pioneer's offer (Christensen et al., 2015). However, only when an emerging technology catches up or even surpasses the performance attributes demanded by the existing market and delivers the quality standards customers are used to will they be interested in adopting it – often too late for established companies to integrate the new technology in their value proposition (Bower & Christensen, 1995, p. 44). This

is what Christensen calls "the innovator's dilemma", defined as the "false choice between today's revenues and tomorrow's digital promise" (Christensen et al., 2012, p. 6).

According to Christensen, the reason why companies fail to keep up with industry standards when new technologies emerge is that they "stay close" to their customers and primarily want to fulfill their needs (Bower & Christensen, 1995, p. 43). Business processes, including market research, are designed to spot technologies that serve these needs and to ignore those who do not (1995, pp. 44, 49). Another problem is that consumers themselves often cannot express what they would like to have since their behavior is guided by those solutions that already exist (Christensen et al., 2012, pp. 10-11). The small markets in which disruptive technologies are successful are not attractive for big companies from a financial point of view, leading to the conviction that investing in them might not sufficiently contribute to the company's growth. In order to wipe out competitors working with the new technology, incumbents can try to go *upmarket*, i.e., focusing on sustaining technologies in market segments where profit margins are higher. However, they then risk overlooking the new competitors arriving upstream with a downmarket strategy (Bower & Christensen, 1995, p. 47).

Christensen suggests incumbents not to take the lead in developing disruptive technologies but to let small companies test the waters and then be "second to invent" (1995, p. 51). This strategy allows big companies to identify the needs of their customers, and customers to find out what they expect from the new technology. In this context, Civil's pioneering role can contribute to a pre-analysis of market demands in the journalism industry and their accordance with the capabilities of blockchain technologies. Focusing on small and medium-sized newsrooms will help to experiment in a modest context and prevent the project from failing due to unrealistic targets. Nevertheless, it is important to note that the final aim of disruptors

is nothing but modest: they seek to fix the business model, not only the product – a venture that takes a lot of time, explaining why incumbents often overlook the technology's potential (Christensen et al., 2015). Hence, disruptive technologies are often underestimated in the beginning and have a lot of critics; blockchain is in this phase right now. Before the technology disrupts the whole industry, bigger companies should then adopt the new technology, while at the same avoiding to "overreact" and replace the core business by the new technology (Christensen et al., 2015). Instead, Christensen recommends running the disruptive innovation in a side project in order to separate the current business from the future business (Christensen et al., 2012, p. 20). It has to be noted that disruption is happening even if incumbents and entrants coexist for a long time period (Vázquez Sampere, Bienenstock, & Zuckerman, 2016, p. 27).

What is more, there is a general discrepancy between the development of customer needs and the pace of technological innovations. This means that companies often flood their customers with technological novelties which the customers are not yet prepared for. Sustaining technologies follow a constant rate of improvement that offers customers an added value whereas disruptive technologies do not meet the expectations of the clients in the beginning (Christensen, 1999, p. 14). Usually, the performance improvement that the customers are able to absorb increases slower than the improvement that technologies (sustaining as well as disruptive) could provide to the market (1999, pp. 6-7). The evolution of these two types of performance improvement can be graphically depicted in *performance trajectories* (1999, p. 13), illustrated in Figure 3.1. One factor influencing the customers' ability to absorb new technologies is the time they can invest in understanding its functionalities and adapt their use, work and lifestyle accordingly. This behavioral pattern can be linked to questions mobilized in the framework of use: in which manner can users be incentivized to appropriate the blockchain network compared to other news

platforms? In addition, Christensen emphasizes the need for technological capabilities in the course of the implementation of a disruptive technology. He defines them as "the processes, habits and aptitudes of personal interaction, which enable engineers and scientists to understand and optimize the technological interactions amongst the materials and components used in the product" (1999, pp. 386-387).

Figure 3.1   The Disruptive Innovation Model (Christensen et al., 2015)

Taking into account these reflections, the decision to invest in a disruptive technology is not a rational one; it would force a company to go *downmarket* (Christensen, 1999, p. 15) because the technology initially attracts insignificant markets and fringe customers, and only generates lower margins instead of higher profits. The failure framework is particularly interesting because the key characteristics of a disruptive innovation in its early stage correspond to the features of current blockchain applications: so far, blockchain technologies are only deployed in experimental side projects, are understood particularly in specialist circles and unknown to as well as even unwanted by mainstream customers given their novelty character and opacity of

their benefits to the wider public. However, especially due to the technologies' value proposition to eliminate the need for central control parties, they have the potential to disrupt certain industries in the long term, even if such impacts are not yet perceptible.

Despite the overlaps of blockchain technologies and Christensen's definition of disruptive innovations, this setting is yet an ideal. When applying the theory of disruptive innovation, caution should be exercised with regard to its pervasiveness. Christensen et al. noted an increase in the use of the buzzwords "disruptive innovation" and "disruptive technology" in articles although the theory does "not apply to every company in a shifting market" (Christensen et al., 2015). The theory's author himself warns that the model is likely to have become "a victim of its own success": it has often been "misunderstood" and "misapplied", basically whenever an industry is experiencing fundamental change.

The historian Jill Lepore states in her well-known critique of Christensen's theory that since its publication, "everyone is either disrupting or being disrupted" (Lepore, 2014), leading to an oversimplified classification impeding any finer distinction. The "mantra" (Christensen et al., 2015) of "disrupt, and you will be saved" (Lepore, 2014) is susceptible to encourage black-and-white thinking patterns and also applies to the context of journalism. Hermida and Young also criticize the "stereotypes of technology as binary options in hero or harbinger, and news organizations as disrupting or disrupted" (Hermida & Young, 2019, p. 26).

A lot of business executives fail to understand that the theory does not deliver explanations about the whole innovation process or the secrets of business success (Christensen et al., 2015). In most cases, a technology is not inherently disruptive or sustaining − its final path is determined by the strategic decisions of the business. The

gap between the theory's promises and its practical implementation can partly be explained by the lack of research about its validity and generalizability (King & Baatartogtokh, 2015, p. 78).

Based on these considerations, this study does not presume from the outset that blockchain technologies will disrupt the journalism industry, but tries to assess their disruptive potential by analyzing their individual promises.

3.3   The complementarity of the two theories

As the two previous sections illustrated, both Flichy's reference framework and Christensen's theory of disruptive innovation can be linked to the project of applying blockchain technologies to the journalism industry. However, it is also crucial to merge the two theories and to show how they complement each other in order to dispose of a coherent framework for the data analysis.

First of all, the two frameworks complement each other with regard to the perspectives on innovative technological projects. While Flichy focuses on the internal realization of the project on company-level, Christensen looks at the impacts of such a project on industry-level by analyzing the interplay of incumbents and entrants. These different angles correspond to the research objectives of our study. We aim to understand the opportunities and challenges of the development of a blockchain news platform inside a media company as well as the technologies' implications and disruptive potential for existing business structures and processes in the news industry as a whole.

However, each theory has its shortcomings, which the other one can help to overcome. For example, there is a mismatch between Christensen's theory of disruptive innovation and its application in the journalism industry. Historian Jill Lepore (2014) argues that the principles of the theory of disruptive innovation do not necessarily align with the principles of institutions operating differently than the capitalistic businesses that Christensen examined for his study. Hospitals, museums, universities and also journalism, for example, have values and obligations "outside the realm of earnings" in contrast to for-profit companies primarily increasing revenues and seeking to satisfy their shareholders. For Lepore, these institutions do not even qualify as industries. In the case of journalism, Lepore's arguments can be linked to the unwritten law that journalists have to serve the public and democracy, whereas the profit-oriented framework in which a lot of newspapers are working today has been shaped by the capitalistic market structures they are surrounded of. Already back in the 1960s, Kesterton noted that "the proprietor has superseded the editor in importance" (1967, p. 84). Analogously, Hermida and Young note:

> The notion of disruptive innovation is one way that technological change is being understood in journalism. It has infiltrated organizational narratives and become perceived as a necessity for success bolstered by time-pressured binary futures of adapt or be left behind. It is an insufficient model, however, to make sense of the complexities of change occurring within various systems of journalism. (Hermida & Young, 2019, p. 53)

Flichy's framework is closing this gap by eliminating any micro-economic considerations, for example price-oriented issues (Flichy, 2003, p. 221). Instead it focuses on the social background of the involved actors and their role in the innovation project, independently of its final success or failure. Zammuto et al. explain: "Thus, one cannot talk about a complex technology without reference to the social setting" (Zammuto et al., 2007, pp. 752-753). The impact of technology on the competencies required to use digital tools is also influenced by "continuing changes,

modifications and transformations due to not only the development of media technologies but also their application in different cultural and social contexts" (Zimmermann & Schreiber, 2014, p. 16).

Nonetheless, Flichy's attempt to align social and technological contexts lacks a historical dimension. Christensen's theory is valuable in this regard because "[t]echnological change does not occur in isolation [...]", but is also "historically [...] situated" (Hermida & Young, 2019, p. 70). The disruption model shows that innovative technologies depend on "the context of existing practices, are tamed to align with occupational norms or are deployed as opportunities for renewal" (2019, p. 70). In addition to the challenge of the unification of different social worlds, the decision to choose a certain technology over another is hence guided by the complex setting of technological innovations in the past (both inside a single company and in an industry as a whole). Moreover, there is not only one suitable technology, but instead a bundle of solutions – especially in earlier stages of the innovative process – which makes the final choice even more difficult (Flichy, 2003, pp. 207-208).

To sum it up, Flichy and Christensen complement each other in terms of the level of analysis of a technical project (company level versus industry level) and extend the other theory with regard to two important aspects. Flichy responds to the discrepancy between Christensen's theory and the characteristics of the journalism industry by adding a social dimension to the conceptual framework, while Christensen completes Flichy's model by taking into account past and future developments for the realization of a technological innovation.

Flichy and Christensen even agree in one regard: they are convinced that choosing, developing and deploying the right technology is a time-consuming process. In line with Christensen's innovator's dilemma, Flichy argues that the choice of the

appropriate approach depends on the strategic decision-making of the business. After this decision, it takes a lot of time until the socio-technical framework is fully developed (Flichy) and the technology proves to be disruptive (Christensen). The same might be true for blockchain technologies: their promises, especially in the journalism industry, might unfold at a large scale only within the next decades.

With these reflections in mind, both the reference framework and the theory of disruptive innovation helped us to answer the research question. We particularly wanted to understand:

- the opportunities and challenges of each tool and functionality of the Civil model in order to assess their disruptive potential;
- the design of Civil's framework of functioning, as well as its strengths and weaknesses;
- the design of Civil's framework of use, as well as its strengths and weaknesses;
- how the two frameworks can impact the disruptive potential of the Civil model and its tools.

In order to better situate the two frameworks and their relationship, Figure 3.2 provides a graphical overview about the conceptual design. Both Flichy's and Christensen's framework were used as conceptual basis for the development of the interview guides and as guideline for the subsequent data analysis. The complete methodological approach is presented in the next chapter.

Figure 3.2   Conceptual framework

CHAPTER IV

METHODOLOGY

In this section, we explain the methodology of our research. First, we briefly present the research method, before describing the procedure for data collection as well as the approach for data analysis.

We pursued a qualitative approach since our research puts "an emphasis on processes and meanings that are not rigorously examined, or measured [...]" (Denzin & Lincoln, 1994, p. 4). Given the novel character of blockchain technologies and their application in journalism, we aimed to capture fine nuances of the opinions of different actors. Civil who is already working with blockchain provided valuable pioneer experience about their project. Vice versa, actors in industries that are not (yet) familiar with the technologies had different assessments with regard to the technologies' disruptive potential. Accordingly, qualitative research is an appropriate approach to "study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them" (1994, p. 2).

Moreover, we conducted an inductive research, i.e., we wanted to create knowledge from findings in the field instead of confirming theoretical hypothesis set up front. Consequently, the epistemological perspective of the research is a constructivist one (Noël, 2011, p. 54). According to constructivist postures, several socially constructed

realities exist, implying that the studied phenomenon is situational, instead of amenable to immutable laws (2011, p. 66). Among other research strategies, the constructivist approach is applied to case studies (2011, p. 65).

4.1 Description of the research method

We used a single case study as research method which was carried out in two phases. First, we studied the business case of Civil by analyzing different documents and sources about the company in order to understand the use and functioning of the Civil model. Second, we carried out semi-structured interviews with the Civil team, Civil newsrooms and journalism experts in Quebec. We opted for experts in Quebec due to the accessibility of the research field, as well as the interesting options that the Civil model and blockchain technologies could provide for the Quebec journalism industry that is seriously hit by the current crisis (see chapter 2). With the interviews from these three groups of respondents, we aimed to answer the question if blockchain could have a disruptive potential in the journalism industry; they also helped to deepen the understanding of the Civil model and to discuss its validity. This section briefly defines the case study design and explains how we applied it in order to answer our research questions.

According to Yin, a case study is a "comprehensive research strategy" (Yin, 2003, p. 14) that is appropriate to understand a "contemporary phenomenon within some real-life context" (2003, p. 1), "[...] but when the relevant behaviors cannot be manipulated" (2003, p. 7). Consequently, a case study is usually holistic and context sensitive with the intention "[...] to gather comprehensive, systematic, and in-depth information about each case of interest" (Patton, 2009, p. 447). As blockchain technologies are only in development, a case study about a company operating with

blockchain allowed us to identify opportunities and challenges directly on the field, observe and talk to involved actors, consult a variety of documents, as well as to gather information that is not provided by theory.

At this point, it is important to note that we analyzed the Civil model as a whole. This means that we did not limit our analysis to one specific aspect of the model, but that we aimed to understand the entire business of Civil, including its business model, ecosystem, strategic plans, and developed tools. Therefore, the case study was realized as a *holistic single case* as proposed by Yin (2003, p. 40). The Civil model represented our unit of analysis since we wanted to examine the phenomenon of a blockchain-based news platform from an all-encompassing business perspective.

Moreover, single cases are especially appropriate when the object being studied represents an extreme or unique case (2003, p. 40). The uniqueness of the Civil case played a key role in our research design. Several arguments strengthen the choice for a single case. First, as we already outlined, Civil is one of a few blockchain companies working on a prototype for the media industry in general, and the only one so far experimenting with the journalism industry in particular. The scarcity of projects combining blockchain and journalism explains why it is difficult, yet unfeasible to opt for a multi-case study. In view of our goal to elaborate recommendations for news organizations that would like to test the Civil platform or blockchain technologies inside their business, the case study about Civil can provide first guidelines. A thorough and complete analysis of Civil as a single case can reinforce crucial elements of these guidelines, for example promises and challenges of the implementation of the Civil platform. Accordingly, taking into account Yin's remark that a single-case study corresponds to a single experiment (2003, p. 39), we analyzed the Civil project as the first venture of its kind whose future is still uncertain. We wanted to focus on Civil's individual history and development, without

mixing the particularities of Civil with those of similar blockchain projects, because this would have overshadowed the specific context and setting in which Civil evolves (crisis of journalism, loss of trust, crypto scandals, failed token sales, etc.) and which will determine the success or failure of the model in the future.

Second, Miles and Huberman point out that an extreme or deviant case can help to explore "highly unusual manifestations of the phenomenon of interest" (1994, p. 28). The single-case study design hence allowed us to be more receptive to particularities and deviations that emerged during data collection and analysis. This is especially important for the assessment of the disruptive potential of blockchain technologies in journalism where a nuanced spectrum of opinions can help to prevent hasty and general conclusions. With this in mind, the extreme, single case is key in answering our research question which is based on a theory that, in itself, can be seen as extreme. As Christensen's work shows, defining an emerging technology as disruptive requires detailed analyses and observations about particular companies and industries. In the case of journalism, we wanted to answer the question if blockchain can disrupt the industry *based on* the Civil case. In other words, we might not have been able to answer the research question without considering a practical example that provides evidence for theoretical conclusions. Flichy's theory complements this approach by delivering the socio-technical framework in which the creation, testing and implementation of a novel technological project should be situated.

The unique nature of the Civil model also explains the type of case study we chose. Yin identifies three types: exploratory, descriptive, and explanatory (2003, p. 3). The research addressed a set of technologies which are sparsely covered in literature and so far only experimentally deployed in practice. The objective of the research was hence to conduct an *exploratory* case study about Civil, providing first practical

evidence from the field which can serve as a hypothesis and starting point for future research (2003, p. 6).

4.2 Data collection

In order to realize this exploratory, single-case study, we collected data from different sources, i.e., we carried out data triangulation (Patton, 2009, p. 246). This helped us to capture a wide range of different perspectives and opinions about the Civil model and the disruptive potential of blockchain in journalism. Yin confirms that "multiple sources of evidence essentially provide multiple measures of the same phenomenon" (2003, p. 99), hence allowing "an investigator to address a broader range of historical, attitudinal, and behavioral issues" (2003, p. 98). The diverse data pool that we elaborated throughout our research built a summary of the controversial discussion about blockchain technologies in journalism. Among the six types of sources proposed by Yin (2003, p. 85), we chose two: documentation and interviews.

4.2.1 Documentation

Since Yin emphasizes the importance of a theoretical basis for the case study (2003, pp. 28-29), the analysis of the Civil model (first phase) consisted of collecting documentation about Civil. We were especially interested in Civil's business model, strategies, plans and objectives in its historical context. Understanding the business case was not only important for the final report of our findings, but also for the interviews with the Civil team on site. Hence, the analysis of the documentation additionally served as a preparation for the interviews in order to avoid questions that can be answered on the basis of publicly available information. Moreover, the

interviews helped us to clarify, deepen or reinforce particular elements of the case description.

The document analysis was an ongoing process and an integral part of our research from October 2018 until August 2019. Observing developments inside and around Civil over a longer time period was crucial because the last years (2017 – 2019) were characterized by several radical changes.

We collected information from a variety of different sources that were available on the Internet. First of all, the Civil website, white paper and Constitution were key documents that gave us a first overview about the Civil model and that we consulted throughout the documentation analysis. Second, the Civil help section on the website offered a "handbook" about the platform's functioning, and explained more complex structures and concepts like the token buying process. In addition, we read publications of and about Civil, articles in online news outlets, tweets and posts, listened to podcasts and watched related videos. Articles that were not written by Civil itself turned out to be an important data source since they often included interviews with the Civil team, but also provided critical perspectives on the project. Our most used source, however, was the website Medium where individual members of the Civil team regularly publish posts about new developments of the project. Depending on the expertise of the author, those posts delivered additional material about technical, organizational or strategic issues. Most of the posts were published in 2018 and 2019; however, some single, older articles from 2016 and 2017 revealed how Civil's initial business plans deviate from today's concepts. In order to trace back those initial business plans, we used the Wayback Machine, a publicly available archive that stores old versions of numerous websites. With this archive, we could access and compare the different versions of the Civil website over time (https://web.archive.org/web/*/https://civil.co/). The Wayback Machine was a useful

tool because the structure of the Civil website changed and still changes frequently, for example when a new tool like Boost was added to the ecosystem.

Furthermore, we included the Civil newsletters in our analysis. Two different newsletters exist. The weekly newsletter to which anyone can subscribe provided updates about the Civil project and tools, new newsrooms on the Registry, a selection of stories from the newsrooms, as well as news in the journalism world which Civil was particularly concerned about. We kept a logbook about this newsletter from November 2018 until November 2019. Especially the section "Why I joined Civil" became a crucial source for our analysis, representing short testimonies of selected newsrooms (20 in total) which Civil added to their newsletter from February 2019 until September 2019. In this testimony, the newsroom described its motivation to participate in the Civil project. During data analysis, we decided to analyze those statements and include them in the coding process. In the next chapters, those snippets will be called newsroom testimonies. They finally complemented the findings of our interviews with three newsroom journalists. The second newsletter is only accessible for Civil members. After our interviews with Civil in August 2019, Civil added us to the mailing list. This newsletter provided additional information about ongoing projects at Civil, for example in the form of surveys among Civil members about their use of specific tools.

The first results of the analysis of the documentation resulted in the description of Civil, including its model, ecosystem and tools, in section 2.4. We elaborated a first draft of the Civil description from June to August 2019, and continuously adapted it in parallel to the data collection in the field until December 2019. Any changes at Civil since January 2020 were not included in the final report.

The documentation about Civil was only the first step of our case study. In a second step, we carried out semi-structured interviews with three different interview groups.

4.2.2 Semi-structured interviews

According to Yin, interviews are among the most crucial sources for case study research (2003, p. 89). We conducted interviews with the Civil team, with newsrooms participating in the Civil project, as well as journalism experts in Quebec. The different procedures for each interview group is described in the next paragraphs. Nevertheless, the interview type was equal across the three groups. Since interviews for case studies should be "guided conversations" of an "open-ended nature" (2003, pp. 89-90), we opted for semi-structured interviews. In comparison to unstructured or structured interviews, semi-structured interviews allow researchers to "maintain some consistency over the concepts that are covered in each interview" (Corbin & Strauss, 2015, p. 39). In our case, this means that we determined the topics as well as related questions for each interview upfront, but remained open to "surprises", turning points or aspects that the interviewees considered especially important.

All interview guides were inspired by the conceptual framework. More concretely, every component of the framework led to a concrete question. With regard to the framework of functioning, we examined the technical requirements (infrastructure and know-how) that have to be fulfilled to develop the functionalities of the platform and the technical characteristics of the Civil model. Concerning the framework of use, we analyzed how different actors (journalists, other newsroom staff, readers, community members) can make use of the platform and its functionalities, and in which regard this use differs from conventional journalistic processes. Accordingly, we attached importance to the measures that can incentivize users and journalists to

appropriate the blockchain-based news platform compared to other news platforms. Furthermore, we explored how a media company implementing the Civil model or their own blockchain network would have to adjust its business. With regard to the definition of blockchain technologies as a disruptive innovation, we particularly wanted to understand which political, legal, economic and social requirements have to be fulfilled to make the blockchain news platform have a notable impact on the journalism industry. Last but not least, we examined which factors and particularities could have an impact on the way the disruptive potential of blockchain in journalism can be slowed down, strengthened or even unfolded.

Both face-to-face and remote interviews were recorded with a mobile device. Each interviewee was given a letter of consent before the interview, which the interviewee had to sign (by hand or electronically) and turn back to us. Among other ethical considerations, this letter also specified that the anonymity of the participant was preserved at all time. For example, we attributed three-digit codes to each interviewee, consisting of one letter and two numbers. These codes relate neither to the initials of the interviewees nor to the chronological order of the interviews, but were selected purely randomly in order to avoid any identifiable elements. They are used throughout chapter 5 and 6.

4.2.2.1   Interviews with the Civil team and newsrooms

For a deep and comprehensive case study, the direct exchange with Civil was indispensable. We contacted Civil in June 2019 by e-mail and explained our research objectives (see Appendix B). Civil immediately showed interest in the research project and proposed us four possible interview partners with different expertise, for an interview of 40 minutes each. Since this offered us the opportunity to have access

to different members of the Civil team, we finally fixed these four interviews with those team members at the Civil office in New York in August 2019. Three interviews were carried out at the office (two face-to-face and one remote), whereas the last interview had to be postponed to another day in early September which we then carried out remotely. The different professional profiles of the interviewees allowed us to add valuable material to the first phase of our research, and to set a more clear direction of the subsequent interviews with the Civil newsrooms and the Quebec experts. The interview guides for these interviews were elaborated based on our findings from the document analysis, and adapted to each interviewee and their expertise (see Appendix A).

Since we wanted to avoid a biased and one-sided perspective on the Civil project, we planned to additionally interview some Civil newsrooms which could offer insights into the project that Civil itself cannot deliver. Therefore, after the interviews with the Civil team, we asked the Civil team for the names of 3–4 newsrooms that could be interested in participating in our research project. After consultation with the newsrooms, Civil again proposed us three journalists from three different newsrooms who were willing to contribute to the case study. Initially, we aimed to interview one First Fleet newsroom, one new newsroom member as well as one that joined Civil some time ago. Our final interview partners did not comprise any new member, but nevertheless three very different newsrooms which had individual experiences with Civil and provided us with diverse viewpoints on the project. One newsroom contributor, however, only participated on condition that Civil would not be subject of the interview without giving any specific reasons. Instead, this person was only willing to talk about the promises and challenges of blockchain technologies in journalism in general. With this in mind, we prepared very different interview guides for each newsroom journalist (see Appendix A), taking into account how each newsroom makes individual use of Civil (retrieved from the newsletters and Civil

posts). After the first contact via e-mail in September 2019 which included a short summary of our research project (see Appendix C), we conducted all three interviews in October 2019. Since all three interviewees are located in the United States, we decided to carry out remote interviews via Zoom. In order to avoid misunderstandings, we call these interviewees American interviewees, American journalists, newsroom interviewees, newsroom journalists, or newsroom contributors throughout the next chapters and sections.

4.2.2.2 Interviews with journalism experts in Quebec

The last essential part of our data collection process was the consultation of journalism experts in Quebec. Since our research objective was to analyze the viability of the Civil model and the disruptive potential of blockchain technologies beyond the borders of the Civil community, we were especially interested in the opinions and viewpoints of external journalism experts. While the Civil team and the newsrooms mainly addressed aspects related to the Civil project, the Quebec experts could take up and develop these ideas. In other words, they built the bridge between the practical use case of Civil and the possible implementation of the Civil model or blockchain technologies inside other news organizations. Moreover, the "Quebec perspective" allowed us to capture viewpoints that were different from those in the United States (Civil and newsroom interviewees), limiting the risk of a biased and maybe techno-deterministic view on the phenomenon: actors involved in the Civil project might not see the same promises and risks than actors working in the journalism industry who do not know the Civil project. Consequently, journalism experts with a specific regional professional background like the Quebec one can formulate recommendations that go beyond the American journalism context. Our initial plan was to identify the disruptive potential as well as promises and challenges

only for the Quebec journalism industry. However, due to a lack of relevant data, we decided to analyze the disruptive potential of Civil model and blockchain for the journalism industry from a general perspective. This avoids excluding other journalism markets from the research, while addressing media companies in Quebec as well.

We especially focused on the composition of the Quebec interviewees. Given that our research problem was formulated within a "specific problem framing" (Bogner, Littig, & Menz, 2009, p. 3) – the disruptive potential of emerging technologies in a specific industry – it is valuable to attach great importance to expert knowledge. Experts can serve as "crystallization points" because they represent a whole group of professionals in a specific business field as well as valuable insider knowledge (2009, p. 2). The privileged access to special knowledge and functions of the experts are a key factor for the realization of the interviews (Meuser & Nagel, 2009, p. 24). However, the expert must not be confused with the specialist. In comparison to the specialist, the expert has a comprehensive overview of the whole specialist knowledge field, allowing him to detect problem causes and to elaborate solution principles (Pfadenhauer, 2009, p. 82). Pfadenhauer adds that apart from knowledge and problem-solving abilities, the expert's *responsibility* for the problem-solving process plays another major role in the determination of his expertise (2009, p. 83). Nevertheless, who is considered an expert depends on the research approach (2009, p. 89). For our case study, we defined someone as an "expert" if he or she has considerable knowledge about the local journalism industry. More precisely, we targeted any journalist, editor, media scholar or other professional who has been working in the industry for several years, has witnessed major upheavals in the industry, and is now involved in or concerned about its restructuring. We intentionally did not focus on journalism experts who had deeper technological

knowledge, or even blockchain skills. This would have produced the risk to carry out a techno-deterministic research.

In summer 2019, we created a first list of potential interviewees, based on web searches and scanning of profiles on LinkedIn. We finally sent invitation e-mails to some persons in September 2019 (see Appendix D). The search for Quebec participants turned out to be a difficult step in our research, proving that the phenomenon at hand is still very unknown. A majority of persons did not respond, or refused to participate due to a lack of expertise in blockchain, although we specified that blockchain knowledge was not a pre-condition for participation. In order to give the interviewees an overview of the Civil project and blockchain technologies, we attached a one-page summary to our invitation e-mails (see Appendix D). This one-pager should reassure the addressees, and provide them with a brief preparation for the interview by helping them to imagine possible promises and risks for the journalism industry.

Finally, two experts responded positively to our invitation. Since simple invitation e-mails had not been successful, we then switched to the snowball sampling approach. The objective of this method is to identify "information-rich key informants" (Patton, 2009, p. 237). Particularly in the context of expert interviews, this technique can facilitate access to key players in the industry (Bogner et al., 2009, p. 2). Accordingly, the two first interview partners provided us with additional names that could be interesting for and interested in our research. The snowball approach proved to be more efficient; we quickly found two other experts who were willing to participate in the project. All four interviews were conducted in French between October and December 2019.

With regard to the interview guides (see Appendix A), we followed the suggestion of Meuser and Nagel to elaborate open interviews with a topic guide for the exchange with experts (Meuser & Nagel, 2009, p. 31). Given that the interviewees did not know Civil in detail, we often added explanations to our questions or talked about a specific aspect more in general (e.g. smart contracts). Since we had several weeks between the interviews, we were able to adjust the individual interview guides after each interview. In this way, we could collect data iteratively and sequentially. Nevertheless, the structure of the interview guides was similar to the structure of the interviews with Civil and the newsrooms: questions focused on the promises and challenges of the *use* and the *functioning* of specific tools and models, and were complemented by questions with regard to the adoption of blockchain-based news platforms like Civil's in other news organizations, for example in Quebec.

Although the expert interviews enriched our case study significantly, it should be kept in mind that "knowledge production is an open-ended process, moving towards unknown futures" (Pfadenhauer, 2009, p. 29). Especially with regard to emerging technologies like blockchain, the assessment of the technology's promises and challenges is hypothetical and predictive, implying that expert knowledge should by no means be considered a static matter of fact.

Table 4.1 provides a synthesis of all our interviews. In the next section, we present our approach for the analysis of the collected data.

Table 4.1   Synthesis of the interviews

Interview group	Civil team	Civil newsrooms	Quebec experts
Number of interviewees	4	3	4
Selection criteria	Breadth of roles and responsibilities at Civil	Diversity of newsroom profiles, use and experience with the Civil platform	Depth of expertise and experience in the journalism industry
Contacting	Presentation of the research project by e-mail	Recommendation and relaying by Civil	Simultaneous sending of invitation e-mails and subsequent snowball sampling
Interview time	August and September 2019	October 2019	October – December 2019
Interview type	Face-to-face (2) and remote (2)	Remote	Face-to-face
Role of interviewees	Understanding the Civil ecosystem and tools in detail, clarifying findings from public documentation	Exploring the benefits and shortcomings of the Civil model and tools in practice	Discussing the Civil model; Exploring the potential of blockchain for the journalism industry

4.3   Data analysis

Qualitative analysis is a process of revision, organization, categorization, synthesis and interpretation of data in order to describe and explain the phenomenon at hand (Fortin, 2000, p. 459). In our case, data analysis is based on an inductive approach, meaning that conclusions and explanations are developed upon data collected in the research field (2000, p. 458). This approach is suitable since practical evidence as well as theories about blockchain use cases are scarce.

In order to keep the proceeding structured and to come up with sound findings, we based our analysis on three activity streams as proposed by Miles & Huberman

(1994, pp. 10-12): data reduction, data display, as well as conclusion drawing and verification. For the sake of simplicity, we present each of these streams in a linear way in this section although data analysis was carried out incrementally.

4.3.1 Data reduction

In a first step, the collected data should be condensed. This first stream of analysis is not only applied after data collection, but should be carried out throughout field work. This "process of selecting, focusing, simplifying, abstracting, and transforming the data" (Miles & Huberman, 1994, p. 10) can take various forms. Even before conducting our first interviews, we started capturing regularly the most striking elements of the case study in the form of a logbook about Civil, graphics linking theoretical concepts with the reality of Civil and blockchain technologies in general, or syntheses about observations and topics that should particularly be considered in the analysis of the case study. During data collection, we elaborated one-page summaries after each interview, and tables comparing the viewpoints of participants in one interview group with regard to essential topics, whereas after collection, we produced memos about code categories and sub-categories. The coding process of the collected interview material itself is also a crucial part of data reduction. As complementary and supportive statements, we also coded the newsroom testimonies titled "Why I joined Civil".

4.3.1.1   Coding

Even though coding represents a core part of data analysis, it should be viewed as heuristic, or "an exploratory problem-solving technique without specific formulas to follow" (Saldaña, 2009, p. 8).

We used NVivo as a supportive tool to organize the coding process and to carry out the next two analysis streams data displays and conclusion drawing. All interviews as well as the newsroom testimonies were transcribed, fed into the software and coded. In order to have a quick overview of the meaning of coded chunks, we added annotations to every chunk. This technique helped us to summarize the sense of our data (another form of data reduction) without detaching it from its context, or losing important details in our overall coding structure.

Given that the case study was an *explorative* one, we applied a combination of pre-determined coding and emergent coding. On the one hand, pre-determined categories helped us to build a rough structure of the data and to distinguish basic perspectives on the Civil model as well as on the promises and risks of a potential adoption. On the other hand, it was primordial to be receptive to emerging categories, i.e., topics that were covered across the different interviews, because prioritizing the context allows for better comparison between the statements of participants (Meuser & Nagel, 2009, p. 35).

We based the pre-determined coding on one part of the conceptual framework. The flexibility of Flichy's socio-technical reference framework allowed us to fix only the two rough categories "framework of use" and "framework of functioning" upfront. We rejected our first idea to also create a category called "disruptive potential". The reason for this decision was the potential bias towards the disruptive potential of

blockchain; in our opinion, statements in this category would have implied that blockchain technologies are disruptive technologies from the outset. Since we aimed to avoid a merely techno-deterministic viewpoint and instead to provide a bi-directional analysis about the disruptive potential (mapping both arguments that strengthen and refute the assumption that blockchain technologies are disruptive, as well as promises and challenges of such a potential disruption), we decided to answer our research question implicitly through the use of related categories.

The emergent coding process after data collection then allowed us to refine our two initial categories and to add new ones. For this purpose, we used three different coding techniques as presented by Saldaña (2009). First, we used descriptive coding, a technique that "leads primarily to a categorized inventory, tabular account, summary, or index of the data's contents" (2009, p. 72). Descriptive coding seemed to be an appropriate coding technique, given that it facilitated the identification of major topics addressed in the interviews, providing us with a quick and overall grasp of the essential points. Since the goal of our case study was to identify both positive and negative opinions about the Civil model as well as the disruptive potential of blockchain technologies, we also applied magnitude coding (2009, pp. 58-61). This coding technique adds binary indicators ($+$ / $-$) to the codes. In this way, we could split promises from challenges, and subsequently compare them across the three different interviewee groups (Civil, newsrooms, Quebec experts). Those two techniques were complemented with evaluation coding, an appropriate method for organizational studies (2009, p. 98) which allowed for a further assessment of the meaning of the coded statements.

In a final step, due to the combination of these three coding techniques, we were able to conduct pattern coding (Miles & Huberman, 1994, pp. 69-72; Saldaña, 2009, pp. 152-155). Miles and Huberman explain that pattern codes can be seen as a "sort of

meta code" that help to "identify an emergent theme, configuration or explanation" (1994, p. 69). Similar codes were bundled together to "analyze their commonality" (Saldaña, 2009, p. 153), resulting in a pattern code. As a consequence, the initial codes became sub-categories of these pattern codes. The identified pattern codes could be summarized in some main categories. Based on the conceptual framework, we could then build a tree structure of these categories, serving as a guideline for the structure of our analysis (Figure 4.1).

Figure 4.1   Tree structure of categories

In line with our research question(s), this tree structure facilitated an analysis in two steps. First, the coded data of the existing reference framework allowed for a comprehensive analysis of the Civil model. Understanding the Civil tools and governance models and how newsrooms can make use of them is crucial for the second step: the question if blockchain technologies have the potential to disrupt (parts of) the journalism industry as a whole could be answered with findings from the category "future implementation". The analysis about the potential adoption of blockchain inside news organizations revealed related promises and risks, as well as ideas how this adoption could be fueled or slowed down. Both the analysis about the Civil model and the disruptive potential of blockchain technologies in journalism were complemented by a category summarizing statements about journalism and technology in general. This category turned out to be a key theme for our study; we explain its implications more in detail in chapter 5, as well as other themes that emerged from our data analysis and coding process.

4.3.2   Data display

The second stream of data analysis, data display, often comprises methods of data reduction. While data reduction focuses on the condensation of content, data display adds a visual dimension to the process of analysis. In other words, this step helps to "assemble organized information into an immediately accessible, compact form" (Miles & Huberman, 1994, p. 11). Techniques for data display turned out to be valuable already in the preliminary phase of data analysis. More concretely, NVivo tools like word clouds, bar charts, distribution charts or cluster diagrams allowed for a first overview of striking topics and concepts. In the more advanced phase of data analysis, we applied different forms of data display: flowcharts and mind maps, tabulations, as well as matrices.

4.3.2.1   Flowcharts and mind maps

We used these types of data display throughout our field work and analysis. In order not to lose the link between analysis and theory, we tried to base each illustration on the graphic of the conceptual framework (see chapter 3). For example, we elaborated a mind map after the interviews with the Civil team where we illustrated which topic belonged to which part of the framework (framework of use, framework of functioning, disruption) with different colors. After all interviews had been coded, flow charts about main topics allowed us to identify first interrelations, connections and contradictions between single elements that had been mentioned by our interviewees. In order to be coherent with our literature review and Civil's business plans, we also included theoretical findings and aspects from the documentation about Civil in these flow charts. Finally, we summarized all identified categories and their relationships in a "macro" mind map which served as a graphical reference for the structure of the final analysis report.

4.3.2.2   Tabulations

In a next step, we created cross-tabulations in NVivo. In order to simplify the discovery of important themes, we produced one tabulation per category and for all interviewees. This form of data display allowed us to see the percentage contribution of each participant and each interview group to a certain category. Even if analyzing the frequency of specific opinions and viewpoints is not at the core of qualitative research, counting can be helpful for the identification of patterns and the judgment of its quality (Miles & Huberman, 1994, p. 253). For example, the tabulations of some categories revealed that almost no statements of the interviews with the Civil team were coded inside the framework of use; instead, Civil focused on the

explanation of the platform's functioning. This examples shows that by means of cross-tabulations, we could compare the interviewees' contribution across interview groups. Such comparisons were not only valuable for the identification of possible citations, but also provided us with an illustration of the topics that the interview groups were especially concerned of.

4.3.2.3 Matrices

Subsequently, we retrieved statements, citations, annotations or complete word chunks from the tabulations (by clicking on a tabulation field, NVivo displays all coded text that relates to the field) and summarized them in matrices. Most often, we produced one matrix per category, but in selected cases we included two related categories in one matrix. The fields of the matrices were ordered by interviewee (horizontal) and topic/category/sub-category (vertical). We then used different colors to identify similar opinions across interviews, and marked those elements and citations that seemed to be important elements for our conclusions. To each column, we added a field where we summarized the essence of the interviewees' statements.

In some cases, we illustrated the condensed content of the matrices once again in mind maps in order to resume principle ideas and their relationships more clearly. During this further process of data reduction, it was possible that further new themes emerged. More importantly, in order to avoid the creation of "category silos", we added the single mind maps to our "macro" mind map and illustrated how they can be linked to the overall picture.

In the next phase of data analysis, conclusions can be drawn upon the reduced data, and verified for their correctness.

4.3.3 Conclusion drawing and verification

The streams of data reduction and data display served as a support for the elaboration of conclusions and their verification. We built our conclusions as well as the verifications of those conclusions on several techniques proposed by Huberman and Miles (1994).

First, our analysis is characterized by *clustering*, representing a "process of inductively forming categories; and the iterative sorting of things [...] into those categories" (1994, p. 249). The applied coding technique, for example, can be defined as clustering. "Grouping and conceptualizing" (1994, p. 249) is helpful for outlining principal preliminary findings that can lead to valid conclusions. Clustering interviews by coding similarity, for example, was a graphical tool in NVivo we applied in this regard. The method of clustering was also applied for the analysis of cross-tabulations and matrices. In order to classify and structure the single fields of those graphics in more meaningful topics, we used different colors and tried to condense all the statements of one category in 4–5 clusters. In addition, this techniques allowed us to identify clusters across interviewees and topics which eventually helped us to draw several conclusions.

Furthermore, the identification of such clusters required the application of *comparisons,* a process of "checking out interpretations with participants and against data" (Corbin & Strauss, 2015, p. 65). Although data triangulation is a way to avoid biased conclusions, scanning the different data material for possible contrasts and comparisons is an additional method to prevent a one-sided analysis. Comparison diagrams in NVivo supported this step in the third analysis stream. In our case, we first compared the interviewees inside each group in order to explore the elements where they agree and disagree. Subsequently, we compared all participants across

groups. We especially paid attention to differences and overlaps in the statements of the American newsrooms and the Quebec journalism experts. While the newsrooms could report about their personal and direct experience with Civil and hence also about related promises and risks, the experts in Quebec were able to think out of the box and provide viewpoints from a distance. We also carried out comparisons between Civil and the other two interview groups, but since Civil might be susceptible to having an over-optimistic view on their own project, we examined deviating opinions on the part of Civil with caution.

Moreover, when we were comparing the findings emerging from the different interviews, we put an increased emphasis on *outliers*. Being attentive to outliers that do not correspond to other prevailing findings provides two advantages for the validity of the case study. First, outliers can help to "test and strengthen the basic finding" (Miles & Huberman, 1994, p. 269) of the research. Especially in the context of emerging technologies, striking remarks can offer new insights about the phenomenon. Since scientific evidence about blockchain technologies in journalism is scarce, it might be difficult for researchers to confirm if findings that were approved by the majority of interviewees are true. For example, it can be tempting to conclude that blockchain technologies are disruptive merely due to their novel character. Moreover, outliers could countersteer personal biases with regard to convenient findings since they force the researcher to acknowledge opposing viewpoints. Depending on the interview topic, we encountered outliers in each interview group, showing that different types of participants are valuable to obtain a broad spectrum of opinions. We tried to consider the outliers throughout our analysis, and to give them special weight in the presentation of our study findings.

Figure 4.2 summarizes the design of our research according to the different elements presented in this chapter. Once again, we point out that the presented process did not

take place in a linear way, but rather moved back and forth. In the next chapter, we present the results and most striking themes that emerged from this design.

Figure 4.2   Research design

CHAPTER V

RESULTS

In this chapter, we present the results of our case study. We were able to classify the results in two essential parts: 1) the viability of the Civil model and 2) the determinants for the adoption of the Civil model. The first part represents the interviewees' assessment of the Civil project, reflecting the promises, opportunities, challenges and risks they identified. The assessment is structured in two "categories". First, we present the interviewees' evaluation of *Civil's tools*, notably permanent archiving, micropayments and funding model as well as smart contracts. Second, we summarize the assessment of the *Civil community and self-governance system*. We outline the importance of the community for the Civil platform, and juxtapose the characteristics of social and technical self-governance. With regard to social self-governance, we additionally highlight the role and example of the "Wikipedia model" on the Civil platform as well as the lack of participation.

The analysis of the model's viability builds the basis for the second part which deals with the possible adoption of the Civil model by news organizations. We present both barriers to adoption as well as incentives for adoption that were mentioned by the participants. The interviewees listed a range of barriers to adoption:

- Technological immaturity and complex token sale;
- The use of a token as a payment method and governance tool;
- Legal ambiguities with regard to cryptocurrency;
- Discrepancy between user habits and blockchain characteristics;
- The special relationship between journalism and technology;
- The imbalance between costs and direct benefits associated with blockchain technologies.

In order to mitigate and overcome those barriers, the participants suggested different incentives for adoption which comprise different dimensions: consumer education of audiences and journalists (social incentive), improvement of the user experience of the Civil platform (technical inventive) as well as several economic incentives:

- Creating a sense of urgency inside news organizations;
- Promoting the project through diverse role models in the industry;
- Experimenting with blockchain in side projects;
- Pooling diverse skills in one project;
- Encouraging audience engagement through token rewards;
- Targeting the business model of Facebook.

We add to the section about the incentives a paragraph that explains how the experience with Civil differs for different types of media organizations (small, mid-sized and large).

5.1   The viability of the Civil model

5.1.1   Civil's tools

Based on the analysis of Civil's tools in section 2.4, the results of our interviews added new perspectives on the tools' viability in a broader industry context. This section explores the opportunities and challenges of the two functionalities permanent archiving and micropayments because those are the tools that our newsroom and Quebec interviewees were talking about the most. We did not address licensing and DIDs in these interviews. However, we add a small section about smart contracts.

5.1.1.1   Permanent archiving

The permanent archiving tool is viewed as both promising and challenging. Two major benefits were named by American journalists and Quebec experts. First, in view of today's imperfect, incomplete and impermanent archives and an increasing dependence on centralized servers of big companies, the blockchain can provide journalists with an additional, immutable, more reliable storage:

> It's always the fact that blockchain would prevent changes to the articles, so it would protect the integrity of the content of the archives. And often, with the Internet, there are texts that disappear, we don't know why, there are bugs with Google in the search engines. So it might be convenient to have a more reliable database than Google, Google News in fact.[3] (interview N63, translated from French)

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[3] "C'est toujours le fait que blockchain empêcherait des changements aux articles, donc ça protégerait l'intégrité du contenu des archives. Et souvent, avec l'Internet, il y a des textes qui disparaissent, on ne sait pas pourquoi, il y a des bugs avec Google dans les engins de recherche. Donc ça pourrait être pratique d'avoir une base de données plus fiable que Google, Google News en fait."

The interviewee even mentioned the possibility to monetize these blockchain archives:

> The media could monetize their archives of articles, videos, photos, and perhaps even podcasts eventually, and in return, there might be some revenue that could come from the archives each year.[4] (interview N63, translated from French)

The second promise of permanent archiving and the Civil Publisher is its traceability which could increase the quality of content:

> If there is a blockchain system that allows the public to verify, to make a real traceability of the information... yes, I think that the information in general, which is spread, which reaches the public, should be better.[5] (interview Y25, translated from French)

The Civil's permanent archiving tool also has some shortcomings. First, newsrooms are not obliged to archive their content on the blockchain. Only one of the interviewed newsroom contributors sporadically uses the Civil Publisher, whereas the other two journalists are not familiar with the tool at all. One Civil team member admitted that it is difficult to convince newsrooms to store content on Ethereum:

> And in my experience also, newsrooms just don't wanna break up their flow. They're publishing stuff and they add like an extra step unless there is a relevant benefit to doing it, it's hard to get them to do it. (interview W78)

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[4] "Les médias pourraient monétiser leurs archives d'articles, de vidéos, de photos, et peut-être même de podcasts éventuellement, et en retour, il y aurait peut-être des certains revenus qui pourraient venir des archives à chaque année."

[5] "Si justement il y a un système de blockchain qui permet au public de vérifier, de faire une véritable traçabilité de l'information... oui, je pense que l'information de façon générale, qui est véhiculée, qui se rend jusqu'au public, devrait être meilleure."

However, one expert noticed that small-scale use of the archiving tool will not allow blockchain technologies to unfold their potential: "Everything should be on the blockchain, not just a part of it. You're all in or you're out. [...] If the blockchain is all alone in its corner, it's not gonna work"[6] (interview N63, translated from French).

Last but not least, two Quebec experts pointed out that evolving events, opinions and mentalities clash with the principle of permanence. One of them noted that especially for journalists, the unavailability of possibilities to modify their stories could be a damage to their career, for example if they want to change their professional field.

> So sometimes there are things we wrote, we realize that we no longer agree with what we wrote 5 or 10 years ago. There is a theory that says we have to take responsibility for our past, our convictions and all that, but it is clear that in some cases, some people could lose jobs if their old articles reappear on the surface.[7] (interview N63, translated from French)

An expert from Quebec clearly stated, "what's true today may not be true later on"[8] (interview V14, translated from French). With the introduction of permanent archiving, greater responsibility and accountability could become norms in journalism:

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[6] "Il faudrait que tout soit sur la blockchain, pas juste en partie. You're all in or you're out. [...] Si la blockchain est toute seule dans son coin, ça ne marchera pas."

[7] "Donc des fois il y a des choses qu'on a écrit, on se rend compte que on n'est plus d'accord avec ce qu'on a écrit il y a 5, 10 ans. Il y a une théorie qui dit il faut assumer notre passé puis nos convictions et tout ça, mais c'est clair que dans certains cas, il y a des gens qui pourraient perdre des emplois, si leurs vieux articles réapparaissent à la surface."

[8] "Ce qui est vrai aujourd'hui peut ne plus être vrai plus tard."

It also comes with responsibilities. If those responsibilities involve being more transparent, accountable to the public, then those are the new rules of the game now.[9] (interview Y25, translated from French)

5.1.1.2 Micropayments and funding model

The second functionality which could offer an innovative benefit to journalists and newsrooms is the possibility to fund journalism with micropayments. As the lack of revenues in journalism is part of the crisis ("the crux of the matter in journalism is the monetization of content"[10], interview N63, translated from French), micropayments in journalism offer a new potential of monetization that does not yet exist on the Internet (interview V14).

The practical example of Civil Boost illustrates the benefits and challenges of an alternative funding model in the form of micropayments. An American journalist explained that the granularity of cryptocurrencies allows people to support multiple projects at a time and journalists to attract a larger donor base:

I could support 2,000 publications for that in a really effective way. And if they get a couple of hundred, thousand people doing the same, the writer, producer has a great project. [...] Mass, mass sign-ups, blockchain can facilitate that. (interview L68)

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[9] "Ça vient avec des responsabilités aussi. Si ces responsabilités impliquent d'être plus transparents, de rendre les comptes au public, ça seront les nouvelles règles du jeu maintenant."

[10] "Le nerf de la guerre en journalisme, c'est la monétisation des contenus."

The newsroom testimonies show that financial support, new funding models and ways to attain sustainability are indeed major reasons for journalists to join the Civil platform. For example, one newsroom admitted:

> We are in [a] struggling stage and are looking for the sustainable growth of the organization. We have found out that Civil is supporting independent newsrooms, and startups in achieving sustainability. So we joined Civil, with the hope [...] to develop a more sustainable funding model for the growth of the organization. (newsroom testimonies)

Although the Civil newsrooms welcome the possibility of a fundraising tool in general, the experiences of our interviewed newsrooms with the start-up's fundraising tool hugely differ. None of the three newsrooms has received crypto donations, or only a few. Two journalists explained that fundraising is a "part-time job" (interview R37), and can even be a "full-time effort" (interview L68). Only one journalist found that the Boost is easy-to-use, "slick software" (interview H12). However, the three journalists agreed on the fact that the biggest obstacle for the Boosts is that it is difficult to incentivize people to contribute in crypto. One journalist admitted, "I was not comfortable trying to get people to pay on Ethereum" (interview H12). In addition, there is a lack of a wider community which could be willing to donate. The same person summarized:

> What makes Kickstarter campaigns go is there's a large community of people on Kickstarter who are getting excited about it and driving it. And that's all visible. The Boosts live in a vacuum. Like I as individual can come and support a Boost, but there is not this greater infrastructure of visible community and engagement and sort of enticement to get me to spread the word, to get excited about it. (interview H12)

In line with the experience of the newsroom interviewees, all Quebec experts warned that micropayments cannot replace existing funding models, but represent only one possible alternative for the future, and can only *add* a new pecuniary pillar to the

wavering financial basis of journalism instead of being a stand-alone solution: "it can only be added, it can only be another variable. I don't feel like it's going to replace everything"[11] (interview Y25, translated from French).

The majority of newsrooms (which are all free to choose their funding model) rely on a combination of traditional funding sources, including subscriptions, advertising or philanthropy. With regard to advertising, Civil admitted in our interviews that the initial plan to exclude advertising from the platform – in order to drive forward the detachment from centralized entities – has been rejected. Instead, the start-up acknowledges the solid role of the "holy trinity" of media, news consumers and advertisers, and opts for a solution which tries to "break and put back together the ad model" (interview S51):

> So first of all, I was wrong. I think that there's... the spirit of it was right: the predominant form of advertising today is broken. But fundamentally a fully membership-driven, subscription-driven or philanthropically-driven model is not enough to support all the journalism that needs to happen around the world. And that's something that I came to learn only as I began to get a broader global perspective throughout this project. So there are large, large, large, like most of the world cannot afford to pay for the news. So we must find other ways. And many of the best news organizations in the world rely on advertising in order to survive and so we have to change our tune in order to support that model. (interview S51)

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[11] "Ça peut juste s'ajouter, ça peut juste être une autre variable. Je n'ai pas l'impression que ça va tout remplacer."

5.1.1.3   Smart contracts

We recognized that both newsrooms and Quebec experts did not have much experience and striking perspectives on the issue of smart contracts. In order to illustrate the ambiguous nature of smart contracts in the context of journalism, we only want to highlight two contradictory individual opinions in this paragraph.

One American journalist was enthusiastic about the opportunities of smart contracts. In his eyes, they can help small media to manage cross-media, many-to-many collaborations, for example by ensuring project delivery ("they reliably make sure that the project as described will be delivered", interview L68). The interviewee cited as an example the possibility to collaborate with data journalists that have been vetted by the community:

> Managing that through smart contracts with data journalists who have been vetted by the community or who have public reputations, simple comments and checks, would be an instant benefit to the works that we're already doing and we don't have the bandwidth right now to produce this with of a team of three. (interview L68)

However, the journalist admitted that "there is not a critical mass yet of journalists who are using Ethereum to be able to collaborate in this way" (interview L68).

In contrast, one Quebec expert explained that smart contracts cannot be used for the most traditional process of news creation where one journalist writes a story which is then verified and approved by an editor (interview F49): smart contracts would be completely incompatible with the journalistic process which is by no means linear and automatic. Multiple feedback loops among journalists, editors, fact-checkers and

other parties involved in the news creation process require dynamics and human judgment which cannot be managed by the code:

> There's nothing automatic about this. It's always a process involving humans who have to judge, well, I'm going to publish this article, do I want modifications, do I want an additional interview, are there a lot of French mistakes, is the lead good or does it have to be rewritten, should it be cut in half because it's really too long.[12] (interview F49, translated from French)

Instead of managing daily tasks of journalists with smart contracts, the expert sees maybe a potential for contracts on the management level or for advertising: "it's not my field, advertising, but on this side, it might apply"[13] (interview F49, translated from French).

5.1.2   Community and self-governance

In addition to the platform's tools permanent archiving, micropayments and smart contracts, the two elements community building and self-governance complete the Civil profile. This section discusses these features and how they can impact existing models in journalism.

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[12] "Il n'y a rien d'automatique là-dedans. C'est toujours un processus avec des humains qui doivent juger, bon, est-ce que cet article-là je vais le publier, est-ce que je veux des modifications, est-ce que je veux une entrevue supplémentaire, est-ce qu'il y a pleines de fautes de français, est-ce que le lead est bon ou il faut le réécrire, faut-t-il le couper de moitié parce que c'est vraiment trop long."

[13] "Ce n'est pas mon domaine, la publicité, mais de ce côté-là, ça pourrait s'appliquer."

5.1.2.1   The community as a crucial element for the Civil platform

In the context of the current crisis, the experts in Quebec are convinced that the notion of the community is becoming more and more important to journalism. Also, the newsroom testimonies clearly show that the notion of community was a major reason for many newsrooms to participate in the platform. The newsrooms appreciate several dimensions of the community (newsroom testimonies): being part of a global and diverse network of newsrooms ("expand our support networks and relationships with other independent media"), affiliate with other journalists ("fellow newsrooms motivate me"), sharing best practices and learning from each other ("see what happens when peers engage a common problem and plan mutually beneficial approaches to problems"), establishing partnerships ("we see Civil as vital to building publishing partnerships, reporting partnerships"), creating closer ties with audiences ("find the technique on how to grow our audience network"), and ensuring quality by participating in the self-governance process ("ensure the production of quality journalism"). One of our interviewees added that the value of the community is especially "these direct relationships with people" which also gives him a certain "cross-promotion" (interview H12). Another pointed out that the Civil community "gives me a little bit of cachet" (interview R37), and a newsroom in South America claimed that Civil offered them a "window to the world".

The Quebec experts unambiguously point out that for most media organizations, communities already exist: "but the media already have their community, so I don't know what else blockchain is going to provide"[14] (interview N63, translated from

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[14] "Mais les médias ont déjà leur communauté, donc je ne sais pas ce que blockchain va apporter de plus."

French). An increasing number of newsrooms rely on Facebook groups or other social media forums to discuss and exchange with their audience:

> For example, if you take, I think the Journal de Montréal, they have a Facebook group called "Dans le trafic". And they created a Facebook group to bring together a community to talk about mobility issues in Montreal.[15] (interview F49, translated from French)

In turn, one of our Quebec interviewees remarked that the diversity of the community could offer an interesting opportunity for international journalism "because there, on a single platform, I imagine you can have the shock of viewpoints."[16] (interview V14, translated from French).

Moreover, since Civil sees its newsrooms as a "spectrum", criteria for exclusion like language barriers can be absorbed by the community's diversity: "the idea is the community is large enough that there are members that speak the language or are able to translate kind of what is going on" (interview M30).

However, this diversity also has its weaknesses. The Quebec interviewee mentioned the community's incapacity to vet about ultra-local news which requires knowledge about the concerned region: "for ultra-local journalism, can we really know if the article about the mayor of such and such a small town, such and such a small village is wrong or not"[17] (interview V14, translated from French). Furthermore, not all

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[15] "Par exemple si tu prends, je pense au Journal de Montréal, qu'ils ont un groupe Facebook qui s'appelle "Dans le trafic". Puis ils ont créé un groupe Facebook pour rassembler une communauté pour parler des problèmes de mobilité à Montréal."

[16] "parce que là, sur une seule plateforme, tu as j'imagine le choc des points de vue."

[17] "pour le journalisme ultra-local, est-ce qu'on peut savoir vraiment si l'article sur le maire de tel petit patelin, tel petit village est erroné ou pas."

media might welcome the opportunity to exchange with their peers. In Quebec, for example, competitive thinking prevails in the industry:

> It's been a lot "everyone for himself", the media industry. And it's all about competition. [...] We're starting to be pretty secretive about our finances, our strategies, how we do things."[18] (interview F49, translated from French)

Closely linked to the notion of community, Civil's the self-governance system is the start-up's "biggest success" so far (interview J94). Our findings suggest furthermore that self-governance can be separated in social and technical self-governance.

5.1.2.2   Social self-governance

Social self-governance consists of the vetting process on the Registry. All three newsroom interviewees emphasized the positive impact of the self-governance system on their journalistic work. One journalist appreciated the "public stamp of trust" or "seal of approval" that the membership of the Civil platform offers his newsroom (L68). Another told us that since he has been a member of the Civil community and thus exposed to the ongoing vetting, the quality of his (lay) newsroom's content has increased:

> We're trained writers, we're trained designers but we're not coming from a journalism background. And I think that we were intuitively pursuing journalism in the right way, but getting exposed to Civil and the Civil Constitution and the expectations of the newsroom did lead us to improve

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[18] Ça a été beaucoup "chacun pour soi", l'industrie des médias. Puis c'est une question de concurrence. [...] On commence à être assez secret sur nos finances, nos stratégies, comment on fait les choses."

our processes. [...] But just the knowledge and experience that we were exposed to, really upleveled the journalistic quality of our work. (interview H12)

The third puts it more metaphorically: whenever he writes a story, he "puts his Civil eyes on" and asks himself, "does it pass the Civil test" (interview R37).

〉 The Wikipedia model as an example

As Civil explained us, the fact that not all newsrooms contribute to the discussions is part of the self-governance model of a diverse community like Civil's. Whereas only a small percentage of the community participate as active participants, the wider community who only wants to consume quality content benefits from their output:

There is this smaller community that ensures that somebody who is not necessarily interested in understanding [...] journalism, blockchain technology, any of this. They can still see this stamp of approval." (interview M30)

Civil compares this concept to the Wikipedia model. Already in the beginning of the project, Matthew Iles admitted that "[...] our model isn't dissimilar to Wikipedia's, but with a crypto kick" (Iles, 2018f). In September 2019, Vivian Schiller explained in the Civil newsletter: "When it comes to actively participating in a community, the 1% rule applies. This is true across many forums" (Civil, 2019f). The design of Civil's self-governance system could hence favor the creation of a less institutional form of journalism ("I think it could move journalism towards a model that is less institutional"[19], interview V14, translated from French). One Civil team member

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[19] "Moi je pense que ça pourrait faire évoluer le journalisme vers un modèle qui est moins institutionnel."

draws a comparison with politics: "It's like watching democracy in action" (interview M30).

Although one American interviewee assured us that self-governance participants are not "crypto people", but "community members who care about journalism" (interview H12), one of four experts in Quebec also criticized the Wikipedia idea. Given that the community might be too restricted, the community might suffer from a collective bias:

> And so it's enough that there's a particular topic on this network with a majority of people who don't think... who are confronted with it and then decide collectively that the article is false or that it doesn't work.[20] (interview V14, translated from French)

In other words, the opinion adopted by the majority might prevail on the platform and suppress alternative viewpoints, or as the expert puts it: "with the majority, you don't make evolve the rights of minorities or a mentality"[21] (interview V14, translated from French).

〉 Lack of participation

One of our American interviewees regretted that most Civil newsrooms do not participate in the self-governance system and the community:

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[20] "Et donc il suffit que sur ce réseau-là qu'il y a un sujet particulier avec une majorité de personnes qui ne pensent pas... qui y sont confrontés puis qui décident dans le fond collectivement que l'article est faux ou que ça ne fonctionne pas."

[21] "Ce n'est pas avec la majorité que tu fais évoluer les droits des minorités ou que tu fais évoluer la mentalité."

"There isn't much of a community in Civil. There are few people who are there all the time. [...] I decided that if there isn't going to be interaction – and I tried for a couple of months – then I'm wasting my time." (interview R37)

Vivian Schiller explains that the Civil platform is not yet large enough for a big, active community: "The challenge, however, for us is more pointed since we don't have the scale yet of larger forums" (Civil, 2019f).

An intrinsic apathy on the part of readers is another reason for limited participation. One Quebec interviewee summarized this challenge very well:

Now it may require less passivity on the part of the readers to be on a platform like this because the quality of this platform will depend on the interaction and energy that people invest in it to appreciate or not appreciate certain articles [...]. So I think it requires a change in behavior of readers with regard to the platform and its functioning. You don't just receive anymore, I guess, you have to interact, you have to have a reaction, take action. So I would say that [...] most people don't necessarily feel like having to take an action in addition to taking the time to get informed.[22] (interview V14, translated from French)

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[22] "Maintenant ça demande peut-être moins de passivité des lecteurs aussi d'être sur une plateforme comme celle-là, puisque la qualité de cette plateforme-là va dépendre de l'interaction et de l'énergie que les gens y investissent pour justement apprécier ou pas apprécier certains articles [...]. Donc je pense ça nécessite un changement de comportement des lecteurs par rapport à la plateforme elle-même et son fonctionnement. Tu ne fais plus juste recevoir j'imagine, il faut que tu interagisses, il faut que tu ais une réaction, que tu poses une action. Donc je dirais que [...] la plupart des gens, ils n'ont pas le goût nécessairement le goût non plus d'avoir à poser une action en plus de prendre le temps de s'informer."

5.1.2.3 Technical self-governance

In addition to the social self-governance system, the technical side of Civil is also managed by a wider community, as one Civil interviewee outlined.

The technical self-governance shows striking parallels with its social counterpart, as the interview with the Civil team member revealed. This paragraph summarizes the interviewee's explanations. The rules for the technical functioning of the platform (protocol, smart contracts, DApp, communication with Ethereum, scripts for testing, etc.) are embedded in the code. In the same way that the Constitution is a living document, the code is a living structure on Ethereum and GitHub which can be modified by the community and anyone who feels able to contribute. In the case of the code, modifications can be requested upon a wider developer community which ensures that no single entity manipulates the scripts. The principle is the same as on the Registry. The more eyes are controlling the code, the more difficult it is to introduce malicious content: "and there are all these developers around the world who can vet that code before it goes into the code base. So a lot of it gets blocked before" (interview W78). People without technical knowledge or programming skills can share their ideas with the developers on the Civil Discourse who then translate them into code: "we're in a Slack community, we're... even if you're not a developer you can go there and expose your ideas how like this community should run, ideas of like how we can improve things" (interview W78). In this process, the Civil team are "just stewards of it" (interview W78) who build the technological infrastructure and assist members with technical problems. Eventually, Civil wants to withdraw and make room for complete community governance:

> I think, once again, once the contracts are out there and we've set up the sort of community discourse, we at The Civil Media Company sort of

wanna be more hands off because we don't wanna be dictating in terms of how this community evolves. We assure that it doesn't go off the rails, you know, we wanna make sure that it's not filled with like malicious intent. (interview W78)

The same is true for the Registry, as one Civil team member expressed it: "If Civil were to disappear today, the Civil Registry would still exist" (interview M30). Ultimately, Civil wants to build a "public service" (interview W78) which is coherent with the mission of journalism, as a Quebec expert explained: "what we're doing is a public service. And by extension therefore also a common good"[23] (interview Y25, translated from French). Civil itself agrees that the platform is designed as a common good, but that its tools might not yet be in place to justify this attribute:

I'm sure that other people would think that we're not... maybe not quite there yet, that we don't have all the tools in place, but, I mean, I think yes, I think that Civil is structured and is intended to be a common good platform. (interview S51)

Table 5.1 presents the characteristics of both the social and the technical self-governance mechanism. The promises and challenges of all characteristics and functionalities of the Civil platform are summarized in Table 5.2. In the next section, we present the barriers to and incentives for adoption of the Civil model and its tools.

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[23] "Ce qu'on fait, c'est un service public. Et par extension aussi donc un bien commun."

Table 5.1   Social and technical self-governance on the Civil platform

	Social self-governance	Technical self-governance
Community control	• Registry exists independently from Civil • "Stamp of trust"; no single position of power • "Spectrum": newsrooms with different backgrounds come together • Rules are embedded in the Constitution	• Community owns the code • Request mandatory for modifications • Technicians and non-technicians work together • Rules are embedded in the code
Community co-construction	• Community can propose modifications of the Constitution • the parameters of the Registry (voting periods, CVL stakes, etc.) • Constitution is crowd-sourced as a Google Doc	• Community can propose modifications of the code • Code is open source on GitHub
Role of Civil	• Foundation "shepherds" (interview J94) the Constitution • Financial support • Support with skills and tools	• "Stewards" • Technical support

Table 5.2   Promises and challenges of the Civil model

	Promises	**Challenges**
Permanent archiving	• Immutable and complete archive for journalistic content • Traceability of copyright • Restore trust	• Risk of marginal use of permanent archive • Increasing gap between fake news and traditional media • Permanence as damage to career
Micropayments and funding model	• New potential of monetization • Granularity	• Does not yet attract the mass market • Cannot replace existing models
Smart contracts	• Potential for many-to-many collaborations between journalists • Facilitate monetization of content	• Not applicable to the classical workflow between journalists and editors
Community	• Offers small and mid-sized newsrooms a platform to establish contacts and relationships • Diversity absorbs criteria for exclusion	• Communities already exist • Not suitable for any form of journalism (e.g. ultra-local)
Self-governance	• Stamp of trust • Wikipedia model: small group takes care of the mass	• Risk of collective bias • Lack of participation

5.2   Determinants for the adoption of the Civil model

While we presented the strengths and shortcomings of the Civil model which were identified by our interviewees in the previous section, we examine the factors that favor and hamper the adoption of the model in the next sections.

5.2.1   Barriers to adoption

5.2.1.1   Technological immaturity and complex token sale

The first obstacle that was addressed by the Civil team and the Civil newsrooms is the technological immaturity of blockchain technologies. In the context of the Civil project, the token sale is the most striking embodiment of this immaturity.

A newsroom journalist mentioned the risk that Civil is associated with the unsuccessful ICO:

> Additionally I think Civil... you know branding is a tricky thing. And I think that Civil's branding is tight to the failed token sale. And so I think that's hard to overcome because a lot of people... you know, the token sale was the best known thing that Civil has ever done. And it didn't go well. So for people who are familiar with Civil that's probably what they think of at this point. (interview H12)

In our interviews, Civil clearly admitted that the conception of the first token sale was too focused on technical details instead of the needs of consumers who do not want to be involved in the back-end functioning of the process: "I think we got ourselves a bit breathless about the technology because we're excited about it but consumers just care about what it does for them" (interview S51). Analogous to the American journalist who felt uncomfortable with asking his audiences to buy crypto on the Ethereum network, Civil had the impression that it was a "huge user ask" (interview M30) to invite users to go through the multiple steps of the token process. The dilemma between the technological immaturity and user habits which led to "a lot of user friction" (interview S51) forced Civil to find a compromise between Web 2.0 and Web 3.0. For example, the Civil team explained in our interviews that due to performance reasons, a centralized state machine (i.e., a central server) is used,

storing activities of the platform and the states of newsrooms (accepted, challenged, waiting for approval, etc.). One Civil team member justified such interim solutions in vivid terms:

> We're in the Web 2.5 world. We're like... we sort of have to be in between because Web 3 is just simply not there yet in terms of performance and scalability. (interview W78)

The person continued:

> It's too much of a shift for most people to understand and technology really isn't... it's too slow, you know. It's like... it's too much latency, introduces too much latency in the system. And we can't expect people to wait and they don't really understand how it works. They expect it to work like Facebook. And it's not like that. They are like, this is too slow and I don't care about this. And so you have to... in order to push the industry forward, you sort of have to be in between. (interview W78)

In addition to the gap between Web 2.0 and Web 3.0, there is a significant discrepancy between user habits and the characteristics of blockchain technologies in their current state.

5.2.1.2   The use of a token as a payment method and governance tool

In addition to the technological immaturity and complexity of the token sale, the *use* of a token as a payment method and governance tool inside the Civil model is an object of criticism. Especially one American newsroom journalist hugely criticized the integration of the token in the Civil platform. In his opinion, the token is one of the main barriers that will hamper large-scale adoption of the Civil platform in the industry and its appropriation by a significant number of people. Due to the high

barriers of usage for non-technicists, he described the token as a "stopper" and "the poison pill" of the Civil project. However, he highlighted the difference between blockchain technologies and cryptocurrencies, implying that blockchain does offer benefits for the project, but that CVL does not: "I think blockchain is right and I think tokens are wrong." He further explained:

> I think the token is the worst for Civil. I think the token holds back Civil. Because it is a level of complexity, abstraction, things that people don't understand, that prevent them from engaging with Civil, prevent them from getting excited about Civil. And it's... I mean... you know, the project wouldn't exist without it, however, unfortunately, the genesis of the project is with a cryptocurrency-related organization. [...] And I think unfortunately the tokens are the biggest barrier to Civil really achieving the kind of success that I think that the idea warrants. Because it's clumsy. I mean I'm someone who already owned crypto, who had gone through that and set up my bank account, did all the hard and scary and time-consuming stuff. And the extra layer that how the tokens work, it's just gross. I think that it's a barrier that's going to make it really difficult to get mainstream adoption, acceptance and use of the platform. (interview H12)

The journalist explained that newsrooms have no choice to interact with tokens because Civil is a crypto company whose incentive structures are built around the promotion of CVL:

> The project wouldn't exist without it, however, unfortunately, the genesis of the project is with a cryptocurrency-related organization. And so all of the incentive structures around getting this going are around crypto and tokens and all of that sort of thing. (interview H12)

Consequently, newsrooms have no influence on the decisions of Civil, even if those decisions could affect the image of the newsrooms in a negative way (interview H12). The journalist implicitly described a dependence of newsrooms on Civil:

> You know any time you are affiliating yourself with a large company, getting involved with a large company, you know they're taking actions and doing things outside your vision and field of views. There's a certain... you know you have to accept a certain non-specific risk that those people outside of your control and vision do things that reflect badly on or negatively impact you. But certainly as a stakeholder in Civil, that's not something that I'm concerned about although I'm aware of the non-zero risk that is kind of floating out there. (interview H12)

A Quebec expert implied that cryptocurrencies could consequently also damage the reputation of news organizations: "But it's certain that for the media, their image is all they have. Credibility and their image, so there will always be great caution"[24] (interview F49, translated from French).

According to the experts, this caution stems from the fact that due to significant knowledge gaps, a lack of education and the bad press of cryptocurrencies, people tend to associate blockchain exclusively with cryptocurrencies and hence fraudulent activities (interview N63, Y25, F49, V14). One expert drew a comparison with the inability to understand foreign languages: "People just don't understand what blockchain is. For them it's like if I was speaking in Chinese, if I spoke to them in Chinese, it would be the same thing"[25] (interview N63, translated from French). Consequently, it is difficult to drive forward non-financial blockchain applications: "So it's very difficult [...] to promote other blockchain applications because people associate it too much with cryptocurrencies"[26] (interview Y25, translated from French). Instead, people decide not to appropriate the new technology: "the risk is [...]

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[24] "Mais c'est sûr que pour les médias, leur image, c'est tout ce qu'ils ont. Donc crédibilité puis leur image, donc il y aura toujours une très grande prudence."

[25] "C'est juste que les gens ne comprennent pas c'est quoi blockchain. Pour eux c'est comme si j'étais en train de parler en chinois, si je leur parlais en chinois, ça serait la même chose."

[26] " Donc c'est très difficile de faire la... de promouvoir d'autres usages de la blockchain parce que les gens associent ça trop aux cryptomonnaies."

that they decide to miss out on the technology"[27] (interview N63, translated from French). The intersection of crypto owners and paying readers can be expected to be rather small, as an expert remarked:

> The percentage of people who own cryptocurrency versus the percentage of people who pay for information, when you cross the two, you may end up with a very small percentage of the population.[28] (interview F49, translated from French)

5.2.1.3 Legal ambiguities with regard to cryptocurrency

The use of a token inside the Civil project also implies several legal ambiguities, described as "Far West" by an expert (interview N63). Even if Civil noted that crypto is not a "nefarious space" (interview S51) dominated by speculation and money laundering, the US law as a "watermark" (interview S51) can result in cross-national divergences, as the Civil team confirmed: the Venezuelan newsroom Arepita, for example, encounters no problems to win crypto donors due to the social and political acceptance of cryptocurrencies in the country (and thus was able to raise more than 100% of its first Boost): "in Venezuela people are more crypto-savvy than they are here, right" (interview M30). In contrast, several Indian newsrooms could not participate in the Civil project since the local government has forbidden crypto: "we had something like 10 or 12 newsrooms in India that wanted to join but India has banned cryptocurrencies upright" (interview S51).

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[27] "Le risque c'est juste [...] qu'ils décident de passer à côté de la technologie."

[28] "Le pourcentage des gens qui possède de la cryptomonnaie versus le pourcentage des gens qui paient pour de l'information, quand tu croises les deux, tu arrives peut-être à un très petit pourcentage de la population."

The delicate topic of crypto regulation is an additional reason why Civil had to design a complex ICO. In our interviewees, Civil explained that they were forced to include several steps in the buying process in order to abide by the law (KYC and anti-money-laundering procedures etc.) instead of facilitating the process and taking the risk of contravening the law:

> Many of the 44 steps actually had to relate to the consumer sort of acknowledging what they are about to do in service of regulatory concerns versus the risk of eliminating those steps making it technically easier for the consumer to possibly flying in the face of those regulatory concerns. (interview S51)

The last point is especially important in view of the remark of an expert who noticed that emerging technologies frequently tend to evolve outside this framework (interview V14).

Blockchain technologies do not only lead to ambiguities with regard to legal frameworks, but also to discrepancies between user habits and the technological characteristics of blockchain technologies.

5.2.1.4   Discrepancy between user habits and blockchain characteristics

This discrepancy results from the fact that users are not used to complex, time-consuming technologies, as a Civil interviewee acknowledged: "Given the restrictions on technology and what people who come in are expecting, it's a very huge gap" (interview W78).

In the eyes of an American newsroom journalist, the cause of current user habits are social media which have democratized easy-click usage, thus decreasing the willingness of users to learn the more complicated usage and functioning of blockchain technologies:

> The fact is the social media world taught us that everything is supposed to be easy. Everything is supposed to be... you know, you don't actually even have to think, you just look and the thing that you're supposed to click will present itself to you. [...] And you can just sort of follow the bouncing ball. And blockchain is not like that. Blockchain is one of those technologies that should... it's new and you actually have to learn about it. To say that I have any challenges, that's just a strange way of putting something that's brand new, that you have to learn how to do. (interview R37)

The person goes on to say that great innovations had never been discovered in an easy and linear way: "Wouldn't it be nice if all of human history just had had a click here? We never would have invented the wheel, we never would have discovered fire".

What is more, the use of several synonyms for describing ordinary people in our interviews with Quebec interviews and American newsrooms ("commun des mortels", "monsieur et madame tout le monde", "people in my neck of the woods", "the rest of the world") implies that blockchain technologies could outpace the capacities of John Doe. One Quebec expert noticed that the technical functioning of blockchain on the back-end is currently "more promising [...] than for the general public"[29] (interview Y25, translated from French); another one explained that the barriers to adoption relate to our epoch:

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[29] "plus porteuses [...] que chez le grand public."

> So I think it's anti-culture right now. It's not the culture in which people live. People are still consuming brands... and it's nebulous to most ordinary people. I think it's gonna take a generational shift before.[30] (interview V14, translated from French)

In addition to the observation that users and audiences are not familiar with blockchain characteristics, our participants pointed out that journalism has always had a special relationship with technology in general.

5.2.1.5 The special relationship between journalism and technology

There is a prevailing pessimistic attitude towards the chances of success of blockchain technologies in journalism among the Quebec interviewees. The experts themselves admitted that though part of the industry's history, technological changes have often not been welcomed, and journalists have always remained skeptical and doubtful about them: "I think it's the nature of journalists to be a little skeptical"[31] (interview V14, translated from French). What is more, they are convinced that social media and related emerging technologies are main reasons for the current crisis: "Emerging technologies are the cause of the current crisis because advertising revenues have shifted to other platforms such as Google, Facebook & Co."[32] (interview F49, translated from French).

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[30] "Donc je crois que c'est contre-culture présentement. Ce n'est pas la culture dans laquelle les gens évoluent. Les gens consomment encore des marques, des... Donc... puis ça c'est nébuleux pour la plupart du commun des mortels. Je pense que ça va prendre un changement de génération avant."

[31] "je pense que c'est la nature des journalistes d'être un peu sceptique."

[32] "Les technologies émergentes sont la cause de la crise qu'on vit actuellement parce que les revenus publicitaires sont partis vers d'autres plateformes comme Google, comme Facebook et compagnie."

One Quebec expert noted that journalistic work in the digital era increasingly means to develop multiple skills which were not part of the profession from the outset: "These are aptitudes, qualities that are not at the root of what journalism itself is all about"[33] (interview V14, translated from French). This clashes with the preference of journalists for a focus on their principal activities and the work that defines them:

> They're less concerned about it because they want to get out stories, that's like the main function. Journalists define themselves by what they do, the stories they write, the stories they manage to make available to the public.[34] (interview F49, translated from French)

Consequently, the level of persistence for implementing and testing new technologies turns out to be low:

> Of course, if it's complicated, they don't come, we're off to a bad start because the media don't have the time. Our adage is to try ideas quickly, but to accept that you fail quickly, too. When you've tried something and it doesn't work, you stop. You don't try for ten years. Okay, we tried to make a tablet app, there's just 2,000 people reading us on it, shlack, let's stop.[35] (interview F49, translated from French)

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[33] "Puis ça c'est des aptitudes, des qualités qui dans le fond ne sont pas à la base de ce qui est le journalisme lui-même."

[34] "Ça les préoccupe moins parce qu'ils veulent sortir des histoires, c'est comme la fonction principale. Les journalistes se définissent par ce qu'ils font, les histoires qu'ils écrivent, les histoires qu'ils arrivent à rendre disponibles au public."

[35] "C'est sûr que si c'est compliqué, ils ne viennent pas, on est mal parti parce que les médias n'ont pas le temps. Notre adage c'est d'essayer des idées rapidement, mais d'accepter tu échoues rapidement aussi. Quand tu as essayé quelque chose puis que ça ne marche pas, mais tu arrêtes. Tu n'essaies pas pendant dix ans. Ok, on a essayé de faire une application tablette, qu'il y a juste 2000 personnes qui nous lisent là-dessus, shlack, on arrête."

A Quebec interviewee described the situation in Quebec:

> So anything that's going to require an investment right now is not welcome. [...] I find that... the Quebec media are still very institutional and very hierarchical, and not very agile with new technologies.[36] (interview V14, translated from French)

What is more, journalists would not take advantage of the full potential of technology, especially with regard to monetization:

> So we don't take advantage of platforms to monetize and facilitate. [...] And because there is no profitability, we don't take advantage of certain new platforms that could allow the media to rejuvenate audiences, reach out to new audiences, etc., etc.[37] (interview V14, translated from French)

Another expert added that this was true for a range of new technologies: "as they resisted the Internet in the 1990s and 2000s, as they resisted paywalls, as they resisted Google and then Facebook and then video too"[38] (interview N63, translated from French). Journalists do not realize that "the train passes once"[39] (interview N63, translated from French). For an established industry with a traditionally big power and key role in society, incentives to understand new technologies are scarce: "most newsrooms are pretty old-fashioned, they have no incentive to understand how it

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[36] "Donc tout ce qui va nécessiter un investissement en ce moment, c n'est pas bienvenu. [...] Je trouve que... les médias québécois sont encore très institutionnels et très hiérarchiques, et pas très agiles avec les nouvelles technologies."

[37] "Donc on ne profite pas des plateformes pour rentabiliser et faciliter. [...] Et à cause qu'il n'y a pas de rentabilité, on n'exploite pas assez certaines nouvelles plateformes qui pourraient permettre aux médias d'aller rajeunir les publics, aller chercher des nouveaux publics etc. etc."

[38] "Comme ils ont résisté à l'Internet dans les années 90 et 2000, qu'ils ont résisté aux paywalls, qu'ils ont résisté à Google puis à Facebook et à la vidéo aussi."

[39] "le train, il passe une fois."

might help them" (interview R37). This has led to a divergence between the industry's status quo and the technological state of the art:

> We can see that the media have primitive reflexes in fact, old reflexes of an old industry that has not adapted quickly enough to the digital revolution.[40] (interview N63, translated from French)

One Quebec expert saw the resistance to disruption on the part of the media even as a strength, implying that not every industry has the capacity to withstand innovation:

> What built the strength of our media and the capacity for resistance in our time, in history, is this institutional strength. When you are able to resist economic disruptions, technological changes et cetera.[41] (interview V14, translated from French)

This resistance also affects the Civil platform: one Civil team member pointed out that there is already a lot of inertia towards the project (interview S51). Due to the special relationship between journalism and technology, news organizations are likely to evaluate carefully the costs and direct benefits of blockchain, as the next paragraph shows.

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[40] "On voit que les médias, ils ont des réflexes un peu primitifs en fait, des vieux réflexes d'une vieille industrie qui s'est pas assez adaptée rapidement à la révolution numérique."

[41] "Ce qui a fait la force de nos médias puis la capacité de résistance dans l'époque, dans l'histoire, c'est cette force institutionnelle-là. Quand tu es capable de résister aux perturbations économiques, changements technologiques et cetera."

5.2.1.6 Imbalance between costs and direct benefits

An expert explained that before adopting blockchain technologies, media will compare different technologies and assess the ratio of the required investment and the possible return on investment. In general, media are more willing to adopt new technologies when competitive pressure forces them:

> Often the problem with technology and media is that technology is expensive, it's an investment, both in equipment and human resources, to adopt technology. So you make an investment without knowing if it's going to pay off in the end. That was the case, for example, when we made a tablet application. But at some point you have no choice because everyone has one. But do we adopt blockchain or any other technology? The media are always going to ask, is this the best place where to put the little money I have, or put my investments. What do I get in return?[42] (interview F49, translated from French)

The obviousness of the return on investment and the direct benefits can be a decisive factor for a news organization's decision to invest in blockchain technologies or not. The Quebec expert continued:

> I think there are always... there are always technological changes that happen that will affect the routine of journalists' work and that's inevitable. It's just that the media will choose the ones that give them the most advantages over the disadvantages [...]. It must return you something interesting. It's got to be worth changing software, going from Mac to PC, from... whatever. Going on Facebook, being on TikTok. It has

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[42] "Souvent le problème avec la technologie et les médias c'est que la technologie coûte cher, c'est des investissements, et en matériel et en ressources humaines, pour adopter la technologie. Donc tu fais un investissement en ne sachant pas trop si ça va te rapporter au bout du compte. Ça a été le cas par exemple parce qu'on s'est fait une application tablet, mais à un moment donné tu n'as pas le choix parce que tout le monde en a une. Mais bon, est-ce qu'on adopte le blockchain ou toute autre technologie? Les médias vont toujours demander est-ce que c'est le meilleur endroit où mettre le peu d'argent que j'ai ou mettre mes investissements. Qu'est-ce que je vais en retirer en retour?"

to be seen as an advantage that outweighs the risks and the costs.[43] (interview F49, translated from French)

Another expert pointed out that if traditional news organizations, as for example the newspapers of the cooperative of GCM in Quebec, are to become interested in the Civil community and self-governance system, the platform has to be accessible at a low cost. These costs do not only comprise pecuniary fees, but also the time invested:

> And asking people to be involved in yet another community which is not delivering direct benefits. If I have to choose between my community, my audience that actually does, you know, support me to a degree, and the Civil community which is not, then I have to spend my time on my audience. So it's just where's the money and where's the return on investment. (interview R37)

One expert noted that blockchain might be a too complex solution, and suggested instead to use easier technology, for example GitHub as a repository for stories and articles: "that would be easier. [...] It can easily be adapted to journalistic content as well"[44] (interview Y25, translated from French). With regard to the funding model, payment methods like PayPal and Interac are in the eyes of a Quebec expert more familiar, straightforward ways for potential donors: "there is always the possibility to

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[43] "Je pense qu'il y a toujours des... il y a toujours des changements technologiques qui surviennent qui vont venir affecter la routine de travail des journalistes puis c'est inévitable. C'est juste que les médias vont choisir ceux qui leur procurent le plus d'avantages par rapport aux désavantages [...]. Il faut que ça rapporte quelque chose d'intéressant. Il faut que ça valle la peine de changer un logiciel, de passer de Mac à PC, de... peu importe. D'aller sur Facebook, être sur TikTok. Il faut qu'on y voit un avantage qui surpasse les risques puis les coûts."

[44] ça serait plus simple. [...] ça peut facilement s'adapter aussi au contenu journalistique."

use PayPal, Interac, all payment systems that are very very easy and super user-friendly"[45] (interview N63, translated from French).

From a business perspective, news organizations prefer technologies that support them in their principal task which is to produce captivating stories (interview F49). Especially artificial intelligence and data journalism which facilitate the work of journalists with additional tools have more chances for large-scale adoption than blockchain technologies whose direct benefits for journalists are not yet sufficiently obvious:

> Newspapers are interested in technologies that will help them get scoops or better stories. If you take data journalism or artificial intelligence, if you get through the Panama Papers with artificial intelligence and then find a perspective or a story in thousands, even millions of pages and then get that story out. Then you're winning. So media are going to adopt technologies like this that allow them to do journalism, to get stories out. So I'm not sure if it's obvious that blockchain could help do that. Maybe, but it doesn't seem obvious to me at first sight. It doesn't cross our minds, whereas with artificial intelligence, we can see it very clearly.[46] (interview F49, translated from French)

Even newsrooms that are working with the Civil platform did not necessarily decide to join the community because of the use of blockchain technologies, but rather due to the current crisis that forces their small and medium-sized newsrooms to

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[45] "Il y a toujours moyens d'utiliser PayPal, Interac, tous des systèmes de paiement qui sont très très faciles puis super convivials."

[46] "Les journaux s'intéressent à des technologies qui vont les aider à avoir des scoops ou des meilleures histoires. Si tu prends le journalisme de données ou l'intelligence artificielle, si tu arrives grâce à l'intelligence artificielle à passer au travers les Panama Papers puis trouver comme un angle ou une histoire dans des milliers, même des millions de pages, puis sortir cette histoire-là. Mais toi tu es gagnant. Donc les médias vont adopter des technologies comme ça qui leur permettent de faire du journalisme, de sortir des histoires. Donc je ne suis pas sûre si c'est évident que la blockchain pourrait aider à faire ça. Peut-être, mais ça ne me semble pas évident de premier abord. Ça ne nous vient pas à l'idée alors que l'intelligence artificielle on le voit très bien."

"experiment with new financing models" and "to work with partners through Civil to explore new models for news" (newsroom testimonies). One American journalist admitted that his newsroom considers "lots of options for continuing on independent and responsible journalism" and that this option "doesn't need to be on the blockchain" (interview L68).

In summary, our interviews revealed five large barriers that could hamper the adoption of the Civil model. In Table 5.3, we provide a synthesis of those barriers.

Table 5.3   Barriers to adoption

Barrier to adoption	Explanation
Technological immaturity and complex token sale	• Failed ICO as negative branding for Civil • ICO as huge user ask with a lot of user friction • Necessity to operate in Web 2.5
The use of a token as a payment method and governance tool	• Layer of complexity deterring people from engaging in the Civil project • Dependence of newsrooms on Civil as a crypto-related company • General association of blockchain with crypto • Small intersection of crypto owners and paying audiences
Legal ambiguities with regard to cryptocurrency	• Cross-national divergences for newsrooms • Complex ICO due to regulatory pressure
Discrepancy between user habits and blockchain characteristics	• Easy-to-click technology as user habit • Blockchain too complex for John Doe • Blockchain as anti-culture
The special relationship between journalism and technology	• Lack of agility with technologies and incapacity to exploit potential • Historical resistance and slow adaptation to digital era • No incentives for media with institutional strength to understand new technologies • Perception of emerging technologies and social media as cause of the crisis • Shift from principal activities to skills unrelated to journalism • Lack of time and low level of persistence for testing new technologies
Imbalance between costs and direct benefits associated with blockchain technologies	• Lack of transparency regarding the benefits of blockchain in journalism vs. related costs • Existence of other, less complex technologies • Preference among journalists for technologies helping to accomplish journalistic core tasks • Blockchain only as one option among others to face the crisis

5.2.2 Incentives for adoption

In addition to those barriers to adoption, our interviewees mentioned several incentives for adoption which we present in the next sections. Three major incentives for adoption stuck out: consumer education (social), improvement of the user experience (technical) and various incentives inside news organizations themselves (economic).

5.2.2.1 Consumer education

Ten out of eleven interviewees emphasized that consumer education is one of the most critical incentives with regard to the adoption of a platform like Civil's. Our interviews helped us to identify three dimensions of consumer education: journalism, Internet and blockchain.

Promoting projects like Civil's requires not only education about blockchain technologies and the new technological paradigm that they introduce, but also about journalism in general and the functioning of the Internet today, including issues related to data protection and fake news:

> It's about educating people about how the Internet works today. As it relates to their data, as it relates to how news but also misinformation spreads. And it's about, you know, the sheer concentration of power in... in how technology and information both flows and is monetized. (interview S51)

As already outlined, readers' willingness to pay for information is in decline. Attracting audiences is not only a problem that is facing Civil, and cannot be explained by an over-technologization of the media:

> So there's no technical barrier to subscribing to a newspaper. All you do is to call them up and you say, I like the newspaper, and they send you a bill. You can even pay in advance, you can pay over time, you can pay monthly, you can pay... however you want to do it, it's that easy, and no matter how easy you make it, people don't subscribe. (interview R37)

In addition to education about the Internet and journalism, blockchain pedagogy can teach people to dissociate the technologies from cryptocurrencies: "the more we talk about blockchain, the more people will disassociate organized crime from blockchain"[47] (interview Y25, translated from French). This proposition contradicts Civil's belief that consumers should not need to know about blockchain technologies and product design, in order not to deter them due to technological depth ("consumers shouldn't need to know much about product design or details at all", interview S51).

First, as outlined by a Civil team member, Civil itself wants to intensify the communication about its value proposition in two directions. First, in view of the ongoing devaluation of information and Civil's finding that people "don't actually know what a journalist does" (interview M30), Civil aims to inform its audiences about the business of journalism in general, the work of a journalist and the costs it implies: "the general subscriber audience, the consumer of news, does not necessarily understand the value of it. So that is why it's our mission, at least on the marketing side, to talk about what this is and how much it costs" (interview M30). Only after that, comprehensible explanations about the value proposition of Civil could attract

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[47] "Plus qu'on parle de la blockchain, plus les gens vont dissocier crime organisé et la blockchain."

potential new community members. For example, one newsroom journalist proposed to publish a document explaining the features and benefits of Civil (interview R37).

Second, Civil wants to establish a more constant many-to-many communication with their newsrooms about the latest activities on the Registry, especially via the two newsletters (the newsletter available to the public and the member-only newsletter called "Civilian"):

> What exactly is going on, how quickly we're growing, all of those stuff. Because people are really interested. It's the way I view what we're doing is that it's an experiment. Who knows if we will fail? The idea is to kind of talk about how the experiment is going and being very transparent about it, how many people are using it, how it actually functions, because if we're not transparent the foundation of this trust layer doesn't have much value, right. (interview M30)

Nevertheless, educating consumers and journalists is not solely the responsibility of Civil. An expert from Quebec had additional ideas. Universities should teach blockchain classes in different faculties, not only in computer science departments (interview N63). Moreover, media themselves can play a pedagogical role. They could for example produce articles, documentaries or explanatory videos about blockchain and crypto:

> It's a bit the role of the media, to make documentaries about the topic, to have informative texts, to have explanatory videos on how the world of blockchain, cryptocurrency or artificial intelligence works. I think for

people those are just buzzwords and it's a bit empty.[48] (interview N63, translated from French)

Table 5.4 is a summary of the propositions listed by our interviewees, illustrated according to the three dimensions.

Table 5.4   Multi-dimensional consumer education

	Ideas for consumer education
Journalism	• explain the profession of a journalist and the related costs • teach the basics of the current crisis • appreciate the value of journalistic work
Internet	• explain the basic functioning of the Internet: (mis-)use of personal data, spread of (mis)information • explain how information is monetized
Blockchain	• learn to accept the new paradigm (blockchain has to be learned) • teach the functioning of a blockchain network • educate about cryptocurrencies • communicate the features and benefits of Civil • explain the purpose of CVL • inform about the activities on the Civil Registry

Another element which is also part of consumer education is the particular case of Civil as a start-up. We did not include it in the table because it does not refer to a concrete pedagogical measure, but only represents an additional consideration for (potential) project participants. One Civil team member explained that Civil is trying to have a long-term vision while at the same time ensuring short-term progress:

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[48] "C'est un peu le rôle des médias, de faire des documentaires là-dessus, d'avoir des textes d'information, d'avoir des vidéos explicatives sur le fonctionnement du monde de la blockchain ou encore des cryptomonnaies ou de l'intelligence artificielle. Je pense que pour les gens ce n'est que des buzzwords et c'est un peu vide."

> You don't inspire ambitious change by being incremental in your thinking, but nevertheless the world changes often incrementally. So we're bringing out how to both be, you know, communicating in long-term vision while also being able to really practically, you know, take a step at the time, towards that, and be comfortable with both. (interview S51)

The interviewee adds that Civil cannot create "overnight success", but consumers have to learn that "big projects take winding paths" (interview S51).

5.2.2.2 Improving the user experience

If consumer education cannot be realized in the short term, changes on the technical side are necessary. To put it in the words of a Civil team member:

> Either you'll learn more about why it takes so long, so the expectations will change or the performance itself will improve. (interview W78)

In a podcast, Matthew Iles pointed out that in addition to consumer education, product design is the second main challenge of Civil (Zomorodi & Poyant, 2018b, 13:58). In our interviews, Civil emphasized that "consumers shouldn't need to know much about product design or details at all" (S51). Also the other interviewees agreed unanimously that a higher level of user-friendliness is a key factor for promoting the adoption of the platform and its tools: "I think that if it's not user-friendly, unfortunately, we won't be able to convince people to get on the train, the blockchain train"[49] (interview N63, translated from French).

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[49] "Je pense que ce n'est pas user-friendly, malheureusement, on ne serait pas capable de convaincre les gens à embarquer dans le train, le train de la blockchain."

As response to the failed token sale, Civil wants to create a "seamless experience" (interview M30) for users which eventually reduces the steps of the token buying process for example the installation of MetaMask, to zero. In order to relieve users of "daisy-chaining together" (interview H12) different applications as it was the case throughout the first token sale, Civil is currently developing and testing tools in order to realize this seamless experience. One of those tools which was explained by a Civil interviewee is the so-called Kirby package. In order to facilitate the understanding of this feature, this paragraph is a summary of the interviewee's explanations as well as Civil's blog posts. The Kirby package is supposed to facilitate instant onboarding and cross-provider interaction (Griffith, 2019). Basically, Kirby is designed as a child i-frame, i.e., a tool allowing to display third-party content on a web page in a new window. When a user loads the Civil web page, an ephemeral "burner" key pair (identity) is automatically created for this user, allowing him to sign attestations and messages (for example as a proof that he has commented on a certain article, etc.). Users then have the possibility to "upgrade" their identity to other providers like MetaMask. In this way, users do not have to create different identities on different websites on their own, but can easily use the ephemeral identity to connect to other Web 3.0 applications. Once the user has upgraded to a more secure identity, he can choose to "burn" the ephemeral key pair. Accordingly, Kirby helps both to build and manage self-sovereign identities (DIDs), and to embed separate applications in the Civil website. The advantage of this approach is that users are more flexible when they choose a wallet (i.e., whether they want to use MetaMask or any other product) because any application can support any wallet (Kinsley, 2019b). Moreover, it will give users the impression to interact with only one single web page, a design which is welcomed by an American journalist and probably a lot of "non-blockchain-savvy" users:

> If it could just be handled in a website – which I know is a very unsophisticated way of looking at it – but from a standard user

perspective, is the way of looking at it. They just wanna come and participate and be part of it. (interview H12)

As already outlined in the section about consumer education, Civil aims furthermore to design the user experience in a way that does not require consumers to understand the technical foundations on the back-end when interacting with the Civil DApp. In the words of a Civil team member, the goal is to "encourage usage by reducing friction" (interview W78). There is a reason for this decision: people nowadays are used to Facebook "where everything is there and everything just works" (interview W78).

In addition, the Civil team members explained us that they are working on new tools which should correspond more accurately to users' needs, for example a story feed that provides smart news recommendations, budget tools, data management tools, audience engagement tools, financial tools, or curation and discovery platforms.

In the next section, we present a summary of the economic incentives for adoption that were mentioned by our interviewees.

5.2.2.3 Economic incentives

〉 Creating a sense of urgency

In addition to social and technical obstacles, established media are not only unaware of the potential benefits of blockchain technologies, but also do not feel the need to

adopt them: "So I have the impression that there is not much appetite to go further"[50] (interview V14, translated from French).

An expert from Quebec noted that when such external pressure (either by consumer needs or progress on the competitors' side) is present, media organizations are willing to accept that they might not have an obvious benefit from the adoption, or make a profit with the technology:

> But at some point you reach a point where you have no choice on social media to reach your audience. Because it's migrated to these platforms. So you're forced to go there even if you don't make a cent from being there [...] Probably you get less money for it than you spend to be there, but you have no choice because everyone is there.[51] (interview F49, translated from French)

The interviewee named the introduction of a tablet app as an example; since all competitors had adopted the new technology, other newspapers saw themselves obliged to follow suit. As a first impetus, the institutionalization of cryptocurrencies, i.e., the use of crypto by banks, will have a huge impact on the sense of urgency on the part of news organizations, as an expert in Quebec remarked. The person drew a comparison to Interac and online payment:

> I think it will depend on whether banks follow suit and then it becomes more mainstream. No industry including the media will have the choice to follow. Because it's going to be like Interac or online payment. The media

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[50] "Donc j'ai l'impression qu'il n'y a pas beaucoup d'appétit pour aller plus loin."

[51] "Mais à un moment donné tu arrives à un point où tu n'as pas le choix sur les médias sociaux pour joindre ton audience. Parce qu'il a migré sur ces plateformes-là. Donc tu es obligé d'y aller même si tu n'en engranger pas une cent du fait d'y être [...] Probablement ça te rapporte moins que ce que tu dépenses pour y être, mais tu n'as pas le choix parce que tout le monde y est."

had had to adapt to online payment as well.[52] (interview F49, translated from French)

⟩   Promoting the project through diverse role models

A striking finding of our analysis is that the Quebec experts emphasized the role of the government with regard to the promotion of blockchain and cryptocurrencies. According to the experts, the government should take on a leading role with regard to blockchain and technology: "governments become much more technophile and implicated"[53] (interview V14, translated from French). Moreover, they should invest in R&D: "Perhaps the government should invest more in research and development to make it much better known to the industry in particular"[54] (interview N63, translated from French). Another incentive could be to offer all types of media tax credits tied to the condition that they invest a certain amount of money in innovative technologies:

> Maybe tax credits like in the video game industry, as I said, government assistance could be made conditional on significant digital shifts being made, blockchain, AI, crowdfunding, philanthropy, all of that. So maybe the government could give tax incentives, and tax credits to help the journalism industry and the media in general.[55] (interview N63, translated from French).

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[52] "Je pense que ça va dépendre si les banques emboîtent le pas puis ça devient plus mainstream. Aucune industrie incluant les médias n'auront le choix de suivre. Parce que ça va devenir comme Interac ou le paiement en ligne. Les médias ont dû s'adapter au paiement en ligne aussi."

[53] "Les gouvernements deviennent beaucoup plus technophiles et beaucoup plus impliqués."

[54] "Il faudrait peut-être que le gouvernement investisse davantage dans la recherche et développement pour que tout ça soit beaucoup plus connu de l'industrie en particulier."

[55] "Peut-être des crédits d'impôts comme dans le domaine du jeu vidéo, comme j'ai dit, l'aide du gouvernement pourrait être conditionnel à ce qu'il y a des virages numériques importants qui soient faits, blockchain, AI, crowdfunding, philanthropie, tout ça. Donc peut-être que le gouvernement pourrait donner des incitatifs fiscaux, et des crédits d'impôt pour aider l'industrie journalistique et des médias en général."

In addition to governments, key players in the journalism industry can be role models, too. In order to drive the adoption of blockchain technologies forward, our interviewees in Quebec proposed that well-known newspapers like Le Devoir and Radio Canada take the lead.

Nevertheless, role models are not necessarily limited to the journalism industry, but can include actors from sectors that are related to the media, like social networks. An American journalist explained that if Facebook is able to roll out its cryptocurrency Libra, for example, cryptocurrencies could lose their horror:

> The value is that cryptocurrency could – I'm not gonna say will – but it certainly could become more mainstream as big players, and I hate to say this, but as big players like Facebook roll out their own. [...] As larger players, if Apple or Twitter would roll out a cryptocurrency on their own, then it would become more mainstream. And then it wouldn't be so scary. (interview R37)

⟩ Experimenting with blockchain in side projects

With regard to blockchain technologies, one expert told us that news organizations (in Quebec) will be more likely to experiment with the Civil project than to create their own blockchain network: "in the current state of the journalistic community, no, [...] I don't see anybody starting their own platform"[56] (interview Y25, translated from French). Nevertheless, pilot projects are required to explore the promises and risks of the Civil platform, and to demonstrate news organizations its potential value added: "There should be pilot projects that work. For example, if Civilian can do something

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[56] "dans l'état actuel de la communauté journalistique, non, [...] je ne vois personne qui démarrerait sa propre plateforme."

that works and then show that there have been real benefits."[57] (interview F49, translated from French). Therefore, the experiment should be managed as a side project that does not have any impact on the daily business:

> If I were a media owner, I would experiment on this platform to discover the benefits or problems. But I would... I would make sure that it wouldn't be at the expense of all my other activities and the foundation of my business and the strength of my business.[58] (interview V14, translated from French)

According to an American journalist, media companies should also observe other players and keep track of similar ongoing ventures:

> The organization that's going to succeed is the organization that is truly looking at all the innovation that's going on outside of itself. [...] They have to be looking at all the other initiatives that are going on because it's not gonna happen... You have to be the Amazon dot com of blockchain. And the only way to do that is to be seeing everything and keeping up with everything. (interview R37)

Once the side project is in place, becoming the "Amazon of blockchain" also requires a savvy marketing strategy, promotion, advertising, and word of mouth (interview V14). To say it with the words of the American journalist: "it's gotta come hot" (interview R37).

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[57] "Il faudrait qu'il y a des projets pilotes qui fonctionnent. Par exemple si Civil arrive à faire quelque chose qui fonctionne puis à montrer qu'il y a eu des réels avantages."

[58] "Moi si j'étais propriétaire d'un média, j'expérimenterais sur cette plateforme-là pour en découvrir les bénéfices ou les problèmes. Mais je ferais... je m'assurerais que ce n'est pas au détriment de toutes mes autres activités puis de la base de mon entreprise puis de la solidité de mon entreprise."

〉 Pooling diverse skills in one project

The Quebec experts pointed out that news organizations have to group people with different professional backgrounds in the blockchain side project. In general, media already have employees with necessary technical skills: "all media now have teams of computer scientists, coders, web designers, et cetera"[59] (interview F49, translated from French). In addition to those specialists, specialized lawyers ("there are certain lawyers who are specialized in media law"[60], interview F49, translated from French) and external consultants ("most people don't understand it, so it would take external consultants to help"[61], interview N63, translated from French) could be necessary to assist with subject-specific issues.

〉 Encouraging audience engagement through token rewards

So far, we discussed economic incentives rather from a macro perspective, i.e., how media as organizations can approach the adoption of blockchain technologies. In addition to those incentives, both Quebec experts and American journalists proposed several concrete approaches how readers and journalists can be incentivized to work with the Civil platform inside the pilot project.

The most striking way to leverage existing economic incentive structures is to incentivize quality reader engagement through token rewards (interview L68 and R37). This section is a summary of the ideas of interviewee L68 and R37, both

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[59] "Tous les médias maintenant ont des équipes d'informaticiens, de codeurs, de web designers."

[60] "Il y a certains avocats qui sont spécialisés en droit médiatique."

[61] "La plupart des gens ne comprennent pas ça, donc ça prendrait des consultants externes pour aider."

American newsroom contributors. Whenever a user shows a reaction to news content (visiting the newsroom's website, reading, reacting with thumbs up, commenting, giving advice, sharing, etc.) or makes a significant contribution to the self-governance system (challenge, appeal, vote), he or she is paid in tokens which could then be used for accessing premium content of any newsroom of the Civil community for free. In order to overcome the challenges of mistrust in crypto as well as the resistance to blockchain, partnerships with companies outside the media ecosystem are also possible (interview R37). The token rewards would then serve as vouchers which could be redeemed at conventional shops. This citation summarizes well the core idea of reader engagement through token rewards:

> So if you gave me 5 bucks a month, I will actually listen to the full interview with this musician, artist, whatever. So if you had... it's set up such that people get paid to read the articles in tokens, that they can convert into, that they can use to watch premium content or read premium content, then conceivably blockchain could help create a larger audience. But again, people want something for free. You have to figure out, how do you give them something for free that doesn't cost you much. (interview R37)

Furthermore, readers should be given the possibility to suggest journalistic projects in their coverage area, or about events that they are personally concerned of what can incentivize journalists to cover the story: "that's probably a pretty good incentive for the writer to take up that and do something that the community wants and then those share it and help make this" (interview L68). A further incentive could be the possibility to delegate "votes" about a project to a trusted person (interview L68).

Another idea which can increase the impact of the content, reach a broader audience and favor cross-media promotion is to develop an embedded news wire (interview R37) for newsrooms of the Civil community, enabling journalists to load their stories on the websites of other newsrooms:

> Like not copying and pasting, or not taking the file and loading it on to their own site, somebody else's. But literally having a... example like if it's a WordPress app that creates like a dip frame. Basically a frame is that my page loads in somebody else's website so that I get the hits. (interview R37)

Still highly hypothetical, a combination of all those suggestions could create an inverted business model, as one Quebec expert remarked: instead of asking users to pay for news, they are rewarded for their engagement. If the journalism industry is then also able to reallocate the value from the GAFAM back to media by means of blockchain technologies, it is conceivable that news organizations have the financial capacity to cover those rewards and lower prices for membership and subscription:

> If the blockchain allows to capture the wealth where it is, again in the billions that the web giants make − the media is better funded that way, but then maybe people don't need to contribute from their own pockets for projects. There's going to be... if the money... if the wealth is better distributed in advance with the other mechanism that we talked about earlier, maybe there will be less need for people to finance themselves, to pay themselves just to get information.[62] (interview Y25, translated from French)

⟩ Targeting the business model of Facebook

Our findings revealed that all our interviewees associated the term disruption in journalism with social media in general and Facebook in particular. A Quebec expert explained that it is essential to restore the model in favor of traditional media, instead of disrupting it:

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[62] "Si la blockchain permet d'aller capter la richesse là où elle se trouve, encore une fois dans des milliards que font les géants du web, les médias sont mieux financés comme ça, mais là peut-être les gens ont moins besoin de contribuer de leurs poches pour des projets. Il va y avoir... si l'argent... si la richesse est mieux répartie à l'avance avec l'autre mécanisme qu'on a parlé antérieurement, peut-être qu'il y aura moins besoin pour les gens de financer eux-mêmes, payer eux-mêmes simplement pour s'informer."

I have the impression that disruption has already happened. It was social media and the big multinational companies behind it. [...] I think there's a contradiction between *disruptive* and *restore*. We want to break something, but we also want to fix it. [...] So that's why I'd see it less as disruptive but more as restoring in a certain sense. [...] "The business model is broken", I don't agree because Facebook, they're using the same business model. Facebook just sells ads. [...] We get people's attention, with likes and stuff, and we sell ads. Point. It's the same old business model that's just better adapted to today's mobile environment.[63] (interview Y25, translated from French)

An American journalist described the potential disruption by blockchain as "moving past the Facebook distribution model" (interview L68). Nevertheless, the person pointed out the discrepancy between the operating paradigms of blockchain technologies and social media, especially with regard to disintermediation and openness:

And one of the things about cryptocurrency is that it's open, it's... in a way, it's permissionless. That's a tremendous benefit. You don't have to ask a gatekeeper authority like Facebook for permission to start a blockchain newsroom for your blog. [...] You got to know what the rules are. And you can't know what the rules are on Facebook because Facebook will never tell you the rules. (interview L68)

Taking into account the last two remarks, blockchain-based news platforms could target the Facebook model and create a counterbalance to the "walled garden" (interview L68) of Facebook, for example by introducing the inverted business model:

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[63] "J'ai l'impression moi la disruption est déjà arrivée. Ça a été les médias sociaux puis les grandes entreprises multinationales derrière. Je trouve qu'il y a une contradiction entre "disruptive" et "restore". On veut briser, mais on veut aussi réparer. [...] Donc c'est pour ça que je verrai ça moins comme "disruptive" mais plus réparateur dans un sens. [...] "Le modèle d'affaires est brisé", je ne suis pas d'accord parce que Facebook, il reprend le même modèle d'affaires. Facebook vend juste de la publicité. [...] On attire l'attention des gens, avec des likes et tout, et on vend de la pub. Point. C'est le même bon vieux modèle d'affaires qui est juste mieux adapté à l'environnement actuel mobile maintenant."

> I think that if readers get paid in tokens to read stories and share stories and comment on stories, then that will be hugely disruptive because then it will pull them away from Facebook and it'll push them back into the newspaper. (interview R37)

As already noted, all presented economic incentives in this section address mainly bigger news organizations. In the next section, we outline why according to our interviewees, both big and small media can benefit from blockchain-based news platforms.

5.2.2.4   The experience with Civil for different types of media

At the moment, the Civil community consists of small and mid-sized newsrooms, and the recruitment strategy is based on capacity and the professional networks of the Civil team (interview J94). Civil's initial intention was to create a community for those newsrooms who "need help more than the big guys" instead of building an "industry coalition" for larger industry players (interview S51). The reason for the focus on this type of media is that the access to a wider community and blockchain tools is "something that's not available to independent start-ups in media" right now (interview L68). However, Civil wants break up this "strategy of least resistance" (interview S51) and extend the community with "newsrooms from across the spectrum" (interview M30) by attracting bigger players as well, thereby corresponding to the viewpoint of two Quebec experts who believe that big players should not be excluded from the community. From an economic perspective, they might even be more apt to adopt blockchain technologies since they have more financial resources to invest in R&D, and more economic stability to experiment with blockchain technologies than small media:

"So it has to be extended to big media, which have a lot more money and a lot more budget for R&D. [...] The platform has to be for everyone. Not just for the small and mid-sized, the big have to be there as well if they want to. We can't exclude them. That's a bad approach, in my opinion, to exclude them."[64] (interview N63, translated from French)

Our interviews revealed that brands still play an important role in journalism. A Civil team member put it, "people trust The New York Times because it is The New York Times" (interview S51).

The focus of audiences on brands is also the reason why Civil rejected its initial plan to work exclusively with small and medium-sized newsrooms:

Now we've been trying to find ways to engage with larger news organizations in part because they're gonna help to broaden our credibility and our reach and our awareness and obviously access to people. (interview S51)

However, one hurdle of this venture could be that large news organizations currently have no visible benefit from an affiliation with Civil, as an American journalist noted (interview H12). Therefore, newspapers like the New York Times would still be "certainly years away" (interview H12) from a partnership with Civil. The American interviewee noted that an incentive for established media to participate in the Civil project would be a larger community which could then grow organically:

I mean what are their incentives for getting involved with something like Civil. Right now, the New York Times is way bigger and more influential than Civil. [...] And so I think that requires a lot more newsrooms, I think

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[64] "Donc il faut élargir ça aux grands médias qui eux, ont beaucoup plus d'argent, puis ont beaucoup plus de budget pour le R&D, recherche et développement. [...] Il faut que la plateforme soit pour tout le monde. Pas juste les petits, les moyens, il faut que les grands soient là-dedans aussi s'ils veulent. Il ne faut pas les exclure. Ça c'est une mauvaise approche selon moi, de les exclure."

that requires larger newsrooms. And if Civil is successful that will happen organically. There will be more newsrooms coming in overtime as Civil increases its profile, then newsrooms coming in will be larger and better known. But slowly, and incrementally. (interview H12)

One Quebec expert and one American journalist were optimistic that mainstream adoption could break through in three to five years. The Quebec expert even went on to say that media make a serious mistake if they do not invest in blockchain technology in the next years:

I just think that the Quebec media are making a serious mistake if they don't get on board of the blockchain train in the next 3, 5 years. That they're really going to miss the boat, so to speak.[65] (interview N63, translated from French)

The expert justifies his claim with the precarious situation of journalism, larded with risks that could even threaten its existence: "But in ten years from now, what will be left as media?"[66] (interview N63, translated from French). In line with this viewpoint, also the newsroom testimonies show that the newsrooms joined the Civil project because they expect a change of direction from Civil. Some newsrooms see Civil as a new way forward by stating, "Journalism needs a new path forward" and "I want to be part of the solution moving forward". Two other newsrooms explained that they participate in the Civil project "because navigating these changes is better with the right community, tools and opportunities that Civil promises" and "because I saw a start-up with huge potential for growth and a revolutionary approach to journalism" (newsroom testimonies).

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[65] "Je pense juste que les médias québécois font une grave erreur s'ils n'embarquent pas dans le train de la blockchain dans les 3, 5 prochaines années. Qu'il vont vraiment avoir manqué le bateau comme on dit."

[66] "Mais dans 10 ans, qu'est-ce qui va rester comme médias?"

In contrast, some other interviewees are rather skeptical with regard to the notion of disruption, arguing that there are currently no indicators suggesting that blockchain-based news platforms would disrupt the journalism industry at large: "I'm not seeing anything happening that would indicate that that's about to be the case" (interview H12), or that such a scenario per se is "utopian" (interview Y25) and "idealistic" (interview N63).

Another Quebec expert has a more moderate credo, suggesting that promises and challenges should be weighed up carefully:

> And when we say disruptive, it can be disruptive for the better, but it can also be disruptive for the worse. [...] We've seen a lot of things in history that seemed like good ideas that never... that never got anywhere. [...] We can see positive developments, we can see some that have little use, and then we can see some that are really not for the better.[67] (interview V14, translated from French)

Table 5.5 provides a summary of all identified incentives for adoption. With these findings in mind, we discuss in the next chapter the results from our case study and how they can contribute to academia and practice.

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[67] "Puis quand on dit perturbateur ça peut être perturbateur pour aller vers mieux, mais ça peut aller aussi, pour aller vers pire. [...] puis on a vu quand même dans l'histoire pleines de choses qui semblaient être des bonnes idées qui n'ont jamais... qui ne sont jamais arrivées à rien. [...] On est capable de voir des développements positifs, on est capable d'en voir qui ne donnent pas grande chose puis on est capable d'en voir qui sont vraiment pas pour le mieux."

Table 5.5   Incentives for adoption

Incentive for adoption	Explanation
Consumer education	• Multi-dimensionality: education about journalism, the Internet and blockchain technologies
Improving the user experience	• Increase user-friendliness and create a seamless experience by reducing additional steps (e.g. Kirby package)
Economic incentives	
Creating a sense of urgency	• Adoption will depend on competitive pressure • Institutionalize crypto; acceptance by banks
Promoting the project through diverse role models	• Role of government: test blockchain, invest in R&D, offer tax credits • Radio Canada or Le Devoir as leaders • Facebook as early adopter?
Experimenting with blockchain in side projects	• Pilot projects like Civil are necessary to demonstrate benefits • Test blockchain without threatening core business • Keep up with innovation outside own business
Pooling diverse skills in one project	• IT experts, media lawyers, external consultants
Encouraging audience engagement through token rewards	• Pay audiences in tokens for significant contributions (comments, feedback, suggestions, participation in governance system, etc.) • Link rewards to premium content, lower subscription fees, vouchers • Inverted business model: pay audiences instead of making them pay
Targeting the business model of Facebook	• Restore the model which has been "stolen" by Facebook • Create a counterbalance to the Facebook model

CHAPTER VI

DISCUSSION

Based on the results from our case study, we explore in this chapter to which extent blockchain technologies and the Civil model could disrupt the journalism industry, by carefully distinguishing between the blockchain-enhanced tools and features that could be realized without blockchain.

The discussion is structured in seven parts. First, we turn back to our main research question: how could the use and functioning of blockchain technologies potentially disrupt (parts of) the journalism industry? As our interviews demonstrate, this question cannot be answered unambiguously. Instead, the theory of disruptive innovation applied to journalism is a multilayered phenomenon that has to be discussed controversially. In order to avoid a merely techno-deterministic or socio-deterministic perspective on our research question, we present in this section factors emerging from our interviews which both 1) support and 2) refute the thesis that blockchain has a disruptive potential for the journalism industry. This controversial discussion addresses notably players in the journalism industry: it allows journalists, editors and managers in small and large news organizations alike to get an overview about how blockchain could/could not have a disruptive potential on their business. In addition, it can help blockchain practitioners to expand the portfolio of blockchain applications to journalism.

First, we discuss four factors which favor the disruptive potential because they correspond to main characteristics of disruptive innovations:

- Civil offers new models for journalism, notably self-governance and tokenomics;
- Media face an innovator's dilemma with regard to blockchain technologies;
- Blockchain does not correspond to user habits and needs;
- Journalists and readers do not feel the need to adopt blockchain.

Subsequently, we outline three factors which refute blockchain's disruptive potential. Those are:

- Blockchain faces competition from other tools and technologies;
- Blockchain technologies cannot replace existing models in journalism;
- Intermediaries and centralized control are not taken out of the equation.

Based on all those factors, we then present what we refer to as the *Disruption of the Stolen Model*. We suggest the possibility that this kind of disruption could be a response of news organizations to the disruption by social media. By deploying blockchain-based news platforms like Civil's, media could develop an alternative business model and hence disrupt Facebook & Co. who have adapted the traditional news business model. However, before the *Disruption of the Stolen Model* can become a conceivable concept for the whole journalism industry, it is essential to analyze the implementation of blockchain technologies and models on a business level. In section 6.4, we hence propose several ideas how news organizations could implement blockchain in their business by focusing on possible approaches for blockchain adoption (adoption of blockchain technologies and tools) and business model adaptation (reconfiguration of the news business model by implementing the

two blockchain-based business model elements self-governance and tokenomics as developed by Civil). We first resume the six economic incentives mentioned by our interviewees in chapter 5 and explain the effects they could have on the adoption of blockchain in news organizations. Those effects are: experience curves, network effects and demand discovery. In a next step, we discuss four strategic reflections on how media companies could realize these incentives and effects.

Subsequently, in order to emphasize the complexity of implementing blockchain technologies in journalistic practice, we highlight in section 6.5 a phenomenon that we call *user socio-technical dilemma*, describing the gap between social habits of users and technological reality. A social and technological paradigm shift which could address this dilemma is discussed in section 6.6. Last but not least, we summarize in section 6.7 the contribution of our case study to academia and business practice.

6.1   Factors favoring the disruptive potential of blockchain in journalism

6.1.1   Civil offers new models for journalism

First and foremost, the most evident factor supporting the thesis that blockchain technologies could disrupt the journalism industry is Civil's introduction of new models. This finding is crucial since we have shown in the literature review that the traditional business model of journalism is obsolete and vice versa "new disruptive technologies might ultimately require new business models" (Cozzolino et al., 2018, p. 1194).

In this section, we examine more in detail the two features self-governance (social and technical governance model) and tokenomics (funding model with micropayments and token rewards) because they seem to provide tangible alternatives for the current media business model. Other blockchain-specific applications like permanent archiving, smart contracts or DIDs for copyright protection or licensing are not discussed here since they present tools that can have an impact on the workflow, but – at least at their current stage of development – not necessarily on the news business model as a whole. However, they can be built upon the blockchain-based business model.

The blockchain-based business model elements could provide the management of incumbent media organizations as well as leading teams of small media outlets with new ideas how blockchain might be implemented in their traditional business model.

6.1.1.1   Self-governance

The self-governance system, consisting of social and technical governance, offers a disruptive potential inasmuch as it involves journalists and audiences alike and creates decentralized, disintermediated and horizontal decision-making processes with fixed rules and hence a basis for reliable and community-approved content. The interviews imply that one of the most promising and disruptive characteristics of the self-governance system is its ability to restore trust; as pointed out in chapter 2, loss of trust is currently one of the biggest challenges for news organizations. Moreover, in view of the ongoing concentration of ownership and power in media, community governance on the Civil platform is valuable because it could create a counterbalance to institutionalized journalism, as one Quebec expert noticed. Despite its potential, it is essential to note in advance that both the social and the self-governance model in

its basic form could also be realized without blockchain technologies. We come back to this particularity in the end of the section where we explain how Civil's self-governance concept is different from non-blockchain self-governance mechanisms.

The design of the self-governance mechanism as a "very formal process" (interview J94) could help to meet the expectations of the readership by providing an additional criterion to existing checks-and-balances (e.g. editors) to assess the quality of information. This feature is already implemented and appreciated by the Civil newsrooms. According to a study from the Gallup/Knight Foundation, principle journalistic standards like transparency as well as the speed and openness with which "an organization corrects mistakes and how carefully it evaluates facts before reporting" are decisive for the trust level US citizens develop towards media (Gallup/Knight Foundation, 2018b, p. 18). Also Canadian citizens are careful when assessing the veracity of news content (Brin et al., 2019, pp. 4-5). What is more, if the community reaches a critical size, newsrooms without the Civil stamp of trust could be seen as less trustworthy. The Wikipedia model of the Civil platform can furthermore contribute to the re-establishment of trust, as evidence from research suggests. A German study about the characteristics of different media formats and reasons for using them revealed that readers perceived Wikipedia almost as objective and credible as newspaper websites; with respect to independence and transparency, it ranked even higher (Neuberger, 2014, pp. 249-250). Last but not least, involving different perspectives of a story provided by the diverse community can be an important factor to restore trust levels (Newman et al., 2018, p. 18).

Despite the strengths of horizontal, collective co-construction, it is highly questionable if the small Civilian group participating in the vetting process and discussion forum is really representative for a greater audience. To cite academia, journalism scholar Karin Wahl-Jorgensen, for example, points out that "[...]

individual participating in discussion through such venues are not necessarily reflective of the profile or views of a broader public" (Wahl-Jorgensen, 2014, p. 276). Taking this statement into account, it can be speculated if the "1% rule" explained by Vivian Schiller is merely a justification of a lack of interest and engagement among the Civil members. Following the term *audience fatigue* introduced in the literature review which is resulting from external factors like information overload, we call the phenomenon of intrinsic inactivity of news consumers *audience idleness*. However, if alternative models in journalism like Civil's are to become viable options in the future, the role and behavior of the reader will have to change – a development that is currently in contradiction with the risk of social resistance regarding blockchain technologies, as identified in chapter 2. Considering John Pavlik's remark, "At no time is this [audience engagement] more apparent or perhaps more urgently needed than during times of crisis" (2013, p. 185), one of Civil's major challenges will represent the attraction of readers to the platform.

The open and flexible design of the self-governance mechanism is not only supposed to encourage users to participate in the quality assurance of journalistic content, but also to contribute to the development of the framework of functioning of the platform (Flichy, 2003, p. 139). The communities of social (newsroom community) and technical self-governance (developer community) melt together on Civil's discussion forum. Especially in the beginning of a project like Civil's, communication and interaction on forums in the sense of Flichy (see chapter 3) can be valuable. By combining social and technical self-governance, Civil realizes in part what media critic McChesney ascribes to politics: the responsibility to deploy technological resources in order to create a decentralized, non-profit, non-commercial, responsible sector which provides the whole population with a viable service (Chomsky & McChesney, 2004, p. 189).

Taken together, the Civil platform has the potential to become what Macnamara refers to as an "autopoiesis", "a self-organizing capability which, in many cases, leads to emergent properties" (2014, p. 290). These emergent properties of social and technical self-governance form a construct that could be seen as a common good. A common pool resource (CPR), as defined by Elinor Ostrom in 1990, is "a natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use" (Ostrom, 2015, p. 30). Since its introduction, Ostrom's theory of the commons has contributed to research about the organization and the governance of big common projects involving different actors and goods. has ever since resulted in a range of studies in different disciplines. Whereas Ostrom initially conceived the concept of CPRs for natural settings like fishing, forestry, water resources, etc. (Hess & Ostrom, 2007, p. 4) as an alternative to private and public institutions (Ostrom, 2010, p. 2), she steadily continued to develop her theory. In 2007, two years before winning the Nobel Prize in Economics, she extended the commons approach to *knowledge* as a response to the increase in information and the advent of the digital era.

We present the possibility to conceive Civil as a commons because the platform already indicates some main characteristics of a common good. Furthermore, in view of current developments which we presented in the previous chapters – especially challenges like increasing concentration in media ownership, the growing power of the GAFAM and social polarization – designing Civil as a commons could perhaps be an alternative construct to merely privately-owned or merely public service media. Interviewee W78 and Y25 emphasized the need to create journalism as a public service or public good; the European Federation of Journalists agrees that journalism itself can inherently be seen as a common good that has to be preserved (Bittner, 2019, p. 18). Accordingly, a blockchain-based commons-oriented news platform could be susceptible to create a new form of journalism involving journalists and

audiences alike, providing clear and equal rules for all participants, limiting dependence on third parties like Google or Facebook and increasing direct interaction and hence trust levels. Even if these reflections might still seem idealistic, we show in Table 6.1 that seven of Ostrom's eight design principles – later also described as "best practices" (Ostrom, 2010, p. 13) – can be found on the Civil platform which characterize successful commons (the last principle only applies to commons in larger systems). This first comparison shows that the platform's properties correspond to the characteristics identified by Ostrom.

Table 6.1   Design principles of the Civil platform

Design principle	Civil
Clearly defined boundaries	Waterline separating Civil members (token holders) from pure readers
Congruence between appropriation and provision rules and local conditions	Standards of the platform are set according to conditions in the US: • journalistic (press freedom); • technical (existence on the Internet); • legal (CVL accepted as an official cryptocurrency)
Collective-choice arrangements	Community can propose modifications (of Constitution, parameters, code)
Monitoring	Council (internal monitoring); SEC (external monitoring)
Graduated sanctions	Multi-step vetting process: Challenge, appeal, challenge of the appeal, rejection on Registry, loss of CVL deposit and listing as rejected newsroom
Conflict-resolution mechanisms	Community can participate in the vetting process and in discussions on the Civil Discourse and Slack
Minimal recognition of rights to organize	Civil newsrooms accept the Civil rules by signing the Constitution; Civil is an alternative, but legitimate platform inside the global journalism ecosystem; CVL is subject to the SEC and accepted as a consumer token

Based on Ostrom, 2015, p. 90

It has to be noted that the basics of the self-governance system, especially the vetting process, were developed by Civil itself and not by the community. Imposing basic governance rules can be justified in the beginning of a project, but for the rules to be effective, the long-term principles have to emerge from the community itself (Ostrom in Smith, 2020, 23:25 - 24:05). Civil is heading in this direction by aiming to introduce complete community governance in the near future. However, it can be argued that the Civil platform is not yet a commons because the Civil community – in

the words of Ostrom – is not "sufficiently large". The insufficient size stems from the fact that the Civil community which comprises 70 rather unknown, small and mid-sized newsrooms in 2019 cannot have a significant impact on the global journalism ecosystem: most journalism still takes place outside Civil and the blockchain network. As interviewee L68 pointed out, there is not yet a "critical mass" of journalists engaged in the Civil project and its tools. Therefore, especially a larger community and further testing of the platform will be necessary to prove if the concept of the commons really holds true for Civil; Table 6.1 provides hence a starting point for future research.

As mentioned in the beginning of the section, one has to be careful when defining the self-governance model as a disruptive element of blockchain-based models for journalism: self-governed communities, for example in the form of commons, can also be implemented without blockchain technologies. The blockchain-specific disruptive potential of Civil's governance model becomes apparent when combining it with other blockchain features like smart contracts and permanent archiving. Automating the whole vetting process with smart contracts (which calculate and trigger token rewards, for example) and storing the vetting history with the DIDs of the actors (DIDs are under development) in an immutable manner on the Ethereum blockchain provides special robustness to the voting mechanism and adds a new, possibly disruptive dimension to self-governance models in journalism. Moreover, the crypto-economic model, also called tokenomics, allows to operationalize the social self-governance model by means of granular token stakes and rewards which are free of transaction costs, independent from third parties and directly linked to the Ethereum blockchain. If tokenomics is also implemented in the technical self-governance model, Civil's governance mechanisms will be truly blockchain-enhanced disruptive elements for journalism.

In the next paragraph, we discuss tokenomics by exploring ways to incentivize crypto donations and quality reader participation which together could build the basis for a new pillar of the media funding model.

6.1.1.2 Tokenomics

Tokenomics can introduce disruptive features in the journalism industry. We identify three such features. First, granular crypto donations in the form of micropayments and crypto fundraising tools like Civil Boost can be added to the traditional funding model, as explored in the last chapters.

Second, the Civil platform uses the CVL token as a member card to the Civil community and as a means to participate in the self-governance system. By designing CVL as a consumer token, speculators and fraudsters are kept out of the network, control is given back to users (Howle, 2018) and self-governance is carried out within clear boundaries. This is also the reason for the setting of a soft cap: Matthew Iles explained that the company did not need $8 million to realize the project, but to ensure that there is a large enough community avoiding that single persons or entities acquire a large part of the platform (Zomorodi & Poyant, 2018d, 23:53). From the perspective of Ostrom's theory, the effort required to buy CVL tokens represents the cost which can exclude potential beneficiaries from the Civil network.

Third, our interviews revealed that token rewards represent another element of the token model which eventually could increase the Civil community, fuel the self-governance system and thus turn out to be a disruptive supplement to the existing funding model. Reader engagement through token rewards does not yet exist on the Civil platform. However, similar models in other applications can be found in

practice. For example, we already mentioned the Brave Browser which offers two distinct, but closely related features. First, users can support content creators (i.e., creators of websites) by allowing Brave to send the creators a specific amount of the Basic Attention Token based on the user's attention to visit the website. This attention is measured and calculated by Brave, preserving the privacy and anonymity of the user. Users can choose which websites they want to support, and they have also the possibility to tip content creators directly. Second, users are rewarded for viewing ads according to the parameters they set up (type, form, frequency of ads), hence earning a significant amount of ad revenue that normally goes directly from advertisers to platform providers (in this case, Brave).

If such a model was implemented by Civil, it would be imaginable to realize the inverted business model that was proposed by one of the Quebec experts: while audiences would donate CVL to their favorite journalists (in the form of attention or tips, e.g. the Civil Boosts), they could earn CVL by reading, sharing, liking or commenting stories. If this model then took off at a large scale because token economies can help to get networks off the ground more easily (Zomorodi & Poyant, 2018a, 12:55), news consumers and journalists alike would benefit (in terms of money, content quality and trust), avoiding newsrooms to ask for audience support and audiences to be merely passive consumers. Especially the inverted business model illustrates to which extent tokenomics provides different incentive mechanisms than existing models or communities driven by fiat currencies: increasing participation of the Civil platform can 1) increase the value of the token and thus of the individual journalistic contributions; 2) these contributions could be stored in identity hubs by linking them to the DID of the news consumer or journalist. Keeping an immutable record of individual contributions might have reputational effects, possibly leading to soaring participation. If implemented on the Civil platform, tokenization (the attribution of a fixed value to an asset) could furthermore

consolidate the disruptive potential of tokenomics for journalism by valorizing journalistic content and hence reinforcing the reputational effects.

Despite these three disruptive promises of tokens, the token model also has some pitfalls. The statements of our interviewees suggest that the highest barrier to the integration of a token in the news business model (in the form of a payment method, governance tool or reward mechanism), is the mistrust of people in cryptocurrencies and their fear of engaging in an unknown, complex process (an illustrative example of social resistance). However, in order to unlock the disruptive potential of the above mentioned features, a larger community will be necessary. An important number of community members can compensate for small granular donations, make the Civil stamp of trust valuable and incentivize others to join, hence increasing the value of the token and potential token rewards. Moreover, the subjunctive of the previous paragraphs demonstrates that blockchain applications, among them Civil, are not yet fully developed to unfold the potential of tokenomics, reflecting the global technological immaturity of blockchain technologies, as identified in chapter 2.

In addition, we can observe a gap between the law, the reality of crypto and people's fears, proving the legal shortcomings of blockchain technologies. As mentioned by an expert, legislators often do not keep pace with technological developments, as the incomplete regulation of the Internet demonstrates. Flichy's theory shows that "old" socio-technical frameworks are often only codified by law when a "new" framework already appears (Flichy, 2003, p. 218). In this context, the role of the US law as the "watermark" (interview S51) for the regulation of CVL is ambiguous: on the one hand, it helps to ensure that Civil is operating inside the legal framework, while on the other hand, its rigor can impede newsrooms from abroad to join the Civil project, and creates a dependence on the decisions made by the SEC. If the Civil model is to be implemented in media organizations in other countries, for example in Canada or

Quebec, an alternative approach to completely new regulation of crypto could be sandboxing, a widely used concept in computer security where the test environment is isolated from the core system. In the context of blockchain, the approach provides "a legally safe environment (often through some regulatory exemptions) for blockchain developers to test their products", allowing them to be "implemented on a controlled scale for a limited period of time and under close supervision" (OECD, 2018, p. 20). Even if sandboxing is so far especially applied in the blockchain sector of financial technology (fintech), such an approach might also be viable for Civil and the journalism industry: the Canadian Securities Administrators which launched a sandbox initiative in 2017 explained that the project addresses business models "that are truly innovative from a Canadian market perspective" (CSA, 2017).

To summarize the first factor that favors the disruptiveness of blockchain in journalism, we argue that the Civil models self-governance and tokenomics are both characterized by disruptive elements, but still require further refinement if the disruptive potential is to be unfolded. From a conceptual point of view, Flichy explains that in the first phase of projects like Civil's, creators are likely to experiment with different frameworks of functioning before finally adopting a mutated form of a former framework in order to design a more appropriate one (2003, p. 209). The finding that blockchain-based models are not yet ready for large-scale implementation is consistent with evidence from blockchain research (see for example Gartner's Hype Cycle) showing that the technologies and their promises might only take off within the next decades.

6.1.2   Media face an innovator's dilemma with regard to blockchain technologies

Our second finding that is consistent across the interviews with the Quebec experts is that journalism clearly faces an innovator's dilemma with regard to emerging technologies, one of the main characteristics of disruptive technologies: the strategic conflict between the seduction of the present success and the investment in supposedly promising technologies, to summarize the essence of Christensen's concept. More concretely, the innovator's dilemma in the journalism context involves social and technical elements alike, illustrating the complementarity of Flichy's and Christensen's theory. In addition to the finding that "the general trend has been to complicate, rather than simplify" (Mari, 2019, p. 3) the interplay between technology and journalism, news organizations are indeed likely to hesitate to invest in blockchain because it is unpredictable if the investment will pay off in terms of revenues and direct organizational benefits.

Especially for established media, the hurdle to invest in emerging technologies – i.e., the return in investment above which they are willing to invest – is higher than for newcomers (Vázquez Sampere et al., 2016, p. 30). What is more, the token buying process is still complex and time-consuming, and transaction costs for permanent archiving can quickly accumulate in a large news organization that is publishing numerous articles a day. In addition to the fact that the potential of permanent archiving might not yet be perceived by journalists (a vivid example of the discrepancy between the characteristics of the disruptive technology and the customer's needs as described by Christensen), the associated costs could partially explain why the Civil newsrooms do not use the Civil Publisher. In spite of our finding that blockchain technologies could reduce the cost of verification and the cost of networking of an organization, media companies may be blinded for those benefits since they are not tangible in the testing phase, but would only appear once the

platform is successfully implemented. To express it in the words of Flichy's theory, the framework of functioning currently appears opaque and risky to the social world of journalists, consequently hiding the potential promises of the framework of use and preventing its application. Instead, as interviewee F49 emphasized, the implied costs are likely to be more evident, as well as the fact that competitive platforms like social networks are less expensive. The high level of uncertainty with regard to the benefits and risks of blockchain – stemming from the fact that the technologies are still very young –, crypto regulation and the appropriation of the technology by journalists and audiences might set the hurdle to invest even higher. More importantly, the current crisis in the journalism industry and financial instability can reinforce the innovator's dilemma. On the one hand, academic literature and our interviews show that there is an increasing awareness for the necessity of concrete actions, especially in view of the competition from social media; on the other hand, financial difficulties do not allow for risky and heavy investments (implied in one expert's claim that investments are currently not welcome), and organizational structures hamper the implementation of technological tools (e.g. increasing time pressure, as highlighted by some interviewees). Reflecting Christensen's theory, these conflicts show that media companies are pursuing an upmarket strategy, focused on existing needs and oriented towards the traditional news industry, making them vulnerable to overlook entrants with innovations that arrive "from below".

In turn, the indecision with regard to the economic and technological investment in blockchain technologies can easily result in organizational inertia, a phenomenon that is widely discussed in academic literature (e.g. Christensen, 1999; Cozzolino et al., 2018; Orlikowski, 2000) and that can be related to the technologies' risk of social resistance. As outlined in section 2.2.1, technological advances have always affected the daily routine of journalism. Due to the finding that journalists today have to be more competent than ever (Wilke, 2014, p. 107) and blend journalistic and technical

tasks, one could expect that the framework of use and the framework of functioning – in line with the goal of the socio-technical reference framework – harmonically melt together in the formation of a polyvalent workforce; however, technological penetration in journalism has often been accompanied by a trend to resistance or "abrupt inactivity" (Vitali-Rosati, 2019), an indicator that the industry is familiar with the innovator's dilemma. The remark of an expert (F49) that journalists easily abandon new technologies if they do not immediately deliver the desired benefits reinforces this trend to resistance and abrupt inactivity. Zimmermann and Schreiber believe that "it was not the technologization as such that was scarcely criticized by journalists but rather the rationalization imperative that was behind its introduction" (Zimmermann & Schreiber, 2014, p. 13). This rationalization imperative comprises constraints like the acceleration of production and distribution processes (Wilke, 2014, p. 104), time pressure or the obligation to appropriate the new technology. Additionally, journalists tend to stick to existing needs, according to the theory of disruptive innovation a common attitude of incumbents: they focus on editorial independence rather than on economic issues like sales, strategy, marketing and revenues (Skok, 2012, p. 5), explaining why journalists consciously decide to miss out on the new technology, as feared by a Quebec expert (N63). Finally, the innovator's dilemma can be fueled by the technological immaturity of blockchain, a criterion that can usually be found in disruptive innovations in initial stages when they do not yet correspond to customer (i.e., journalists') demands.

Applied to our research, the finding that journalism is an industry that does not always welcome technological change implies that the adoption of blockchain technologies might be threatened by a general tendency among news organizations to resist new technologies. As Christensen argues, incumbents are likely to be left behind if they do not adopt the new technology. Resistance and inertia might be even more intensive as blockchain introduces new operating paradigms (self-governance)

and additional steps in the workflow (permanent archiving, smart contracts) which users are not used to.

6.1.3 Blockchain does not correspond to user habits and needs

Our interviewees agreed on the fact that users (both journalists and audiences) are currently still unfamiliar with technical characteristics like decentralization, greater user responsibility due to disintermediation, self-sovereign identity management, unautomated, multi-step processes (token sale, permanent archiving) or cryptocurrencies. Moreover, due to their technological immaturity, blockchain technologies do not fulfill Christensen's characteristic of disruptive innovations being simpler to use and more convenient than existing technologies in journalism. Hence, we can identify a mismatch between user habits, blockchain characteristics and technical understanding which could result in the behavior to miss out on blockchain technologies. In combination with social resistance both on the part of journalists and audiences, this mismatch might also be the reason why the Civil community, the percentage of newsrooms storing content on Ethereum and the number of people possessing cryptocurrency is at a marginal level. However, in view of the numerous challenges for the news industry, the finding that the features of blockchain technologies did not convince our Quebec experts of their potential is remarkable. As we have shown in the previous chapters, media scholars and professionals alike agree on the fact that journalism must undergo fundamental change. Nevertheless, our case study shows that the technological zugzwang might be overshadowed by organizational risk aversion. A stepwise consumer education as proposed by our interviewees could help to make the promises and challenges of blockchain technologies in journalism for both audiences and journalists more understandable and tangible, reducing fear and hesitations of adoption.

In line with our finding that media implement new technologies when they perceive competitive pressure or new trends in consumer behavior, news organizations might adopt blockchain technologies only when they feel "forced" to use them. Given that such pressure from competitors and audiences is inexistent at the moment, the adoption and hence the disruptive potential of blockchain in journalism are likely to depend on the pace with which blockchain features and user habits can be aligned.

6.1.4　Journalists and audiences do not feel the need to adopt blockchain

Since blockchain features do not correspond to current user habits and needs, journalists and audiences do not feel the need to adopt the technologies and the Civil model in particular. This behavior is consistent with our findings from blockchain literature showing that interest and success stories beyond the financial sector are scarce.

While journalists do not want to introduce complex and time-consuming operational steps in their daily work, an explanation for inertia and social resistance on the consumer side could be that people are not aware of the current crisis. According to the Reuters Digital News Report, 68% of respondents either do not know about the current problems of the journalism industry or think that media companies are making a profit from digital news (Newman et al., 2018, p. 25). Furthermore, as our interviews showed, ordinary news consumers or journalists are not yet aware of blockchain's potential for the industry, do not understand them in detail and react with reservations. It is especially difficult to promote the promises of blockchain technologies when the benefits of existing tools are more evident. For example, incentivizing people to acquire crypto is challenging since common payment methods like credit card, Apple Pay, Google Pay or PayPal fit customers' needs.

Such knowledge gaps may be reasons for the missing sense of urgency in adopting blockchain. A typical characteristic of disruptive technologies is that incumbents do not adopt the technologies because the market demand is not there yet; instead, we can observe a crucial gap between the expectations of consumers and the technical features of blockchain. This dynamism corresponds to Christensen's definition of a disruptive innovation: the improvements offered by blockchain technologies increase faster than the improvement rate that consumers are able to absorb. This is mirrored in the fact that although the understanding of and interest in blockchain-based news platforms by potential users does not visibly grow, the progress in blockchain research and the advances in the Civil project continues at a steady pace – and could rise exponentially in the future, if the appetite for blockchain in academia and specialist circles increases.

This said, it is possible that the technologies' performance might outperform the performance demanded by the market one day. In the case of the news industry, the principal performance demanded by journalists is the possibility to publish their work in a safe manner which protects their intellectual property while at the same time offering a sustainable funding model. On the consumer side, the performance demanded is the ability to access reliable and customized news in real time, with only a few clicks (maybe directly delivered in their inbox) and at a low price, as well as the protection of their personal data. Due to blockchain's potential with regard to permanent archiving, micropayments, decentralization, self-sovereign identity, self-governance mechanisms and smart contracts, the technologies could one day meet and even surpass the market's demand.

Closely linked to the divergence in market demands and current consumer expectations is the technological performance of blockchain technologies. As demonstrated throughout the previous chapters, Civil faces challenges regarding user

experience, product design and latency caused by the decentralized system. This finding corresponds to Christensen's finding that disruptive technologies often underperform in several categories that are especially important for users; in the case of the Civil project, these categories are user-friendliness and an unsophisticated product design. Instead of presenting an alternative, simpler model for journalism, the Civil platform requires personal engagement and investment that customers do not perceive as necessary.

6.2   Factors refuting the disruptive potential of blockchain in journalism

In contrast to those four factors that support the thesis that blockchain technologies have a disruptive potential for journalism, some observations of our case study and evidence in the literature refute these arguments.

6.2.1   Blockchain could face competition from other tools and technologies

Closely linked to the finding that users do not feel the need to adopt blockchain technologies and Civil, blockchain in general faces competition from other tools and technologies. Several examples for this competition can be found. For example, conventional payment methods for subscriptions, membership fees or donations like credit card, PayPal, Google Pay and Apple Pay are difficult to substitute with cryptocurrencies because they are deeply integrated in consumers' payment behavior. It is a striking finding that Civil Boosts struggle to attract donors although they accept all those payment methods. However, fundraising tools like Kickstarter might attract a larger donor base because they have a stronger brand and can prove success stories whereas Civil is known only to a small percentage of news consumers, hence offering

an unfavorable time-return ratio for journalists to set up a Boost. Moreover, token rewards could be replaced by more common incentives, for instance the direct emission of vouchers for traditional shops as a newsroom interviewee proposed (instead of the emission of tokens which then have to be converted). With regard to communities, the remark of our Quebec experts that communities already exist, for example in the form of Facebook groups, shows that the media tend to use the platforms with the highest audience density. However, it has to be kept in mind that large-scale platforms and big players in the blockchain field do not yet exist.

If large news organizations decide to make use of new technologies anyway, they prefer a strategy of resistance and first rely on more promising and safe alternatives which provide more practical evidence like artificial intelligence or machine learning (O'Dair, 2019, p. 65). Only one Quebec expert (F49) confirmed this preference, showing that this aspect requires further evidence from research and practice. It goes without saying that any technology faces competition from other technologies. Moreover, it has to be noted that technologies should not only be viewed separately from each other, but that they can be used in parallel or even be combined. Such combining approaches allow to benefit from technological synergies instead of applying different technologies in isolation.

However, the expert's remark could be an indicator that alternative emerging technologies might be perceived as more promising and less risky by journalists although they introduce a similar level of complexity and could be a starting point for future research. We argue that the competitive threat of alternative tools and technologies for blockchain in journalism is particular inasmuch as it results from the uncertainty about blockchain's final outcomes as well as the lack of the awareness about blockchain's novel promises over other technologies and first realizations by existing projects like Civil. Moreover, the current lack of regulation regarding

cryptocurrencies as well as the environmental concerns of the PoW mechanism make blockchain technologies particularly vulnerable to reservations and disapproval, hence overshadowing their promises and potential. Christensen points out that a disruptive technology will catch on if it is "better able to complete the job" (Christensen et al., 2012, p. 11). In terms of new operational and technological paradigms (decentralization, disintermediation, permanence, etc.), blockchain can certainly do so. However, the crisis currently forces news organizations to define the ability to better complete the job as the ability to quickly and easily access audiences, facilitate scoops and deploy affordable, low-risk tools. In this current situation, alternative emerging technologies can outperform blockchain technologies. In turn, however, this potential could be exploited by integrating technologies like AI or machine learning in blockchain-based news platforms like Civil's. Since our data did not provide enough material to examine possible combinations of blockchain and other emerging technologies, it might be worth exploring possible approaches for the coexistence of different technologies in journalism in future research.

6.2.2   Blockchain technologies cannot replace existing models in journalism

Unsurprisingly, another argument refuting the disruptive potential of blockchain technologies for journalism that was highlighted by the Quebec experts is that they cannot replace existing models, especially in the form of Civil's platform. This is consistent with the finding of American researchers who argued in the Harvard Business Review that blockchain is not disruptive because it cannot outperform conventional business models with lower-cost strategies and surpass incumbents quickly. Instead, blockchain can introduce "new foundations for our economic and social systems", suggesting that blockchain technologies represent foundational technologies (Iansiti & Lakhani, 2017, p. 4). In the case of journalism, this is

especially true for the funding model. As we have shown, the crypto model itself, including micropayments and tokenization, can be *disruptive*; however, it cannot *disrupt* existing funding models and sources at large. In line with studies suggesting that new funding models should be based on multiple revenue sources (see for example Pavlik in section 2.2.3), Civil currently combines the features of its platform with traditional approaches because a complete and radical replacement of existing infrastructures inside news organizations would neither be feasible from a structural and technological point of view (especially due to blockchain's immaturity) nor accepted by journalists (social resistance). The revenue models of the majority of Civil newsrooms consist of a combination of advertising, subscriptions, premium content, crowdfunding, membership fees, "fan shops", sponsorships and donations. Especially the inclusion of advertising suggests that blockchain cannot replace this traditional funding pillar of journalism. One way to renew this funding source would be to introduce "smart advertising" (comparable to the Brave Browser) where users have more control over their data, as Civil proposes.

In addition to the specific challenges for crypto tools (resistance, mistrust, lack of regulation, environmental issues, etc.), they are confronted with the same obstacle as common funding tools: the decreasing willingness to pay for news, especially in the form of donations. In Canada, for example, only 1% of respondents claim to have made a donation to a digital media (Brin et al., 2019, p. 13). The remark of an expert that the intersection between donors and token holders is probably very small makes it even more unlikely that funding models based on crypto can disrupt existing funding models.

To summarize, blockchain technologies are unlikely to replace existing models applied in journalism, but can only complete, improve, extend or adapt them. Taking this idea one step further, combining blockchain technologies with traditional

technologies, models and tools could threaten the implementation of a complete decentralized system without intermediaries.

6.2.3 Intermediaries and centralized control are not taken out of the equation

The continuation of the combination strategy regarding the news funding model clearly contradicts one of the core ideas of blockchain to boycott the dependence on centralized structures, thus also refuting the technologies' and more specifically Civil's disruptive potential. Although such multi-source models ensure sustainability, they can also "open the door to outside influence and lead to biased editorial decisions" (Al-Saqaf & Edwardsson, 2020, p. 109). More importantly, the fact that Civil accepts third party products and models means that the Civil community still depends on multinationals like Google, Apple, PayPal and other intermediaries like advertisers and providers of central servers – all targets to be eliminated by blockchain. This dependence does not only affect the intensity of the disruptive potential of blockchain, but furthermore creates the risk that Civil subjugates itself to the GAFAM.

Strictly speaking, the stake of ConsenSys in the Civil project is another element which could threaten Civil's level of decentralization and disintermediation – described as "non-zero risk" by one American journalist. Due to the financial support of ConsenSys, called the "first crypto conglomerate" by Forbes (Kauflin & Hansen, 2018), the success and stability of Civil is determined by the economic health of its parent company. In view of the insufficient profitability of the ConsenSys ecosystem that is mainly financed with the private property of ConsenSys founder Joseph Lubin, this dependence becomes even more threatening. Lubin himself admits that "most tech start-ups don't get funded the second time, it's not gonna be easy" (Zomorodi &

Poyant, 2018c, 18:50). If the financial source provided by ConsenSys or Lubin dries up, Civil either has to look for another investor, build a self-sustainable business model or consider the acquisition by an industry incumbent. This last option is according to Christensen's theory a typical risk for small pioneers (Christensen et al., 2015) and should be avoided if the mission to create a decentralized marketplace for journalism is to be taken seriously.

Al-Saqaf and Edwardsson identify another dependence (2020, p. 110). The Civil platform is built upon the Ethereum blockchain and its cryptocurrency ETH which exposes Civil to the risk of slow transaction speed in peak periods, cyber attacks or even a potential shutdown of the Ethereum network. This is not a risk that only concerns the Civil project; any news organization experimenting with blockchain will have to deal with the uncertainties that arise from the interaction with a blockchain network – we highlighted hidden centralization as a major risk of blockchain technologies in chapter 2. Already today, Ethereum is delegating the cryptocurrency market and has power over numerous start-ups using their blockchain network (O'Dair, 2019, p. 85), calling into question the decentralized character of the leading blockchains.

The revelation of these multi-dimensional dependences arising inside and around the Civil project is an unexpected key finding of our case study. Although we have shown that hidden centralization is discussed by research, we notice that *hidden intermediation* is a less explored phenomenon. On the one hand, this finding risks trivializing the interdependencies of parties involved in a blockchain project for journalism. On the other hand, it proves once again that blockchain technologies are simply too immature to completely impose "third-party less" structures.

In the next section, we discuss how the disruptive potential of blockchain technologies could concretely be realized in journalistic practice by presenting a possible, special form of disruption.

6.3   Disruption of the Stolen Model

Throughout the last sections, we have shown how technological progress has repeatedly disrupted the news industry. In this section, we explore which role blockchain technologies could play with regard to the last disruption: the advent of the Internet and social media. In order to answer or research question, we focus in the next paragraphs on the disruptive potential of blockchain technologies in general (i.e., regardless of the news organization's choice to implement the Civil model or to develop a new blockchain-based news platform) while illustrating our analysis with the concrete example of Civil. The link between blockchain and social media is a key part of our research since the tendency to associate blockchain and disruption with social media, especially Facebook, was a repetitive pattern across all our interviews. In order to understand this interplay, we briefly explain which dynamism the emergence of social media has caused in the news industry. This explanation is based on the findings we outlined in the literature review: by taking over and optimizing the ad model and attracting formerly loyal news consumers, tech companies and social media were able to absorb the majority of ad revenues which fueled the crisis of the journalism industry.

From a general point of view, technology in journalism serves both as a trigger of and a means to disruption, introducing a spiral chicken-or-egg problem: Emerging technologies have always had a disruptive impact on journalism which caused numerous challenges for the industry. As a consequence, other technologies were

deployed to mitigate those challenges, resulting in new disruptions. Particularly the advent of social media brought serious turmoil to the journalism industry. A Gallup/Knight Foundation study shows that Americans believe in the positive impact of technological development and its outcomes like cable news, the Internet or citizen videos on the media industry, but think that social media and how it is used is increasingly a problem (Gallup/Knight Foundation, 2018a, p. 3). An Austrian documentary emphasized that companies with disruptive innovations like Amazon, Uber and AirBnB drive traditional players out of the market (Scobel, 2019, 2:47), hence threatening market balances. In line with these findings, Christensen et al. find clear words how journalists should address the digital era: "[...] the question of how best to survive in the new world will not be answered by hoping for a return to the past" (2012, p. 15). Taking this maxim to heart, we argue that blockchain technologies could put an end to this spiral. Instead of merely addressing problems of the journalism industry, blockchain could be a means to attack the disruption that has been taking place over the last few years.

One expert emphasized that Facebook's adoption of the traditional news model proves that the model is still working in practice. However, it has been complemented by a more efficient customization of ads "orchestrating third-party knowledge" due to sophisticated algorithms and the collection of personal data. So far, media and journalists have responded to what we refer to as the *Stolen Model* with different strategies. Those strategies which are rather defensive or accommodating correspond to three out of five possible responses for incumbents towards the emergence of a disruptive innovation identified by Charitou and Markides (2003). Table 6.2 provides an overview of those different responses in business practice and how news organizations apply them in view of the threat by social media.

Table 6.2   Responses and strategies of news organizations with regard to the disruption by social media (own compilation)

Response	Strategy	Explanation
Focus on and invest in the traditional business	Compete	Media improve their business by exploiting alternative business models (paywalls, subscriptions, memberships, philanthropy, etc.)
Ignore the innovation	Circumvent	In line with James Curran's strategy *continuity* (section 1.1), media and journalists persist in their core activities by neglecting social media as separate platforms
Ignore the innovation	Coexist and co-evolve (Fidler, 1997, p. 17)	Media and journalists are aware of the threat and influence by social media, but they accept the new competitor as a matter of fact
Adopt the innovation by playing both games at once	Make use of	Journalists use social media in their daily work as additional platforms to expand their reach (e.g. sharing and posting of articles, participating in Facebook groups)
Adopt the innovation by playing both games at once	Collaborate	Publishers establish partnerships with social media and work together on journalism projects, for example in the form of the Facebook Journalism Project launched by Facebook in 2017
Adopt the innovation by playing both games at once	Integrate	Media adapt social media in their business model in order to benefit from complementary sources of value creation (Cozzolino et al., 2018, p. 1180)

The fourth response to "embrace the innovation completely and scale it up" cannot be applied to the news industry since media do not try to copy the Facebook model (i.e., the Stolen Model plus the sale of user data). However, based on our case study, we add to Table 6.2 another possible, more offensive approach which is called *disrupt the disruption* by Charitou and Markides; applied to our research context, we call it the *Disruption of the Stolen Model*. According to Charitou and Markides, incumbents can attack disruptors by introducing a "third game" (in addition to the conventional

business and the disruptive innovation) that focuses on "still different product attributes" (2003, p. 60). Examples from other industries are (2003, p. 60):

- the launch of the Swatch, a watch developed by incumbent Swiss watch manufacturers which focuses on style as response to watches of competitors that are characterized by price and functionality;
- the focus of British Airways on comfort and luxury as response to the entry of cheap airlines like easyJet and Ryanair.

With regard to our research, blockchain-based news models like Civil could help to attack the Stolen Model by coming out with new *business model elements* that complement the traditional model. Conventional structures and journalistic processes like collaborative content production, editing, archiving, licensing or audience support can be complemented or improved by paradigms like self-governance, permanent and decentralized archiving, self-sovereign data management and IP protection, as well as peer-to-peer payments, and an inverted engagement model.

However, recalling Christensen, Facebook offers at present the performance demanded by the market: regarding its functioning as a medium, it provides news consumers with easy-to-click technology, quick and free access to news as well as the possibility to diffuse comments or own stories on a global scale without rigid verification. However, the performance demanded by the market may change in the future, resulting in an increasing interest in self-sovereignty, data protection, copyright, quality journalism, the elimination of fake news and hate speech, or simply the detachment from multinationals. As we have shown in the literature review about blockchain, such a shift is already pursued by cypherpunks and other tech-savvy people. In this case, Facebook cannot longer provide those needs, allowing

blockchain technologies to surpass social media and disrupt the disruption. As a consequence, a metamorphosis of the blockchain socio-technical framework to a set of disruptive technologies will take place, thus helping to reallocate lost value from social media back to the news organizations (by means of self-governance and tokenomics) and rupturing the dependence of traditional media on Facebook and Co.

Right now, the socio-technical framework of Civil already includes crucial elements that can fuel this metamorphosis, becoming apparent in the comparison with Facebook's reference framework: in the world of social media, the socio-technical framework is built in a way that favors the consolidation of centralization, which already represents a challenge for the journalism industry, as we highlighted in section 2.2.3. The framework of functioning is isolated from users, and reserved only to the company who runs the platform. This contradicts Flichy's idea that the framework of functioning should be co-created by actors from different worlds. In turn, the framework of use is intentionally based on a framework of functioning that is characterized by easy-click design. By oversimplifying the use of the platform, the users' interest in the framework of functioning is kept low: from a user perspective, a seamless experience with the platform does not require a deeper understanding of its functioning. From a platform perspective, in turn, users should only operate inside the intended framework of use whose principles are determined in the framework of functioning, including the voluntary divulgence of personal data, preferences and network activity and the renunciation of having a stake in the monetization of this information. More radically, it could be claimed that the socio-technical framework of Facebook tolerates a framework of misuse, and even reinforces existing technological paradigms (centrally controlled platform) and social paradigms (easy-to-use platform).

In contrast, Civil's framework of functioning is supposed to be co-constructed by a developer community and members of the Civil community, and the framework of use offers self-sovereignty by demanding users to invest time, money and energy in the tools and processes of the platform. A growing preference for socio-technical reference frameworks like Civil's that focus more on the roles and responsibilities of users, journalists and community members will be required if the disruption of the disruption is to be realized.

In order to summarize the various dimensions of disruption, we developed a simplified illustration of the disruption process in the form of three scenarios (Figure 6.1). At this point, it is important to explain the differences between Christensen's original theory, and the case of Civil and blockchain technologies in journalism. While Christensen argues that entrants enter the market and disrupt incumbents by providing consumers with innovative technologies that outperform existing technologies in terms of market demand, Civil is not a pioneer that represents a competitive threat to incumbent news organizations, but one that supports traditional media and small media outlets to overcome the crisis. In this context, the notion of disruption arises in two different directions:

- Social media have disrupted the traditional media (entrant 1; threat);
- Civil can help traditional media to disrupt the disruption (entrant 2; opportunity).

The first scenario in Figure 6.1 shows the latest disruption by social media (entrant 1) that contributed to the current crisis in journalism, affecting both traditional media and small media outlets. The second illustrates Civil's (entrant 2) current attempt to disrupt small and medium-sized newsrooms by means of blockchain technologies in order to address the challenges that occurred as a result of the crisis. Since Civil

currently does not try to disrupt incumbents, there is no connection between them and Civil, and they are presented in pale. The third scenario, however, depicts the potential adoption of the Civil model or the in-house development of other blockchain-based news project by incumbents. At the same time, Civil continues to work with small and medium-sized newsrooms, but since this collaboration does not change, the corresponding box is pale in this scenario. The construct involving Civil, incumbents and small media outlets could subsequently trigger the disruption of the disruption.

Figure 6.1   Disruption of the Stolen Model

The disruption process and especially the *Disruption of the Stolen Model* could provide an inspiration for both researchers and business practitioners. It could serve scholars in the field of blockchain, media or disruption as a visualization of disruption trails and mechanisms, and managers of incumbents as well as leading teams of small media as a conceptualization of the interactions between their organizations and other actors in the blockchain pitch.

However, in order to enable disruption by blockchain technologies in journalism, news organizations would first have to successfully implement blockchain technologies in their business and adapt (parts of) their business model. This is especially true for incumbent news organizations that operate within complex business structures. In the next section, we introduce some new terms which are crucial to understand our ideas. First, we explain the difference between *disruptive technologies* and *disruptive business models* as well as the difference between *blockchain adoption* and *business model adaptation*. Thereafter, we explore ideas of how media companies could implement blockchain-based news platforms into their organization.

6.4 Suggestions for blockchain adoption and business model adaptation

We first want to emphasize the difference between disruptive technologies and disruptive business models. Research carried out after the development of the theory of disruptive innovation shows that businesses must differentiate three forms of innovation: product innovation (Markides, 2006), technological innovation and business-model innovation (Cozzolino et al., 2018; Habtay & Holmén, 2014). Christensen corrected his theory which was initially focusing on technological innovation by stating that "it is a business model problem, not a technology problem"

(2006, p. 48). In section 2.1.4 where we presented the technical details of blockchain networks, we mainly focused on blockchain as a technological innovation. However, the findings from our case study confirm that the implementation of blockchain technologies in the journalism industry comprises both a technological and a business-model innovation. Whereas blockchain technologies as such represent a technological innovation enabling the creation of novel tools (tools for fundraising, archiving, identity and IP management with innovative, blockchain-enhanced features), they also allow to develop new business model elements (self-governance and tokenomics as proposed by Civil) without completely abandoning the old news model. As we briefly outlined in the literature review about the current challenges of the journalism industry, business model innovation is necessary due to the current absence of a sustainable business model.

The distinction between technological and business-model innovation also explains the difference between the two terms blockchain adoption and business model adaptation. Blockchain adoption describes the initial implementation of blockchain technologies and tools inside a news organization (implementation of the technological innovation). This adoption was mainly discussed by our interviewees and presented in chapter 5. In turn, business model adaptation represents the subsequent reconfiguration of the news business model (implementation of the business-model innovation). Although the business model elements self-governance and tokenomics can be implemented without other blockchain-based features like fundraising tools based on micropayments, permanent archiving and DIDs, we argue that only the combination of the business-model innovation and the technological innovation might ultimately transform *blockchain as an idea* into a construct whose socio-technical reference framework is robust enough to entirely enforce the *Disruption of the Stolen Model* on an economic and strategic level.

This section summarizes some ideas of how news organizations could realize blockchain adoption and business model adaptation. Turning back to Flichy, news organizations are currently in the second phase with regard to the development of the socio-technical reference framework describing blockchain projects in journalism: a phase which is imaginary, sometimes even utopian, and marked by the consideration of multiple possible solution approaches. Hence, it has to be noted that these ideas do not represent static recommendations, but rather reflections on the organizational and strategic level that could inspire future projects. Since strategists are crucial players for the long-term conception of the socio-technical framework – as we explained in section 3.1 – our reflections can be valuable especially for the management of incumbents, for example CEOs, chief technologists (CTO), IT directors (CIO) and chief strategists (CSO).

The basis for the section are the six economic incentives for blockchain adoption identified by our interviewees. In order to highlight the effects of these six incentives, we group them into three categories. Those categories were presented by Ezra W. Zuckerman in the MIT Sloan Management Review as different methods to bridge niche markets with mass markets. These methods are: experience curves, network effects and demand discovery (Vázquez Sampere et al., 2016, p. 30). Experience curves describe the phenomenon that the more a company is dedicated to the production process, the more experience it acquires in doing it and the less production costs it has to invest. Network effects, as already mentioned in chapter 2, characterize the dynamism that the value of a product for a single user increases with the number of other users consuming it (Savelyev, 2018, p. 558). Demand discovery means that "people often do not know what they like until they see it" (2016, p. 30). Christensen et al. add to this that consumers cannot formulate their needs because their thinking is framed by existing solutions (2012, pp. 10-11). Table 6.3 illustrates which economic matches with which category/categories.

In this paragraph, we briefly summarize the ideas of our participants without neglecting that those are so far only scenarios. Media companies can acquire and increase their experience with blockchain technologies by experimenting in side projects run by experts from different departments. We have already explained in section 3.1 that experience curves can in turn also improve the socio-technical framework. Furthermore, such cross-functional collaborations correspond to Flichy's conception of a socio-technical framework which brings together people from different social worlds with heterogeneous value systems. They could help to transform blockchain technologies into a *frontier object* which is understood and accepted by all users and employees inside a news organization. If well-known companies and institutions adopt such side projects and demonstrate the utility of the technologies to other players and users, network effects would take over and help to spread the word. In turn, this can trigger the creation of a sense of urgency, making news organizations and the public aware of the promises of blockchain and hence driving demand discovery. All three effects can be reinforced by incentives for audience engagement because they motivate users to go up on their learning curves (experience curves), invite other newsrooms and readers to join (network effects), and show them how blockchain tools can be applied and which rewards they can earn (demand discovery). Last but not least, targeting the business model of Facebook can demonstrate news organizations and audiences which of their needs Facebook cannot fulfill (demand discovery), hence increasing the incentive for the *Disruption of the Stolen Model*.

Table 6.3   Economic incentives for blockchain adoption and their effects

Economic incentive	Effect
• Experimenting with blockchain in side projects • Pooling diverse skills in one project • Encouraging audience engagement through token rewards	Experience curves
• Promoting the project through diverse role models • Encouraging audience engagement through token rewards	Network effects
• Creating a sense of urgency • Encouraging audience engagement through token rewards • Targeting the business model of Facebook	Demand discovery

In the next paragraphs, we propose some approaches how the economic incentives and their effects can help to adopt blockchain technologies and adapt the news business model. We address four strategic reflections in particular:

- Separate vs. existing business unit;
- Stand-alone vs. collaborative experiments;
- Open vs. closed models;
- Early vs. late movers.

6.4.1   Separate vs. existing business unit

The claim of one Quebec expert to experiment with blockchain technologies in a side project that cannot threaten the core business is consistent with Christensen's initial proposition to set up a separate business unit for testing a disruptive technology. A lot of studies have ever since examined the benefits and shortcomings of spin-offs, which is well summarized by Danneels (2004). Danneels concludes that there is no

unambiguous answer to the question if separate business units are advantageous or not (2004, p. 256).

In the context of blockchain in journalism, the News Provenance Project is an example for a successful side project carried out as a separate business unit. The New York Times runs the project as a small experiment which is separated from its day-to-day activities, and with a team that is part of the research and development group of the company. Such a strategic decision can be explained by the fact that media incumbents traditionally encounter difficulties when adopting a new technology because they are working with old organizational structures that are not conceived for it (Christensen et al., 2012, p. 20). Our findings, however, suggest that blockchain offers new tools and disruptive business model *elements* which cannot replace, but only adapt and complement existing models. With regard to business model adaptation, research recommends to integrate the disruptive innovation within the existing organizational unit (Addo-Quaye & Fielt, 2019, p. 836; Habtay & Holmén, 2014, p. 301). The real potential or shortcomings of blockchain technologies and tools will only become apparent when observing its use and functioning in the day-to-day news business. A separate business unit risks not providing any incentive for journalists to integrate blockchain tools in their daily work; experience curves and demand discovery on the company side might be higher when experimenting with the blockchain project in the core business. Christensen et al. note that the New York Times, for example, has historically organized an important number of projects in "cross-discipline" teams whose members work in close collaboration with reporters and editors (2012, p. 18).

In line with the finding from our literature review that editorial and business operations increasingly merge (hence blurring the strict separation between business units) as well as Flichy's observation that different social worlds have to collaborate

closely in socio-technical frameworks, we present the idea to design a blockchain project as a research project that is not outsourced in a separate business unit, but closely tied to the news organization's core activities. In addition, the actors involved in the project could leverage both internal prior experiences and acquiring external competencies (Habtay & Holmén, 2014, p. 294). As noted by our Quebec experts, it may be advantageous to have specialists like developers, software engineers, data scientists and analysts already in-house because they have the ability to acquire blockchain skills without learning related technical concepts from scratch. Moreover, they already know the company's business model and processes, facilitating steep experience curves, and might enjoy a higher level of credibility and trust among newsroom workers than newly hired specialists. The Quebec experts suggest, however, to complement these internal capabilities with external resources like consultants and lawyers with more specialized knowledge about blockchain applications and cryptocurrencies. The integration of external knowledge can help incumbents to create new value at a lower cost (Cozzolino et al., 2018, p. 1194).

6.4.2 Stand-alone vs. collaborative experiments

As a next step, news organizations would have to decide whether they want to carry out a stand-alone experimentation or form alliances (i.e., partnerships providing mutual synergies) and acquisitions with disruptors or other incumbents (Cozzolino et al., 2018). Both stand-alone experimentation and alliances can favor experience curves and demand discovery; in addition, alliances can result in positive network effects.

While stand-alone experiments might be appropriate in the first phase of business model adaptation when disruptive technologies provide opportunities to seize

external economies, alliances and acquisitions can be valuable in the second phase when entrants pose an increasing threat to incumbents (Cozzolino et al., 2018, pp. 1180-1181). On the one hand, stand-alone experimentation is more likely in the highly competitive media environment. Media incumbents might be susceptible to carry out experiments in isolation because external economies benefit all incumbents (i.e., blockchain is available to anyone) and the technologies are not yet stable (2018, p. 1181).

On the other hand, stand-alone experimentation might be economically inefficient in view of the fact that news organizations can easily join the Civil platform and collaborate with Civil in that way. More formal alliances between incumbents and disruptors are also imaginable, as the partnership between Civil and the AP shows. Collaborations with Civil are especially beneficial in view of the difficulty for incumbents to replicate the model of a disruptor (2018, p. 1188). Moreover, since one "adage" of journalism is to abandon unsuccessful experiments very quickly, establishing alliances represent a less riskier and faster strategy for risk-averse media incumbents than stand-alone experimentation (2018, p. 1181). Given the "everyone for himself" mentality in journalism mentioned by an expert, it is unlikely that media organizations will cooperate among themselves. Furthermore, we explained in our literature review that mergers and acquisitions drive forward developments like concentration in media ownership and convergence and pointed out the phenomena hidden centralization and hidden intermediation. Based on these findings, it is neither a viable option for media incumbents to acquire Civil or other news organizations or being acquired by them. Hence, our proposition is to consider a mere collaboration with Civil, either as a Civil newsroom or a partner willing to test new Civil tools and models.

6.4.3   Open vs. closed models

The third strategic decision of news organizations would be the adaptation of the business model. Cozzolino et al. explain that only the inability to adapt the business model to the disruptive technologies will lead to organizational failure (2018, p. 1197). The business model can either be closed or open (2018, p. 1180). We have mentioned in section 2.2.1 that in journalism, the traditional – and stolen – model was a closed one where value was created and captured merely through internal knowledge and advertising revenues. In comparison, an open model creates value from internal and external knowledge and captures additional value from the interconnection of multiple platforms and users. Christensen et al. emphasize the need to embrace disintegrated, open systems in order to realize disruptions (2012, p. 12). In addition, an open system can contribute to the stability of the socio-technical framework: as we pointed out in our conceptual framework, viable frameworks of functioning and use require the negotiation with both internal and external actors. The ecosystem of blockchain start-ups is already characterized by a trend to open models, as noted in section 2.1.3. This can help incumbents in the news industry to increase their demand discovery with regard to blockchain technologies. Especially the proposition of our interviewees to establish external partnerships for the conversion of token rewards can be embedded into the open model.

However, a study from Cozzolino et al. shows that media incumbents often did not completely abandon the old, closed model (Cozzolino et al., 2018, p. 1195). The simultaneity of the old and the new model is even recommended in stages where the threat by disruptors (in our case, social media) increases (2018, p. 1195). In order to realize the disruption of the Stolen Model, media only have to "adapt the business model rather than to invent it from scratch" (2018, p. 1171). This adaptation particularly comprises the integration of blockchain-based business model elements

(self-governance and tokenomics as proposed by Civil) while pursuing the existing, closed business model (for example the continuation of paywalls). This is also the approach of Civil's newsrooms, as shown in the previous chapters: they maintain their business model and complement it with the participation in the Civil platform. Moreover, the brand of a news organization increases the preference of a mixed model (2018, p. 1198). The brand of media incumbents plays a crucial role for the creation of trust towards audiences, a finding that is supported by the Quebec experts. A US study about trust levels in journalism found that for 37% and 47% of Americans, the brand is very important and important, respectively, in contrast to only 14% who find it unimportant (Gallup/Knight Foundation, 2018b, p. 14). Accordingly, we want to highlight the strategic reflection to apply a combination of old (closed) and new (open) model.

6.4.4   Early vs. late movers

Last but not least, news organizations can adopt blockchain technologies by being an early or a late adopter. With regard to the journalism industry, we demonstrated in the literature review that media have always tended to be late adopters. In the blockchain industry, both early and late mover advantages exist (Park et al., 2020, p. 73). Park et al. summarize some key characteristics of early and late adopters (2020, p. 66). Early movers are often small and mid-sized companies, as for example the Civil newsrooms and Civil itself. Since they have the ability to lock in technological opportunities, they can more easily benefit from a steep learning curve. In contrast, large companies and low-tech industries (i.e., incumbents in the news industry) are susceptible to pursue a late mover strategy. Late adoption makes market entry less costly and R&D investments more attractive due to imitation.

Becoming an early adopter of blockchain technologies in journalism may entail some risks. Christensen notes that incumbents have to decide more carefully about initial investments in disruptive innovations since they can be higher than for pioneers (Christensen, 1997, as cited in Pavlik, 2013, p. 184). Moreover, since early adopters may have less benefit from the investment than late adopters (Pavlik, 2013, p. 184), news organizations often "let others be the first to test the digital waters". Institutional pride among media organizations (as highlighted by interviewee V14) could reinforce this preference for moving in late.

However, Charitou points out that a key success factor for the disruption of the disruption is the incumbent's level of motivation to respond to the disruptor (Charitou & Markides, 2003, p. 62). Especially in view of the risk that the targeted disruptor Facebook will entry the blockchain terrain, it is imperative for news organizations to overcome the innovator's dilemma and possible to consider becoming an early mover. Particularly early adoption by high-profile organizations as proposed by the Quebec experts could favor network effects in the news industry and create a sense of urgency. If well-known industry players with a strong brand assume a leading role in the adoption of blockchain technologies, other media are more likely to follow suit. Early movers can demonstrate which role blockchain technologies could assume in the journalism industry, and create a consciousness for the technologies' utility. By raising the awareness of blockchain applications in journalism, these network effects might also spread over to news consumers.

In conclusion, we summarize our strategic reflections with regard to blockchain adoption and business model adaptation as follows:

- News organizations could adopt blockchain technologies as a research project in their existing business;
- Joining the Civil platform might be an efficient way to experiment with blockchain whereas closer collaboration with Civil is conceivable in later stages;
- Developing a mixed model might be an appropriate way to adopt blockchain technologies, avoiding a completely new and exclusively open business model;
- The decision of being an early or a late adopter depends on the profile and industry position of the incumbent: early adoption by high-profile incumbents can incentivize late adoption by other news organizations.

All these suggestions have yet to be tested and evaluated by research and practice before being considered as viable recommendations; at the current development stage, it is more likely that news organizations encounter different challenges with regard to blockchain adoption and business model adaptation. In the next sections, we explain a phenomenon called the user socio-technical dilemma which could hamper the realization of blockchain adoption and business model adaptation, and outline how a paradigm shift on the social and technical side could mitigate it.

6.5   The user socio-technical dilemma

A factor that is likely to play a crucial role in the realization of the disruptive potential of blockchain technologies – as disruption of the disruption or in any other form – is a phenomenon that we call the *user socio-technical dilemma*.

Recalling Flichy, a frontier framework is always a combination of social and technical use. Our case study demonstrates that with regard to blockchain in journalism, those two forms of use easily become two opposite poles. In other words, as highlighted throughout the last sections, a crucial mismatch between social habits and expectations, and technological reality exists. In conceptual terms, there is currently a tremendous friction between the framework of use (limited use or even inertia) and the framework of functioning (the introduction of numerous novel technological paradigms). By simplifying the token sale and improving the user experience on the Civil platform (e.g. through the Kirby package), Civil wants to dissociate the framework of functioning from the framework of use: as interviewee S51 stated, users should not need to know the details of product design (see chapter 5). The process of detaching functioning from use already began with the introduction of wireless technology which allowed people to apply technology without comprehending the physical basics of its functioning (Fickers, 2014, p. 33). In the initial stage of the Civil project and the embryonic phase of blockchain technologies, the detaching approach can be valuable. Barriers which prevent "ordinary" people from participating should be torn down, and instead ways to encourage them to join should be explored. However, the continuous detachment of the framework of use and the framework of functioning in journalism could have favored the emergence of the user socio-technical dilemma. Moreover, we have seen in section 3.1 that the frontiers of the two frameworks should not be static in the beginning in order to allow

all actors to pass from one framework to the other in order to drive forward their evolution.

Flichy also reminds us that only a successful alliance between framework of functioning and framework of use can eventually result in a stable socio-technical framework. In the case of Civil, this alliance is not yet existent. This finding has two important consequences. First, the dilemma could accelerate the social polarization described in section 2.2.3, instead of slowing it down. At the moment, polarization in journalism is caused by information asymmetries and unequal access to news among audiences, as we already outlined. Discrepancies in technological skills, knowledge and interest could add a new dimension to this gap. While technology experts, laymen that we call the "converted" or readers who want to support alternative models for journalism might appropriate blockchain technologies or the Civil model, skeptics and those who are less familiar with blockchain are unconsciously excluded. The risk is that in the end, blockchain becomes an isolated, "geek only" phenomenon. First indicators for a growing gap between "blockchain-savvy" and "non-blockchain-savvy" people already appear: according to Matt DeRienzo, executive director of Local Independent Online News Publishers, blockchain technologies are a "heavily young, white male thing", leaving "many people out, especially those most in need of a voice" (Philp, 2018), implying that this socio-demographic group is likely to be privileged with access to technology and related skills. As we have already highlighted, this could restrict the community around the self-governance system.

The second consequence of the user socio-technical dilemma is related to the first one: the rejection of the Civil project by skeptics on the one hand and the unawareness about the project on the part of "non-blockchain-savvy" people on the other hand could result in a situation where "on-chain" operations are the exception, and "off-chain" transactions remain the norm. In other words, everything that happens

outside the blockchain news-platform is not subject to its rules, and can hence not be controlled. One example is permanent archiving. As we have shown, only few newsrooms decide to store their stories on Ethereum. We dare to claim that only newsrooms that are already producing quality journalism use the function; Techdirt founder Mike Masnick believes that those whose content is to be wiped out are most unlikely to participate in the Civil project (Ingram, 2018). Moreover, journalists might be deterred by the new paradigm of permanence on blockchain networks. As briefly explained in section 2.1.6, permanent archiving collides with the right to be forgotten, a principle introduced by the European Union, providing citizens with the right to have delicate personal information on the Web deleted. This contradiction does not only involve legal issues, but might also decrease the willingness of journalists to make use of the archiving functionality. As the Quebec expert remarked, keeping a permanent record of all published stories on a blockchain network could result in reputational discord or even the blockade of future career opportunities. Consequently, blockchain-based news platforms like Civil's could represent merely parallel worlds, allowing off-chain journalism to prevail and offering "bad behavior" journalism a fertile ground to exist. However, the on-chain/off-chain issue is not limited to the permanent archiving tool. For the self-governance system, it means that if the Civil community does not reach a critical size, the stamp of trust is susceptible to be of limited value. Although the "on-chain/off-chain" discrepancy is likely to become a challenge in more advanced stages of a blockchain project (i.e., when internal operations are supposed to run predominantly "on-chain"), the "off-chain" option can be an alternative strategy for news organizations in the testing phase when merely sporadic blockchain interactions prevail. The user socio-technical dilemma and its consequences may be especially evident at this early stage of the project. Once the socio-technical framework around the project becomes stable, the interaction between the two sub-frameworks will get weaker (Flichy, 2003, p. 223), and hence also their friction. However, the adoption of

blockchain technologies by news organizations will depend on the stabilization process of the framework.

We present the user socio-technical dilemma because it appeals to the responsibility of *users* – both audiences and journalists – to adapt their individual habits inside the framework of use according to the characteristics of blockchain technologies (see section 6.6.2). Even if Flichy's model is sociological in nature and the socio-technical dilemma also comprises a social dimension, the framework of use is conceived by individual users and hence on an individual, not on a social level. For blockchain-based news platforms to be viable options for news organizations and accepted by society, it is first necessary that individual users are aware of the gap between social habits and the technological reality of blockchain as well as its consequences (see above).

A combination of different factors can help to shape both a technical as well as social paradigm shift which, adopted by users, can mitigate the user socio-technical dilemma. In the next section, we analyze how technological infrastructures (technological paradigm shift) as well as social norms (social paradigm shift) determining the appropriation and use of technology will have to change in this context.

6.6   Paradigm shift

In line with the finding that the disruptive potential of blockchain in journalism cannot yet be unambiguously predicted, blockchain is not yet a social norm, as Flichy proposes for an ideal setting. As James Curran suggests for the thinking pattern *renaissance* (section 1.1) and Macnamara for journalistic practices and culture

(section 2.2.1), a paradigm shift will accompany the transformation of the journalism industry. This shift is likely to be bidirectional: a major finding of our case study is that the adoption of blockchain technologies in journalism is an interplay of social and technical factors. As we demonstrated in the previous sections, Civil has to stick with traditional paradigms in many regards because both the technological landscape and the mindset of potential users (journalists and readers) are not yet ready for the adoption of blockchain. In order to harmonize technology and use (framework of functioning and framework of use) and hence to facilitate the implementation and acceptance of blockchain-based models inside news organizations, the introduction of a technological as well as social paradigm shift will be necessary in the long term. The two-sided paradigm shift might already be the first step towards disruption since it shows that blockchain requires fundamental changes of how the functioning and use of technology is implemented. In this section, we explain how the paradigm shift could be realized both on the technical and the social side. Given the early stage of the Civil project, the paradigm shift has first to take place on an individual level before being transferred to an organizational or industry level. Therefore, the next two sections address notably individual users and developers: whereas the technological paradigm shift can be realized by the developer community and even Civil (which is already working on relevant initiatives), the social paradigm shift concerns both journalists and audiences.

6.6.1   Technological paradigm shift

The most essential transformation that has to be realized in order for blockchain technologies to catch on is the shift from Web 2.0 to Web 3.0, as discussed in section 2.2.1: a more "intelligent" Web giving rise to emerging technologies like machine learning, AI or data mining. In non-technical terms and for the context of journalism,

this means particularly a greater focus on decentralized systems, disintermediation, horizontal communication and participation of peers, as well as the introduction of self-sovereign identity management. Eventually, when this paradigm shift will penetrate existing technological infrastructures in newsrooms, a more important part of transactions and processes could be transferred to the blockchain-based platform. This could resolve the current off-chain/on-chain problem. To democratize the paradigm shift, compatibility between blockchain and other deployed technologies like CMS, publishing tools, databases or archives might be necessary in the beginning, after the platform has been tested in a side project.

Accordingly, the technological paradigm shift notably focuses on the framework of functioning. As we have explained, the framework of functioning is the sum of all technical knowledge and know-how. The remark of the Civil team member that the start-up is currently operating in the Web 2.5 is an indicator that this expertise is already being mobilized and that the paradigm shift slowly becomes apparent. Also the fact that Civil is working with a central server that stores states of the activities happening on the decentralized platform is an example for this intermediate status quo. Temporary solutions like the central server or the parallel use of blockchain and other technologies stem from the fact that blockchain is not yet mature enough to be deployed as a stand-alone technology. Moreover, such solutions try to accommodate the expectations of users who currently still stick with easy-to-use technology and are therefore not willing to accept additional steps (see token sale) or increased levels of latency. Accordingly, the realization of the technological paradigm shift is partially blocked by those expectations. However, since the theory of disruptive innovation suggests that disruptive technologies are unlikely to outperform the technological performance of existing technologies in terms of product quality, the technological paradigm shift has to be accompanied by another paradigm shift focusing on the

social challenges that currently risk hampering the adoption of blockchain in journalism.

6.6.2   Social paradigm shift

The social paradigm shift concerns the framework of use: as presented in section 3.1, this framework comprises all possibilities how the *frontier object* can be used and appropriated. The social paradigm shift consists of users accepting the technical paradigm shift and integrating it in their interaction with technology. As highlighted several times throughout this research, a big barrier to adoption of blockchain technologies in journalism are the habits of consumers who are "pampered" with a convenient use of technology. Those habits have led to a preference for "lowest friction ways" (interview L68) like the use of PayPal or Patreon to donate money to news organizations, and hence also for a preference for simplicity over self-sovereignty, including a growing dependence on intermediaries (Howle, 2018). To put it in blunt words, "we have all collectively traded away our power on the internet for convenience" (Howle, 2018).

If blockchain is to introduce an important change in journalism and unfold its potential, a social paradigm shift will be inevitable. If users accept the paradigm shift, the social and technical self-governance mechanisms might attract a more significant number of people, delegating the creation of the framework of use and framework of functioning to the community. Civil' current dissociation of the two frameworks can hence only be an ephemeral solution because if consumers get used to this separation, the gap between the two might continuously diverge, splitting the socio-technical framework in two distinct constructs that evolve in isolation from each other. The

more blockchain technologies would improve, the more users would resist to its adoption, or "poach" (see chapter 3) the framework of functioning.

Accordingly, the social paradigm shift does not only concern the leveling of beliefs in easy-to-use technology, but furthermore the propagation of social acceptance of greater consumer engagement. The technical paradigm shift manifesting in the penetration of decentralized systems where the user (i.e., journalist and reader) has more control over his actions comes along with a greater responsibility and the need to be less passive. This does not only affect blockchain-based news platforms like Civil's, but also the level of engagement and support of news consumers towards journalism in a more general sense. New York Times journalist Bromwich warns that readers are not even willing "to pay *normal* money for journalism" (Bromwich, 2018). Moving them to a platform which demands autonomous interaction with a complex technology as well as the investment of time and money could decrease their willingness to contribute to the creation of quality journalism. In order to come up with a significant number of community members, blockchain technologies have to be pushed beyond the boundaries of people's mindsets. First and foremost, consumer education will play a key role in fueling the social paradigm shift, promoting a new consumer behavior which contrasts the conventional way users interact with technology and journalism. Learning about the risks of easy-click technology deployed by powerful corporations can fuel the generational shift predicted by a Quebec expert. A solid consumer education can help users (audiences and journalists) to understand the purpose, promises and risks of blockchain-based tools, increasing the probability that they appropriate them well. As we have outlined in our conceptual framework, they can even become tacticians of the socio-technical framework if they comprehend its design and hence "extend the act of the designer".

Thereafter, if the paradigm shift will occur in both directions (technical and social), it may be possible to lift the current separation of framework of use and framework of functioning. This is crucial for the development of a balanced socio-technical framework, especially in the case of Civil whose framework of functioning and framework of use are inherently intertwined due to Civil's core vision to merge blockchain technologies (technical use) and journalism (social use).

Introducing a two-fold paradigm shift will take some time, making it even more difficult to determine if blockchain can be disruptive from the outset. This applies to many disruptive innovations; minicomputers, for example, "were disruptive by virtue of the path they followed from the fringe to the mainstream" and not because of their later reputation (Christensen et al., 2015). Christensen himself and his colleagues warn:

> A [...] common mistake is to focus on the results achieved – to claim that a company is disruptive by virtue of its success. But success is not built into the definition of disruption: Not every disruptive path leads to a triumph, and not every triumphant newcomer follows a disruptive path. (Christensen et al., 2015)

Hence, it is important to note that even if the Civil project will fail, blockchain models and tools can still be disruptive for journalism; vice versa, blockchain technologies will not automatically be disruptive if news organizations "are dethroned or missed the technology" (Christensen, 2006, p. 41).

Recalling one of the Quebec experts, it is indispensable to point out that – regardless the eventual intensity of the disruptive potential of blockchain technologies in journalism – disruption is always a two-sided, Janus-faced phenomenon that can have both positive and negative impacts. The ambiguity of disruption manifests in the

controversial opinions of our interviewees; while the Civil team and the Civil newsrooms did not see many risks of using blockchain, the experts in Quebec were more doubtful than their American counterparts. Even among the Quebec experts, we observed an indecision with regard to the question if blockchain is rather a curse or a blessing for journalism, and at which moment a potential disruption might occur. Matthew Iles claimed in a podcast that Civil "is a ten year, twenty year vision" (Zomorodi & Poyant, 2018d, 27:36). Taking into consideration the remark of an expert that the media landscape is likely to become seriously eroded within the next decade, clashes between resisting and proponent forces regarding blockchain can be expected in the years to come.

Before reflecting in the next sections the major findings of our research and discussing their contribution to theory and practice, we illustrate in Figure 6.2 the key elements of our case study on a theoretical and practical, as well as on the individual, organizational and industry level, and recapitulate which actors each of them addresses.

LEVEL		Individual	Organizational	Industry
Theoretical		User socio-technical dilemma = Gap between social habits and technological reality; friction between framework of use and framework of functioning Consequences: • On-chain vs. off-chain activities • Blockchain-savvy vs. non-blockchain-savvy people	Blockchain-based business model Permanent archiving / Smart contracts / DIDs / ... Blockchain: self-governance & tokenomics Traditional news business model	Disruption of the Stolen Model
	Actors	Users: journalists and audiences	Management of incumbents (CEO, CTO, CIO, CSO, etc.) and leading team of small media	Media, blockchain and disruption scholars; Management of incumbents and leading team of small media
Practical		Two-fold paradigm shift Social: Acceptance of blockchain & greater user engagement; consumer education Technical: Improvement of user experience, shift from Web 2.0 to 3.0	Suggestions for blockchain adoption & business model adaptation 6 economic incentives and their 3 effects; 4 possible organizational strategies	Blockchain – potential for disruption? Blockchain both as... Technological innovation (blockchain technologies and tools) Business-model innovation (self-governance and tokenomics) => Existence of both factors favoring & refuting the disruptive potential of blockchain
	Actors	Developer community; Civil	Management of incumbents (CEO, CTO, CIO, CSO, etc.)	Journalists, editors and management of incumbents and small media; blockchain practitioners

Figure 6.2   Key elements and addressed actors of the case study

6.7 Contribution

The contribution of our research is based on two important knowledge gaps. First, there exist only some business examples developing prototypes that test blockchain networks for the use in news organizations. Second, as we outlined in the first chapter, few scientific papers address the potential of blockchain technologies in the field of journalism.

6.7.1 Contribution to academia

Our findings offer new insights for both blockchain researchers and media scholars. For scholars in the field of blockchain, our case study provides new findings about the third generation of blockchain, in the field of journalism where literature is even more scarce than in other sectors. We tried to enrich blockchain research by exploring the phenomenon at hand as a unique case in the sense of Yin. The analysis of Civil allowed us to link theoretical knowledge about blockchain 3.0 with a practical business example, providing novel insights about blockchain projects in the journalism industry. Our findings aim to start filling the gap in blockchain research in journalism, and to come out with some first propositions that could even be used in other blockchain 3.0 research projects.

Media scholars, in turn, can use and further develop our findings by analyzing blockchain technologies as a possible way to address challenges of the current crisis. Since modern research in media and journalism particularly focuses on the current transformations of the industry, our case study could be valuable for the scientific community which could add blockchain-based news platforms to their portfolio of possible solution approaches. Moreover, in view of the reproach that research is

"dominated by a far-reaching blindness regarding technology" (Zimmermann & Schreiber, 2014, p. 12), our contribution to media studies is to present blockchain as a set of technologies that can support journalists in their daily work by providing them with new tools, adding disruptive business model elements to their existing business model and potentially disrupting social media – without neglecting the immaturity of the technologies and the shortcomings of the Civil project.

For both media studies and blockchain research, we added a new academic perspective on the topic (which currently includes for example the study by Al-Saqaf and Edwardsson who examined blockchain based on the diffusion theory of Rogers) by analyzing the results of the case study through the lens of Christensen and his theory of disruptive innovation as well as Flichy's socio-technical reference framework. This two-dimensional conceptual design prevented us from being to biased with regard to one theory, and allowed us to explore the phenomenon from a broader viewpoint. With Flichy's theory, we revealed that blockchain in journalism is indeed a technical as well as social phenomenon whose viability will depend on the ability to harmonize the framework of use and the framework of functioning. Moreover, we found that it might be too early to determine the disruptive potential of blockchain for the journalism industry. However, we discovered that blockchain technologies have some characteristics of disruptive technologies (presence of an innovator's dilemma, lack of a sense of urgency, underperformance with regard to market demand). Accordingly, our study provides a starting point for similar studies, either with a comparable research design in order to reinforce or refute findings of this study, or with an opposing research method that adds complementary results.

With regard to Christensen's theory, our study makes several theoretical contributions. First, we extend the idea of the disruption of the disruption to the journalism industry by presenting a construct we call the *Disruption of the Stolen*

Model. To our knowledge, no approach exists so far that presents blockchain technologies as a way to disrupt the disruption by social media. We show that traditional media could disrupt the Stolen Model of Facebook by complementing the traditional news model with disruptive business model elements like self-governance and tokenomics as already proposed by Civil as well as other blockchain tools like permanent archiving, smart contracts or decentralized IDs. Hence, our study suggests a form of business model adaptation that is in between the mere reconfiguration of the old model and the radical creation of a completely new model.

Second, our research applies the theory of disruptive innovation to a specific industry constellation where traditional companies are confronted with two different entrants (disruptors) which do not correspond to the classical entrant described by Christensen. Entrant 1 (Facebook) did not disrupt the media landscape by introducing a disruptive business model, but by adopting ("stealing") and adjusting (with sophisticated algorithms and collection of user data) the traditional news business model. In comparison, entrant 2 (Civil) aims to provide news organizations with a blockchain-based approach to overcome the crisis which could potentially disrupt entrant 1. In other words, our research adds a new perspective on Christensen's theory by suggesting that the adoption of blockchain technologies is not a measure to compete with a new entrant (Civil), but a means to disrupt an old entrant (Facebook). This double-entrant construct offers a new perspective on the theory of disruptive innovation by suggesting that not every entrant comes up with a completely new business model and represents a threat to incumbents.

Third, based on the idea of the *Disruption of the Stolen Model*, we provide media companies with first reflections and scenarios from an organizational point of view of how they could integrate blockchain technologies into their business. Our case study allowed us to identify six possible economic incentives illustrating how experience

curves, network effects and demand discovery can be realized. Based on these six incentives and their effects, we were able to suggest four possible ideas described by literature for blockchain adoption and business model adaptation in journalism.

6.7.2   Contribution to business practice

Given that blockchain-based applications for journalism have a close link to practice, the research can also be relevant for different business actors. Analogous to our scientific contribution, our case study addresses both practitioners interested in blockchain as well as journalists, editors, managers and other employees inside news organizations. Actors in the media industry can use our findings – especially the six economic incentives and the four strategic ideas for adoption – to elaborate more sophisticated business plans for companies in order to assist them with the implementation of blockchain. Inside media organizations, journalists could explore by means of our findings how blockchain might impact their daily work; editors and managers can discover more precisely how a blockchain project could be integrated and aligned with their business model; and employees in other departments (graphic designers, computer scientists, data analysts, etc.) may learn about specific blockchain tools they can use in their professional field (e.g. smart contracts).

By illustrating the case of Civil, we aimed to provide all media stakeholders with an overview about related opportunities, challenges and risks, as well as with first suggestions of how blockchain could be implemented inside their newsroom and benefit their business. Although we tried to consider news media in general, the interest of the study for small media outlets might be different than for established news organizations. The presentation of the Civil platform and its tools could be valuable for small and medium-sized newsrooms that correspond to the profiles of the

Civil community. The analysis of the Civil ecosystem including both promises and challenges could invite them to join the project, and guide them throughout their participation. In contrast, bigger news organizations may view the Civil platform as a prototype which they can experiment with. Section 6.4 which describes possible incentives and ideas for blockchain adoption and business model adaptation might be particularly valuable for those incumbents. The synthesis about the factors that favor and refute the disruptive potential of blockchain can serve journalists, editors and managers in small and large media companies as well as blockchain practitioners as a first attempt to explore the opportunities and barriers to adoption of blockchain technologies in the journalism industry.

For both academics and business experts, we tried to present blockchain as an *idea*, instead of a mere set of immature technologies with technical shortcomings and negative ecological implications (although the resolution of these problems has to be a crucial element of future research). However, as we have shown in the previous sections, the viability of the *Disruption of the Stolen Model* will depend on the media's capability to transfigure this idea into a stable socio-technical reference framework. Regarding blockchain technologies in journalism in their current form (e.g. as they are implemented and used on the Civil platform), the findings of our analysis suggest that it is rather unlikely that blockchain will be able to have a direct impact on large-scale phenomena like the concentration of media ownership, convergence, disaggregation, or audience fragmentation. Nevertheless, the positive evolution of Civil and the potential disruption of the Facebook model are first steps towards the creation of a journalism business model based on trust, community governance, self-sovereignty, disintermediation and decentralization. With this harbinger in mind, the last group whom we address with this research are audiences whose support will impact the feasibility of a new operating model in journalism. For them, this study summarizes ideas of how they can make use of blockchain-based

news platforms as news consumers, and how a change in behavior could drive forward the creation of decentralized quality journalism.

In the last chapter, we summarize the major findings and contributions of our research, explain its limitations and present some ideas for future research.

CONCLUSION

7.1 Summary of major findings and contributions

In this case study, we analyzed through the lenses of Flichy and Christensen how blockchain technologies could help news organizations to address the challenges of the current crisis, and how they could even have a disruptive effect on the current media landscape. In order to link the promises of blockchain to a practical example, we based our case study on the New-York-based start-up Civil who developed a platform for journalists backed by the Ethereum network, supported by interviews with the Civil team, newsrooms participating in the Civil project and journalism experts in Quebec.

We identified factors that favor and refute the disruptive potential of blockchain in journalism, suggesting that it cannot be clearly determined if the technologies have a disruptive potential for the journalism industry. Factors that favor the thesis that blockchain technologies are disruptive are the creation of new business model elements like self-governance and tokenomics as currently implemented by Civil, the innovator's dilemma of media organizations with regard to the investment in blockchain, the mismatch between blockchain features and user habits as well as the missing sense of urgency to adopt blockchain. In comparison, three factors refute blockchain's disruptive potential: the competition from other tools and technologies, the inability of blockchain to replace existing models in journalism and the persistence of intermediaries and centralized control.

Furthermore, our findings revealed that the Civil ecosystem provides newsrooms with innovative tools and models whose use and functioning still deserve further refinement in order for blockchain technologies to have an impact on the industry level. The reason for the current mismatch between theoretical promises and practical evidence is that both technological infrastructures and social mindsets do not yet align with the paradigms of blockchain technologies – a phenomenon that we call the user socio-technical dilemma. In order for blockchain technologies to become successfully integrated in a news organization and its business model, it will be necessary to provide different technological, social and economic incentives. Our interviews revealed the special importance of consumer education, an improvement of the user experience and the development of incentives for blockchain adoption and business model adaptation. However, the evolution of blockchain technologies will also depend on future developments that cannot be influenced directly, for example on how fast a technological and social paradigm shift will take place. If the mindset of journalists and news consumers evolves with this new paradigm, it is indeed possible that blockchain technologies help to address current challenges triggered by the advent of social media and eventually enforce the *Disruption of the Stolen Model*.

Our research provides contributions to both research and practice in the sector of blockchain and journalism. By presenting blockchain as a possible solution approach to address the challenges of the current media crisis, the case study adds new evidence to the literature about blockchain 3.0. Moreover, we adopted a complementary conceptual perspective on the topic by combining Flichy's and Christensen's theories. With regard to Christensen's theory, we make three contributions: (1) presentation of a specific phenomenon called the *Disruption of the Stolen Model*; (2) examination of a double-entrant construct; (3) linkage of the disruptive potential of blockchain and possible strategies for its adoption and business model adaptation. Especially our six economic incentives could offer a starting point

for future work about the implementation of blockchain technologies in journalism by both academia and business practice.

However, our research has also some limitations that have to be taken into account when evaluating the findings of the case study.

7.2   Limitations

The limitations concern two elements of our research design: the composition of the interviewees, and the choice of the conceptual framework.

With regard to the interviewees, several issues have to be mentioned. First, the newsroom interviewees might have been prone to a potential bias. Since the Civil team put us in contact with the newsrooms, Civil knows which journalists participated in our study. Given the small number of newsroom interviewees, it is possible to derive from the context which newsroom shared which opinion. As the newsrooms use the services of Civil, they might not have been talked frankly about the challenges and risks they face as members of the Civil community. The fact that one journalist refused to talk explicitly about Civil strengthens this observation.

Probably even more importantly, the contrasting perspectives and opinions of the three journalists show that each newsroom has very different, individual experiences with the Civil platform and blockchain. These experiences might depend on the type, size and business model of the newsroom, the region or country the newsroom is operating, the personal or professional relationship with Civil, the antecedent use of or knowledge about blockchain, or the newsroom's role in the Civil community (active contributors, First Fleet newsroom, testers of Civil tools like Boosts, etc.).

Hence, we conclude that our study did not reach saturation with regard to the composition of our newsroom interviewees.

Moreover, we only interviewed journalism experts in Quebec who do not or do no longer work in the industry directly. Hence, it is possible that they omitted essential elements of the current business context that should be considered in the analysis about blockchain technologies. Journalists, editors or executives who are confronted with the industry's challenges every day could have provided additional, and maybe contradictory, insights. Furthermore, the experiences and testimonies of the experts only concern the Quebec journalism industry. Since the Quebec market is in many regards different from the Canadian market and that of other countries and regions (restricted size, high ownership concentration, language, relatively loyal audience), the findings from these interviews are not necessarily representative for the journalism industry in general and may not reflect the reality of journalists and news organizations outside of Quebec. In addition, the interviews with the Quebec experts delivered very hypothetical and prospective results. Although the goal of this study was to *explore* the promises, challenges and the disruptive potential of blockchain technologies for journalism, it is important to mention that the findings cannot serve as definitive and fixed theses, let alone as a new theory. What is more, the Quebec interviewees could have been biased because of the summary of the Civil case we sent them in advance as well as our explanations throughout the interviews about potential usage of blockchain technologies. Vice versa, the fact that we added additional explanations to our questions indicates that the summary might have been insufficient for creating an all-encompassing understanding of blockchain technologies in general and the Civil model in particular. In order to give the experts some impetus for the discussion, we sometimes risked putting "the words into their mouth" which already provided them with food for thought of how blockchain could be applied to journalism. Combined with the "wrap-up" character of our summary, it

is thus possible that we did not provide enough leeway for the emergence of other ideas, opportunities or perspectives.

Furthermore, there exist some limitations with regard to the conceptual framework. It has to be noted that the theory of disruptive innovation needs a specific interpretation when applied to the context of journalism. As highlighted in chapter 3, the journalism industry does not have the same characteristics as other business sectors. More importantly, Christensen's theory is exposed to strong criticism, especially for its "over-application". The complementarity of the two theories reinforces the limitation of the conceptual framework. By remaining close to the reality of journalism (i.e., conception as an industry continuously accompanied by technological disruptions), it is possible that during data analysis, we might have partially "forced" the phenomenon at hand into the conditions and the theoretical framework, restricting our field of vision to the disruptive, strategic and technological elements described by Flichy and Christensen.

Last but not least, we want to emphasize once again that Civil is a unique case of a start-up that is operating within the context of the US economy. The findings from our case study cannot necessarily be applied to other countries where the situation of the journalism industry and conditions for blockchain applications are different. Accordingly, it should be kept in mind for future research that the Civil case is limited to a specific setting and is by no means a generalizable template.

With these limitations in mind, we present some ideas for future research in the next section.

7.3   Ideas for future research

With this study, we made an attempt to couple the pitfalls of the journalism industry with the promises of blockchain technologies by thinking ahead the idea of Civil. However, future research will be necessary to develop a broader and deeper perspective on potential long-term implementations. For practically valuable research, we suggest not to focus on the technical foundations of blockchain technologies in isolation, but also to consider the history and business context of journalism, particularly the delicate relationship between journalism and technology. Even interdisciplinary studies combining media studies, management, economics, information technology or computer science are conceivable in this context.

The findings of our case study invite for different approaches how such research could be carried out. For example, it might be helpful to observe Civil over a longer time period in order to better capture the evolution of the project, or to add more viewpoints of participating newsrooms and various industry players (established national media companies, local newspapers, small online news outlets). This could be valuable to identify particularities that should be taken into account when implementing blockchain technologies in other news organizations with different profiles. Furthermore, it is possible to compare Civil with similar blockchain start-ups in media like Po.et, Publica or Steemit in order to explore diverse approaches of how to address challenges in blockchain-based projects. In a second step, the results could then be cross-validated to develop a diversified portfolio of opportunities and risks related to blockchain applications in the media sector.

When blockchain technologies and the Civil project will be more mature, cross-national and international research projects are imaginable as well. In view of the fact that Civil comprises a global community, it could be interesting to compare nations,

countries and regions with regard to their individual media landscape, their institutional and cultural characteristics, and the available leeway for blockchain projects. It might be of particular importance to examine how blockchain technologies can be implemented in regions where the freedom of the press is undermined or in danger, or where the use of cryptocurrencies is impeded or suppressed by the government. Moreover, cross-cultural and international comparative studies could consider the progress of blockchain projects and their level of disruption in different countries; intensity of research, blockchain investments, type and number of practical initiatives, pace of development or societal, economic and political interest and acceptance are examples of disruption parameters which could be examined.

Each single tool and paradigm of the Civil ecosystem provides enough material to form an own research project. Future researchers could focus on selected elements in order to examine their promises, challenges and implications for the journalism industry more in detail. This might facilitate news organizations the preparation of the testing phase. For example, it would be interesting to further explore self-governance models for journalism. As we have shown in our case study, the self-governance system plays a crucial role in the Civil ecosystem, and could introduce completely new forms of organizing inside newsrooms. One idea would be to further develop the question if blockchain networks can help to create common good news platforms in the Ostromian sense. Such research can be complemented by Orlikowski (2000) or Zammuto et al. (2007) which examined the dynamism, dimensions and consequences of inter-organizational adoption of technology. Such theories might be practical to further develop research about the two-dimensional paradigm shift, and to identify how blockchain could trigger the creation of new forms of organizing. In the same vein, future studies may put ethical issues and human factors at the center of the analysis; blockchain's impact on fake news, the democratization of journalism and the

mitigation of the ongoing social polarization deserve special attention in this regard. For example, it could be of interest to explore more in detail the concept of community by critically examining if the group of Civil members can truly be defined as a common type of community (e.g. community of practice, epistemic community, etc.). Researchers could focus on the characteristics of the Civil community that distinguish it from existing communities in journalism in order to discuss its value added for journalists and audiences. In addition to the idea to drive forward research about single blockchain elements, a more advanced approach could be to examine possible combinations of blockchain technologies with other emerging technologies like AI and machine learning, two innovations that are already considered for deployment in journalism.

Furthermore, in view of the finding that blockchain cannot be unambiguously identified as disruptive technologies and that Christensen's theory does not necessarily match with the journalism industry (see chapter 3), other, less classical theories might better apply to the analysis of the disruption and diffusion of blockchain. The application of other conceptual frameworks with similar theories could offer new perspectives on the implications of blockchain technologies in journalism. Langley (1999), for example, summarizes different strategies for the production of emerging theories, which could inspire future researchers to discover alternative research approaches in the field of blockchain. In order to detach from Christensen's widely (mis-)applied theory, scholars could address the topic by defining blockchain as a means to a *regeneration* or *rejuvenation* of the journalism industry. Such an approach could be especially promising in view of our finding that blockchain technologies are unlikely to create completely new business models, but can complement the existing model with disruptive elements. Moreover, in more advanced stages of blockchain projects, the implementation of the technologies could be examined through a more strategic lens, taking up and developing our economic

incentives, their effects and our suggestions for blockchain adoption and business model adaptation. Practical approaches as suggested by Osterwalder and Pigneur (2010), for instance, provide examples of how the adoption of blockchain in news organizations can be carried out more strategically. Especially the *Disruption of the Stolen Model* invites for more in-depth studies, for example in the field of strategic innovation management. The idea could be carried forward beyond the journalism industry and blockchain technologies in order to discover similar patterns in other business sectors. Such studies might shed light on the dynamics of the *Disruption of the Stolen Model* in a broader context, hence providing original perspectives for innovation management. Finally, whichever form complementary research will take, researchers should not walk into the black-or-white trap, i.e., a mindset which is either dominated by techno-determinism or technophobia. In order for research about blockchain and journalism to be sound, a highly nuanced spectrum of different ways of thinking is necessary. Even if the realization of blockchain ideals like decentralization, disintermediation and self-sovereignty slowly catches on and begins to penetrate journalism, thorough experiments and research will be needed to avoid leaping to hasty conclusions. Coming out with findings that deliver an all-encompassing view on promises, risks, challenges, implications and future progress of blockchain in journalism can help to unveil the real potential for the conflation of the two fields.

We conclude with a citation from Patrice Flichy that summarizes vividly the essence of our research: "The history of technology and its use is built upon three intertwined lines: chance, necessity and human will, both individual and collective[68]" (2003, p. 207, translated from French).

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[68] "L'histoire de la technique et de ses usages se construit selon trois lignes entremêlées : celles du hasard, de la nécessité et du vouloir humain, individuel et collectif."

APPENDIX A

INTERVIEW GUIDES

INTERVIEW GUIDE – CIVIL

Ice Breaker

- Your name is XYZ and your role at Civil is ABC. Could you tell us your principal tasks at Civil?
- What was your motivation to join Civil?

Tool / Feature	Topics to be addressed
Civil ecosystem	Successes and challenges as well as future plans of the Foundation, Council and Constitution
Self-governance	Experience with the vetting process (on the Civil and newsroom side); benefits/challenges of the token; governance of the code
Permanent archiving	Methods to ensure data protection and avoid manipulation; ways to encourage newsrooms to archive
Civil Boosts	Experience with first Boosts; improvements to be made in the future
Civil Discourse	Characteristics of new communication strategy; form of communication between Civil and newsrooms and among newsrooms
Community	Recruitment of newsrooms: how to ensure diversity and avoid exclusion; benefits to journalists

Smart contracts	User implication in the smart contracts: modifications, governance; challenges with regard to user experience; improvements made and to be made
CVL	Challenges with regard to regulation on the national and international level; measures to address those challenges
Decentralization	Ways that guarantee that third parties are kept "out of the equation"; role of Civil on the platform; purpose of central server
Funding model	Components (ConsenSys, micropayments, smart advertising, Civil Labs and Civil Studios); particularities of this model; differences to existing revenue models

Disruptive potential in Quebec/Canada

- Which requirements have to be fulfilled to facilitate the realization of the project, and what could be risks for potential new newsrooms? Think of legal, technical, economic, cultural and social aspects.

- Which potential challenges and opportunities would you anticipate in the Quebec or Canadian journalism industry? (structural, economic, political, socio-cultural aspects that differ from the American journalism industry)

- How could the integration of the Civil platform affect existing business structures of Quebec/Canadian media companies?

- In terms of their business profile, which players in the Quebec industry could be interesting target groups for Civil? (professional journalism vs. citizen journalism; pure online players vs. traditional newspapers; big vs. small media outlets)

Conclusion

- What are your expectations about Civil's future?
- Would you like to add any elements that you consider essential for the case study?

INTERVIEW GUIDE – NEWSROOMS

Ice Breaker

- What was your motivation to join Civil?

Civil tools & functionalities

- What did/do you expect from blockchain?
- Which Civil tools do you benefit from the most in your daily work, and which tools would you like to see in the future?
- Use of the Civil toolkit:
    - self-governance mechanisms
    - the community (relationship to Civil, other newsrooms and audiences)
    - the publishing function
    - Civil Boosts
    - Tokens and micropayments in general
- Their personal experience with these tools
- Major benefits and challenges they offer specifically to their newsroom
- Impact on the workflow and the daily business
- Recommendations for improvement

Disruptive potential

- Which requirements have to be fulfilled to facilitate the integration of a blockchain network in the workflow of a newsroom?
- Which risks do you see for a newsroom that is interested in using a blockchain network / a new applicant on the Civil platform?
- Which incentives would be required to attract news organizations to use blockchain technologies?

- In which respect do you think could blockchain technologies have a disruptive impact on the journalism industry?

Conclusion

- What are your expectations about the future of blockchain in journalism?
- Would you like to add any elements that you consider essential for the case study?

INTERVIEW GUIDE – EXPERTS IN QUEBEC

Question brise-glace

Avant notre invitation à l'entrevue, avez-vous déjà entendu parler des applications des technologies blockchain dans l'industrie du journalisme?

Crise du journalisme en général

- Quels sont les plus grands défis pour le journalisme aujourd'hui?

Fonctionnalités de Civil / blockchain: opportunités et défis

- Archivage permanent
- Smart contracts : p.ex. concessions de licences
- Microfinancement / Tokens
- Cryptomonnaies en général
- Communauté
- Auto-gouvernance

Intégration du modèle de Civil / d'un réseau blockchain dans l'industrie du journalisme

- D'un point de vue organisationnel, quels seraient les **risques** de l'intégration d'un réseau blockchain au sein d'un média? Pensez aux aspects techniques, stratégiques, opérationnels, culturels.
- D'un point de vue organisationnel, quelles seraient les **opportunités** de l'intégration d'un réseau blockchain au sein d'un média? Pensez aux aspects techniques, stratégiques, opérationnels, culturels.
- Comment pourrait l'intégration affecter le flux des opérations (*workflow*) d'un média?
- Quelles sont les différences entre les petits et les grands médias concernant l'intégration d'un modèle blockchain?

Potentiel disruptif

- Parmi les éléments que nous venons de discuter, lequel / lesquels pourraient d'après vous avoir le plus grand impact dans l'industrie du journalisme?
- Quelles sont les facteurs au sein de l'industrie qui empêchent l'adoption à grande échelle (*mainstream adoption*) des technologies blockchain présentement?
- Qu'est-ce qui devrait être fait afin de démontrer aux médias les promesses des technologies blockchain?

Dernières questions

- Quels sont vos attentes par rapport à l'avenir des technologies blockchain dans l'industrie du journalisme?
- Voulez-vous ajouter des éléments qui vous semblent particulièrement importants?

APPENDIX B

DOCUMENTS FOR RECRUITMENT – CIVIL

INVITATION LETTER

Dear Mr. Iles,

My name is Rosanna Schropp, I am a master's student in information technology at UQAM School of Management in Montreal and currently working on my master thesis about blockchain in journalism. I aim to explore the disruptive potential of blockchain technologies in the journalism industry in Quebec based on the Civil business case. The research project is supervised by Régis Barondeau, Ph.D., and Kerstin Kuyken, Ph.D., both assistant professors at the Department of Management and Technology of UQAM.

In fall 2018, our first investigations on the field drew our attention to Civil. As evidence about blockchain projects from practice is scarce, particularly in the journalism industry, the Civil platform represents an unprecedented project which in our opinion is of great interest for my study.

Our research objective is to identify opportunities and challenges of a blockchain platform for journalism based on the practical business case of Civil and subsequently to examine the potential of similar implementations in the news industry in Quebec. For this purpose, we first would like to carry out a case study about Civil, by analyzing its evolution, business practices, and role in the news industry.

In this context, we would like to invite Civil to participate in the research project by exchanging about your project in some face-to-face interviews.

In order to get a feeling for the Civil business spirit, we would plan a journey to New York in summer 2019. We would like to talk to some of your employees who are willing to share their experience with the Civil platform. The direct contact with your business and the people who make up the project would allow us to realize a comprehensive case study.

We are especially interested in relevant issues like opportunities, achievements, limits, risks, etc. that you have been facing since the launch of Civil. With regard to potential comparable projects in the journalism industry in Quebec, we would like to focus on the impact of blockchain technologies from strategic, technical, operational and cultural angles.

Back in Montreal, the second step of our research will then be to explore the disruptive potential of blockchain technologies in the journalism industry in Quebec by capturing the viewpoints of local experts. The Civil case would build the practical basis for this part of the research: as starting point for the discussion, we would submit a short summary of the Civil case to the experts who are then invited to evaluate the potential of comparable projects in the news industry in Quebec.

Your participation in the study would allow us to gain valuable insights into the business practice of Civil which an external analysis would not be able to deliver. You would help us to assess the potential of future blockchain projects outside the United States, and popularize Civil and its innovative business across the borders.

Given Civil's pioneering role in linking blockchain to journalism, your contribution would considerably enrich this research project. We would thus highly appreciate your participation.

If you have any questions, do not hesitate to contact us:
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We are looking forward to hearing from you soon.
Best regards,
Rosanna Schropp

APPENDIX C

DOCUMENTS FOR RECRUITMENT – NEWSROOMS

INVITATION LETTER

Dear Mr./Mrs. XX,

As YY [Civil team member] already mentioned, I'm a masters student from the University of Quebec in Montreal and I'm writing my master thesis about the potential of blockchain technologies in the journalism industry. Based on the business case of Civil, I want to find out if and how blockchain could disrupt the journalism industry here in Quebec.

After having talked to the Civil team in New York, I would now like to carry out some remote interviews of approximately 30-40 minutes with newsrooms about their experience with the Civil platform. It would be great to include you in the research project in order to conduct a comprehensive case study that also considers the perspective of the platform users.

Please find attached a short summary of the project explaining more in detail which aspects the interviews would cover. I also send you the letter of consent explaining the modalities of the interview. The interview would be recorded, but your identity would never be disclosed. (If you want to participate, it would be great if you could sign the letter (digitally) and send it back to me before the interview.)

If you are interested in participating, let me know when you would be available.

I would then send you a Zoom link.

I would be very pleased about your participation!

Best regards from Montreal,

Rosanna Schropp

SUMMARY OF THE RESEARCH PROJECT

Blockchain in journalism - potential for disruption?
A case study about Civil in New York and the journalism industry in Quebec

This study aims to identify the promises of blockchain technologies for the journalism industry in general by examining the case of Civil, and subsequently to evaluate the disruptive potential of the project for the journalism industry in Quebec in particular.

With regard to the claim that blockchain technologies have the power to disrupt certain industries, we are particularly focusing on the potential for disruption of Civil's business idea. The specific interest of the study to reveal the potential of blockchain technologies for the journalism industry in Quebec is rooted in the fact that the Quebec press - as many other countries - could not evade the current "crisis".

The first phase of the methodology consists of collecting public documentation about Civil (Civil's white paper and constitution, press releases, publications of and about Civil, articles on online news websites, videos, tweets, posts, etc.). In addition, as we want to analyze the business case of Civil beyond the publicly available information about the company, we would like to conduct 3-4 interviews with Civil's employees and 2-3 with Civil newsrooms.

The interviews with the newsrooms would allow us to understand

- for which reasons they decided to use the Civil platform;
- the benefits and challenges for newsrooms using the Civil platform;
- how using the Civil platform affected their journalistic work and their business structure;
- what they expect from their participation in the project (e.g. which tools or functions they would like to see in the Civil ecosystem in the future);
- what they expect from blockchain technologies;

- which limits, risks and local particularities should be taken into account when participating in the project;

- which legal, technical, economic, cultural and social requirements have to be fulfilled to facilitate the integration of the platform (policies, laws, acceptance among readers and journalists, etc.);

- in which manner the project could disrupt the journalism industry (i.e., to which extent it could have an impact on existing business models, the relationship between readers and journalists, etc.).

This first phase serves as a practical basis for the second phase which consists of interviews with experts in the Quebec journalism industry to whom we will expose the findings from the analysis of Civil. While the analysis allows us to better understand business implications of Civil's business model, it might at the same time help experts in Quebec to imagine possible impacts in the local journalism industry. The goal of the study is to provide a comprehensive analysis of opportunities and risks of blockchain applied to the news industry in Quebec. According to our current state of knowledge, there exist only a few business cases so far making use of blockchain networks for journalistic purposes. The contribution of this work is hence to enrich research about blockchain technologies in the application field of journalism where evidence from both business and academia is lacking.

APPENDIX D

DOCUMENTS FOR RECRUITMENT – EXPERTS IN QUEBEC

INVITATION LETTER

Bonjour,

Je m'appelle Rosanna Schropp, je suis étudiante à la maîtrise en technologies de l'information à l'école des sciences de la gestion de l'UQÀM et je travaille présentement sur mon mémoire qui porte sur le potentiel disruptif des technologies blockchain dans l'industrie du journalisme. Le mémoire est supervisé par Régis Barondeau, Ph.D. et Kerstin Kuyken, Ph.D., les deux professeurs adjoints au département de management et technologie de l'UQÀM.

Notre objectif de recherche est d'identifier les opportunités et les défis d'un réseau blockchain pour le journalisme au Québec basé sur le cas de Civil, une start-up américaine qui a développé une plateforme journalistique en utilisant un réseau blockchain. **Vous trouverez ci-joint un résumé afin de vous donner une idée plus concrète des technologies blockchain appliquées au journalisme, ainsi que du projet de Civil.**

Dans ce contexte, je vous invite à participer à cette recherche en échangeant avec moi au sujet des opportunités et des défis de l'intégration d'un réseau blockchain dans le journalisme québécois. Votre participation prendrait la forme d'une entrevue d'une durée approximative de 60 minutes. Il vous sera demandé pendant cet entretien de partager votre opinion par rapport au potentiel des technologies blockchain pour la presse écrite au Québec. Durant l'entrevue, nous aborderons l'impact des technologies blockchain sur l'industrie du journalisme locale sous différents angles : stratégiques,

techniques (une connaissance pointue des technologies blockchain n'est pas nécessaire), opérationnels et culturels.

Notre entrevue prendra la forme d'un échange ouvert et consenti. En tout temps, vous aurez la liberté d'accepter de participer ou pas, et de choisir ce que vous avez envie de partager avec moi. Vous pourrez donc à n'importe quel moment refuser de répondre à une question ou suspendre l'entrevue. Les données qui auront été recueillies seront détruites une fois l'étude complétée et les articles publiés. De plus, l'entrevue sera enregistrée avec votre accord. Vous aurez la garantie de confidentialité qui prendra la forme d'un document de consentement cosigné. Votre nom ou identité ne pourra à aucun moment être divulgué. L'accès aux données sera exclusivement réservé à la chercheuse, au directeur et à la codirectrice du projet de recherche. Étant donné votre expérience et vos connaissances dans le domaine, votre participation nous permettra d'effectuer une analyse rigoureuse et d'évaluer le potentiel disruptif des technologies blockchain du point de vue d'un(e) expert(e) du journalisme local. Sachez que votre contribution à ce projet de recherche sera grandement appréciée, car elle saura enrichir considérablement les connaissances générales du milieu et de l'enjeu concerné.

Si vous avez des questions, n'hésitez pas à nous contacter :

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Au plaisir d'avoir de vos nouvelles bientôt.
Cordialement,
Rosanna Schropp

SUMMARY OF THE RESEARCH PROJECT

Projet de recherche :
Les technologies blockchain dans l'industrie du journalisme

« Le journalisme est en crise » - cette phrase est désormais devenue partie intégrante du débat sur le statu quo de l'industrie. L'avènement de l'ère numérique a sérieusement bouleversé le journalisme traditionnel en déclenchant une série de changements sur le plan organisationnel, structurel, économique, stratégique et socioculturel. L'industrie du journalisme au Québec n'échappe pas à ce phénomène, tel qu'à démontré tout récemment le cas de Groupes Capitales Médias. Face à ces défis, il est primordial de penser l'ère numérique comme une période de renaissance (Curran, 2010) afin de trouver et ensuite démocratiser des approches alternatives et viables. Dans cet esprit, la start-up new-yorkaise Civil (https://civil.co/) occupe un rôle de pionnier : elle tente d'exploiter le potentiel des technologies blockchain - une des technologies émergentes les plus discutées présentement - pour aborder les principaux maillons faibles du journalisme d'aujourd'hui.

Bien que les technologies soient particulièrement connues pour leur application en lien avec des cryptomonnaies telles que Bitcoin, les grandes compagnies dans l'industrie du journalisme commencent également à s'y intéresser : En juillet 2019, la New York Times a annoncé qu'elle allait tester un réseau blockchain pour lutter contre la désinformation dans le cadre du News Provenance Project (pour plus de détails, cliquer ici).

Mais qu'est-ce que les technologies blockchain ? Ces technologies offrent une nouvelle promesse pour les partisans d'un Web décentralisé. D'un point de vue général, elles visent à éliminer les intermédiaires qui contrôlent des transactions commerciales en créant un réseau distribué gouverné uniquement par ses pairs. La nature indélébile, immuable et sécurisée des réseaux blockchain grâce aux horodateurs (time stamps) et l'imbrication des blocs d'information permet de faciliter la traçabilité des transactions ainsi que la preuve et le transfert de propriété. Cela crée une « vérité commune ». Dans l'industrie du journalisme, un réseau blockchain pourrait aider à mettre en place un archivage sécurisé et fiable, une protection optimisée des droits d'auteur, des modèles de financements alternatifs, la désintermédiation des structures organisationnelles ainsi que des pistes pour rétablir la confiance entre les lecteurs et les journalistes.

Civil, quant à elle, a lancé en juin 2018 une plateforme journalistique soutenue par un réseau blockchain qui permet de créer des salles de rédaction où les journalistes peuvent publier indépendamment de l'influence de structures centralisées. Les deux promesses principales du modèle sont l'archivage permanent des droits d'auteur et du contenu ainsi que l'auto-gouvernance de la plateforme.

La plateforme est comparable au modèle Wikipédia où une grande importance est accordée à la communauté. Un petit groupe assure le fonctionnement de la plateforme pour un plus grand public : ils administrent un registre (Civil Registry) qui regroupe l'ensemble des salles de rédaction approuvées. Grâce à une cryptomonnaie interne appelée CVL, ce groupe peut participer à une procédure de vote qui est destinée à garantir une haute qualité de journalisme.

Par exemple, il est possible qu'une salle de rédaction n'opère pas dans des buts journalistiques, mais à des fins publicitaires. Dans ce cas, un membre de la communauté peut miser des tokens (de la cryptomonnaie) pour soutenir que la salle est invalide. Par la suite, le reste de la communauté va voter à l'aide de leurs tokens pour accepter ou refuser la proposition. Un vote majoritaire est requis pour la décision finale. Si la salle de rédaction a réellement des faiblesses sur le plan éthique, elle sera supprimée du registre et le membre qui a initié le défi sera récompensé pour ses démarches. Dans le cas contraire, la salle demeurera dans le registre et le membre perdra sa mise. Un conseil (Civil Council) formé par des membres indépendants (journalistes experts dans l'industrie) peut intervenir si la communauté n'arrive pas à parvenir à un consensus. Les directives éthiques et éditoriales pour les journalistes sont fixées dans une constitution (Civil Constitution) qui est co-créée par la communauté et le public. Toutefois, les mécanismes de contrôle ne touchent pas à l'indépendance éditoriale des salles de rédaction. Elles gardent leurs propres sites web, déterminent leurs sources de revenus et décident des thèmes de leurs reportages. Un petit symbole sur le site web indique que le journal participe au projet Civil et que la qualité de son contenu est donc soumise au contrôle continu de la communauté.

En plus de ce système d'auto-gouvernance, Civil souhaite créer un écosystème d'outil qui vise notamment à bénéficier à de petites et moyennes salles de rédaction. Jusqu'à présent, Civil a développé trois outils principaux :

- Civil Publisher : une extension Word Press permettant de sauvegarder des articles de manière permanente et inaltérable sur le réseau blockchain Ethereum ;
- Civil Boost : une fonctionnalité facilitant le micro-financement de projets journalistiques concrets ;
- Civil Discourse : un forum de discussion public offrant à la communauté la possibilité d'échanger sur des sujets critiques.

De plus, un outil permettant de licencier du contenu de façon transparente est en train d'être élaboré en collaboration avec l'Associated Press.

De mars à septembre 2019, 60 salles de rédaction provenant de 4 continents se sont jointes à la plateforme de Civil, notamment des États-Unis, de l'Amérique du Sud, de l'Europe de l'Est et de l'Asie du Sud-Est. Une seule salle de rédaction canadienne participe au projet. Civil s'adresse particulièrement aux petites et moyennes entreprises spécialisées en journalisme local, international, d'enquête et dans le domaine des politiques publiques. Une fondation (Civil Foundation) est responsable de recruter de nouvelles salles de rédaction, de superviser l'évolution de la constitution, d'assister les journalistes participants, et également d'allouer des subventions.

Malgré l'avancement du projet, quelques questions restent cependant ouvertes. Est-ce qu'un tel modèle offre réellement un potentiel disruptif, c'est-à-dire est-ce qu'il peut vraiment bouleverser le journalisme tel qu'on le connaît ? Quels sont les risques ? Quelles sont les opportunités de la plateforme de Civil pour l'industrie du journalisme au Québec ? Est-ce que les technologies blockchain pourraient aider à aborder les grands défis auxquels l'industrie fait face présentement? Avec votre participation, nous visons entre autres à répondre à ces questions et à explorer le potentiel du projet de Civil pour les salles de rédaction québécoises.

APPENDIX E

ETHICS CERTIFICATION

UQÀM | Comités d'éthique de la recherche
avec des êtres humains

CERTIFICAT D'APPROBATION ÉTHIQUE

Le Comité d'éthique de la recherche pour les projets étudiants impliquant des êtres humains (CERPE plurifacultaire) a examiné le projet de recherche suivant et le juge conforme aux pratiques habituelles ainsi qu'aux normes établies par la *Politique No 54 sur l'éthique de la recherche avec des êtres humains* (Janvier 2016) de l'UQAM.

Titre du projet:	Blockchain in journalism: potential for disruption? - A case study about The Civil Media Company in New York and the journalism industry in Quebec
Nom de l'étudiant:	Rosanna SCHROPP
Programme d'études:	Maîtrise ès sciences (technologie de l'information) (profil avec mémoire)
Direction de recherche:	Régis BARONDEAU
Codirection:	Kerstin KUYKEN

Modalités d'application

Toute modification au protocole de recherche en cours de même que tout événement ou renseignement pouvant affecter l'intégrité de la recherche doivent être communiqués rapidement au comité.

La suspension ou la cessation du protocole, temporaire ou définitive, doit être communiquée au comité dans les meilleurs délais.

Le présent certificat est valide pour une durée d'un an à partir de la date d'émission. Au terme de ce délai, un rapport d'avancement de projet doit être soumis au comité, en guise de rapport final si le projet est réalisé en moins d'un an, et en guise de rapport annuel pour le projet se poursuivant sur plus d'une année. Dans ce dernier cas, le rapport annuel permettra au comité de se prononcer sur le renouvellement du certificat d'approbation éthique.

Raoul Graf
Président du CERPE plurifacultaire
Professeur, Département de marketing

BIBLIOGRAPHY

Addo-Quaye, R., & Fielt, E. (2019). A Literature Review on the Relationship between Disruption and Business Model Innovation: What Choices do Incumbents have? *Australasian Conference on Information Systems*, 829-839.

Aguigah, R. (2018). Zusammenleben mit nervösen Medien. *Deutschlandfunk Kultur*. Retrieved from https://www.deutschlandfunkkultur.de/soziologe-dirk-baecker-ueber-digitalisierung-zusammenleben.2162.de.html?dram:article_id=431636

Al-Saqaf, W., & Edwardsson, M. P. (2020). Could blockchain save journalism? An explorative study of blockchain's potential to make journalism a more sustainable business. In M. Ragnedda & G. Destefanis (Eds.), *Blockchain and Web 3.0: Social, Economic, and Technological Challenges* (pp. 97-113). London and New York: Routledge.

Association des journalistes indépendants du Québec. (2019). Les réalités du métier. Retrieved from https://www.ajiq.qc.ca/sur-le-journalisme-independant/les-realites-du-metier/

Bélair-Cirino, M. (2019). Une aide de 50 millions par année pour la presse écrite. *Le Devoir*. Retrieved from https://www.ledevoir.com/culture/medias/563898/aide-aux-medias-quebec

Bilton, R. (2017). Civil, the blockchain-based journalism marketplace, is building its first batch of publications. *NiemanLab*. Retrieved from https://www.niemanlab.org/2017/10/civil-the-blockchain-based-journalism-marketplace-is-building-its-first-batch-of-publications/

Bitcoin Average. (2019). Global Bitcoin Price Index (GBX). Retrieved from https://bitcoinaverage.com/fr/bitcoin-price/btc-to-usd

Bittner, A. K. (2019). *Digital Journalism & New Business Models*. Retrieved from https://www.lamira.cat/documents/02-2019-efj-report-digital-journalism-and-new-business-models.pdf

Blockchain France. (2016). *La Blockchain décryptée: Les clefs d'une révolution*. Retrieved from https://blockchainfrance.files.wordpress.com/2018/06/la-blockchain-decc81cryptecc81e-les-clefs-dune-recc81volution.pdf

Blockchain.com. (2020). Blockchain Size (MB). Retrieved from https://www.blockchain.com/en/charts/blocks-size

Bogner, A., Littig, B., & Menz, W. (2009). Introduction: Expert Interviews – An Introduction to a New Methodological Debate. In A. Bogner, B. Littig, & W. Menz (Eds.), *Interviewing Experts* (pp. 1–16). Basingstoke: Palgrave Macmillan.

Bower, J. L., & Christensen, C. M. (1995). Disruptive Technologies: Catching the Wave. *Harvard Business Review*, 43-53.

Brin, C., Charlton, S., & Leclair, K. (2019). *Digital News Report Canada: 2019 Data: An Overview*. Retrieved from https://www.cem.ulaval.ca/wp-content/uploads/2019/06/dnr19_can_eng.pdf

Brin, C., & Soderlund, W. (2010). Innovating in a Crisis: Canadian Media Actors Assess the State of Convergence. *Canadian Journal of Communication, 35*(4), 575-583. Retrieved from https://www.cjc-online.ca/index.php/journal/article/view/2380/2214

Brin, C., & St-Pierre, M. (2013). *Crise des médias et effectifs rédactionnels au Québec*. Sainte-Foy: Centre d'études sur les médias.

Bromwich, J. E. (2018). Alas, the Blockchain Won't Save Journalism After All. *The New York Times*. Retrieved from https://www.nytimes.com/2018/11/01/style/blockchain-journalism-civil.html

Bustillos, M. (2018). Popula Makes History. *Popula*. Retrieved from https://popula.com/2018/12/17/popula-makes-history/

Buterin, V. (2014). *Ethereum White Paper: A Next Generation Smart Contract & Decentralized Application Platform*. Retrieved from https://blockchainlab.com/pdf/Ethereum_white_paper-a_next_generation_smart_contract_and_decentralized_application_platform-vitalik-buterin.pdf

Cambridge Dictionary. (2020). paradigm shift. Retrieved from https://dictionary.cambridge.org/de/worterbuch/englisch/paradigm-shift

Carey, J. W. (2007). A Short History of Journalism for Journalists: A Proposal and Essay. *The International Journal of Press/Politics, 12*(1), 3-16. doi:10.1177/1081180X06297603

Catalini, C., & Gans, J. S. (2018). Some Simple Economics of the Blockchain. *National Bureau of Economic Research*. Retrieved from http://www.nber.org/papers/w22952

Centre d'études sur les médias. (2019). Presse quotidienne. Retrieved from https://www.cem.ulaval.ca/publics/portraits_sectoriels/presse-quotidienne/

Chamber of Digital Commerce Canada. (2019). *Canadian Blockchain Census 2019: Part I: Measuring Canada's Blockchain Ecosystem*. Retrieved from https://www.blockchainresearchinstitute.org/wp-content/uploads/2019/10/Chamber-BlockchainCensus-2019.pdf

Charitou, C. D., & Markides, C. (2003). Responses to Disruptive Strategic Innovation. *MIT Sloan Management Review, 44*(2), 54-63.

Chomsky, N., & McChesney, R. W. (2004). *Propagande, médias et démocratie*. Montréal: Écosociété.

Chouinard, T. (2019a). Capitales Médias : Québec opte pour le modèle coop. *La Presse*. Retrieved from https://www.lapresse.ca/affaires/medias/201911/19/01-5250295-capitales-medias-quebec-opte-pour-le-modele-coop.php

Chouinard, T. (2019b). Groupe Capitales Médias: les coffres seraient vides dès la mi-novembre. *La Presse*. Retrieved from https://www.lapresse.ca/actualites/201908/21/01-5238228-groupe-capitales-medias-les-coffres-seraient-vides-des-la-mi-novembre.php

Christensen, C. M. (1999). *Innovation and the general manager*. Boston, Massachusetts: Irwin/McGraw-Hill.

Christensen, C. M. (2006). The Ongoing Process of Building a Theory of Disruption. *Journal of Product Innovation Management, 23*, 39-55.

Christensen, C. M. (2016). *The innovator's dilemma: When new technologies cause great firms to fail*. Boston, Massachusetts: Harvard Business Review Press.

Christensen, C. M., Raynor, M. E., & McDonald, R. (2015). What Is Disruptive Innovation? *Harvard Business Review*. Retrieved from https://hbr.org/2015/12/what-is-disruptive-innovation#

Christensen, C. M., Skok, D., & Allworth, J. (2012). Breaking News: Mastering the art of disruptive innovation in journalism. *Nieman Reports, 66*(3), 6-20. Retrieved from https://niemanreports.org/articles/breaking-news/

Civil. (2017a). Civil Announces $5 Million In Funding From ConsenSys. Retrieved from https://medium.com/@Join_Civil/civil-announces-5-million-in-funding-from-consensys-6e526b261ee5

Civil. (2017b). The Civil Cryptoeconomic Whitepaper. Retrieved from https://medium.com/@Join_Civil/the-civil-cryptoeconomic-whitepaper-1a42a7ff038d

Civil. (2017c). Civil: Self-Sustaining Journalism. Retrieved from https://medium.com/@Join_Civil/civil-self-sustaining-journalism-a5caa49005c3

Civil. (2018a). The Civil Constitution. Retrieved from https://learn.civil.co/constitution/#constitution

Civil. (2018b). Civil web page. Retrieved from https://web.archive.org/web/20180905035421/https://civil.co/

Civil. (2018c). The Civil white paper. Retrieved from https://civil.co/white-paper/

Civil. (2018d). Help and Support. Retrieved from https://web.archive.org/web/20180804020914/https://civil.co/help/

Civil. (2018e). How to launch a newsroom. Retrieved from
https://web.archive.org/web/20180629032959/https://civil.co/how-to-launch-newsroom/#civil-registry

Civil. (2018f). Welcome to the CVL token sale. Retrieved from
https://web.archive.org/web/20181018230956/https://civil.co/wp-content/themes/join-civil/src/static/cvl/intro_to_cvl_token_sale.pdf

Civil. (2018g). Who We Are. Retrieved from
https://web.archive.org/web/20180918050945/https://civil.co/

Civil. (2019a). *Boosts*. Retrieved from https://help.civil.co/hc/en-us/categories/360001939731-Boosts

Civil. (2019b). Civil Community Discussion Forum Proposal. Retrieved from
https://docs.google.com/document/d/1Qy7ocCSPuZivuxySZUZ1CVCjU69Oq
HjQYox9UJpPJjo/edit#heading=h.d2lcd93i4e8x

Civil. (2019c). The Civil Foundation. Retrieved from https://civilfound.org/

Civil. (2019d). The Civilian: Issue 02, Second Edition. Retrieved from
https://mailchi.mp/52223610d38b/the-civilian-issue-2

Civil. (2019e). The Civilian: Issue 04, First Edition. Retrieved from
https://mailchi.mp/f389501c30dc/the-civilian-issue-4

Civil. (2019f). The Civilian: Issue 12, First Edition. Retrieved from
https://mailchi.mp/19b17243f622/the-civilian-issue-12

Civil. (2019g). Help Civil. Retrieved from https://help.civil.co/hc/en-us

CoinGecko. (2019). Civil (CVL). Retrieved from
https://www.coingecko.com/de/munze/civil

Coolidge, M. (2018). Civil and The Associated Press to Collaborate on Blockchain-Based Content Licensing. Retrieved from https://blog.joincivil.com/civil-and-the-associated-press-to-collaborate-on-blockchain-based-content-licensing-c7211f5ae7fa

Corbin, J., & Strauss, A. (2015). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (4th ed.). Thousand Oaks, California: SAGE Publications.

Cornia, A., Sehl, A., & Nielsen, R. K. (2020). 'We no longer live in a time of separation': A comparative analysis of how editorial and commercial integration became a norm. *Journalism, 21*(2), 172-190. doi:https://doi.org/10.1177/1464884918779919

Cozzolino, A., Verona, G., & Rothaermel, F. T. (2018). Unpacking the Disruption Process: New Technology, Business Models, and Incumbent Adaptation. *Journal of Management Studies, 55*, 1166-1202. doi:10.1111/joms.12352

Crowther, C., Thibault, S., Salamon, E., & King, G. (2016). Introduction: Whose Crisis? Journalism Is Not Just for Journalists and Policy Is not Just for Wonks. In M. Gasher, C. Brin, C. Crowther, G. King, E. Salamon, & S. Thibault (Eds.), *Journalism in Crisis - Bridging Theory and Practice for Democratic Media Strategies in Canada* (pp. 3-26). Toronto: University of Toronto Press.

CryptoIndex. (2019). Bitcoin (BTC): Historic Price Trends. Retrieved from https://cryptoindex.world/crypto-currencies/bitcoin

CSA. (2017). The Canadian Securities Administrators Launches A Regulatory Sandbox Initiative [Press release]. Retrieved from https://www.securities-administrators.ca/aboutcsa.aspx?id=1555&terms=Regulatory%20Sandbox%20Initiative

Cuen, L. (2018). Employees Say Startup Civil Hyped Crypto Returns, But Failed to Pay. *Coindesk*. Retrieved from https://www.coindesk.com/civil-startup-token-crypto-ethereum

Curran, J. (2010). The Future of Journalism. *Journalism Studies, 11*(4), 464-476. doi:10.1080/14616701003722444

Dale, B. (2018). Take 2: News Startup Civil Announces Rebooted Token Sale for February. *Coindesk*. Retrieved from https://www.coindesk.com/take-2-news-startup-civil-announces-rebooted-token-sale-for-february

Danneels, E. (2004). Disruptive Technology Reconsidered: A Critique and Research Agenda. *Journal of Product Innovation Management, 21*, 246-258.

De Filippi, P. (2018). *Blockchain et cryptomonnaies*. Paris: Presses universitaires de France.

De Filippi, P., McMullen, G., McConaghy, T., Choi, C., La Rouvière, S., Benet, J., & Stern, D. J. (2016). How Blockchains can support, complement, or supplement intellectual property: Working draft. *Coalition of Automated Legal Applications*. Retrieved from https://github.com/COALAIP/specs/blob/master/presentations/COALA%20IP%20Report%20-%20May%202016.pdf

De Filippi, P., & Wright, A. (2018). *Blockchain and the Law*. Cambridge, Massachusetts: Harvard University Press.

De Silva, M. (2018). The crypto token that wants to save journalism is offering refunds. *Quartz*. Retrieved from https://qz.com/1426382/consensys-bought-most-of-the-cvl-tokens-in-civil-medias-disappointing-ico/

Denzin, N. K., & Lincoln, Y. S. (Eds.). (1994). *Handbook of Qualitative Research* (Second ed.). Thousand Oaks, California: Sage Publications.

Digiconomist. (2018). Bitcoin Energy Consumption Index. Retrieved from https://digiconomist.net/bitcoin-energy-consumption

Dillon, K. (Ed.) (2020). *Disruption 2020: What it will take to innovate and compete over the next decade*: MIT Sloan Management Review.

Drescher, D. (2017). *Blockchain basics: A non-technical introduction in 25 steps*. New York: Apress.

Erkkilä, M. (2019). *What use is blockchain for journalism?* Retrieved from http://www.lse.ac.uk/media-and-communications/assets/documents/research/Blockchain-POLIS-Report-Jan-2019.pdf

Farivar, C. (2018). Civil unrest: How a blockchain-based journalism startup bumbled its launch. *Ars Technica*. Retrieved from https://arstechnica.com/tech-policy/2018/12/civil-unrest-how-a-blockchain-based-journalism-startup-bumbled-its-launch/

Fickers, A. (2014). "Neither good, nor bad, nor neutral": The Historical *Dispositif* of Communication Technologies. In M. Schreiber & C. Zimmermann (Eds.), *Journalism and Technological Change: Historical Perspectives, Contemporary Trends* (pp. 30-52). Frankfurt am Main: Campus Verlag.

Fidler, R. (1997). *Mediamorphosis: Understanding New Media*. Thousand Oaks: SAGE Publications.

Flichy, P. (2003). *L'innovation technique: Récents développements en sciences sociales, vers une nouvelle théorie de l'innovation*. Paris: Éditions La Découverte.

Fluree PBC. (2018). Blockchain for 2018 and Beyond: A (growing) list of blockchain use cases. Retrieved from https://medium.com/fluree/blockchain-for-2018-and-beyond-a-growing-list-of-blockchain-use-cases-37db7c19fb99

Forbes. (2018). Forbes Becomes First Major Media Brand to Experiment with Publishing on Civil Platform. Retrieved from https://www.forbes.com/sites/forbespr/2018/10/09/forbes-becomes-first-major-media-brand-to-experiment-with-publishing-on-civil-platform/#595d982177c1

Fortin, M.-F. (2000). L'analyse qualitative des données. In R. Mayer (Ed.), *Méthodes de recherche en intervention sociale* (pp. 457–480). Boucherville: Gaetan Morin.

Freydag, N., & Schmiese, W. (2018). Zeitungen in Not: Was ist uns Journalismus noch wert? [Television Broadcast]. *ZDF Zoom*. Retrieved from https://www.zdf.de/dokumentation/zdfzoom/zdfzoom-zeitungen-in-not-100.html

Future Today Institute. (2019). *2019 Trend Report For Journalism, Media and Technology*. Retrieved from https://futuretodayinstitute.com/2019-journalism-media-tech-trends/

Gallup/Knight Foundation. (2018a). *American Views: Trust, Media and Democracy*. Retrieved from https://knightfoundation.org/reports/american-views-trust-media-and-democracy

Gallup/Knight Foundation. (2018b). *Indicators of News Media Trust*. Retrieved from https://knightfoundation.org/reports/indicators-of-news-media-trust/

Gasher, M., Brin, C., Crowther, C., King, G., Salamon, E., & Thibault, S. (Eds.). (2016). *Journalism in Crisis - Bridging Theory and Practice for Democratic Media Strategies in Canada*. Toronto: University of Toronto Press.

Giroux, D. (2015). *État de la concentration de la propriété des médias d'information de langue française au Québec*. Retrieved from https://www.cem.ulaval.ca/wp-content/uploads/2019/04/etatconcentration.pdf

Griffith, A. T. (2019). (>'-')> Kirby: a single-line web3 abstraction and bottom-up identity solution. Retrieved from https://medium.com/@austin_48503/kirby-32491315c5

Haber, S., & Stornetta, W. S. (1991). How to Time-Stamp a Digital Document. *Journal of Cryptology, 3*(2), 99–111. Retrieved from https://link.springer.com/article/10.1007/BF00196791

Habtay, S. R., & Holmén, M. (2014). Incumbents responses to disruptive business model innovation: The moderating role of technology vs. market-driven innovation. *International Journal of Entrepreneurship and Innovation Management, 18*(4), 289-309.

Halaburda, H. (2018). Blockchain Revolution Without the Blockchain. *Communications of the ACM, 61*(7), 27-29. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3133313

Hawlitschek, F., Notheisen, B., & Teubner, T. (2018). The limits of trust-free systems: A literature review on blockchain technology and trust in the sharing economy. *Electronic Commerce Research and Applications, 29*, 50–63. doi:10.1016/j.elerap.2018.03.005

Hermida, A., & Young, M. L. (2019). *Data Journalism And The Regeneration of News*. Abingdon and New York: Routledge Focus.

Hernandez Serrano, M. J., Greenhill, A., & Graham, G. (2015). Transforming the news value chain in the social era: A community perspective. *Supply Chain Management: An International Journal, 20*(3), 313–326. doi:10.1108/SCM-05-2014-0147

Hess, C., & Ostrom, E. (2007). Introduction: An Overview of the Knowledge Commons. In C. Hess & E. Ostrom (Eds.), *Understanding Knowledge as a Commons: From Theory to Practice* (pp. 3-26). Cambridge, MA: The MIT Press.

Hinman, W. (2018). Digital Asset Transactions: When Howey Met Gary (Plastic). *U.S. Securities and Exchange Commission*. Retrieved from https://www.sec.gov/news/speech/speech-hinman-061418

Howle, J. (2018). CIVIL, UX, Failure, Bravery. Retrieved from https://medium.com/@jonnyhowle/civil-ux-failure-bravery-2910a30db4ca

Iansiti, M., & Lakhani, K. R. (2017). The Truth About Blockchain. *Harvard Business Review, 95*(1), 1-11. Retrieved from https://hbr.org/2017/01/the-truth-about-blockchain

Iivari, J. (2010). Twelve Theses on Design Science Research in Information Systems. In A. Hevner & S. Chatterjee (Eds.), *Design Research in Information Systems* (Vol. 22, pp. 43–62). Boston, Massachusetts: Springer US.

Iles, M. (2016). Journalism Needs A New Business Model. Retrieved from https://medium.com/@matthewiles/journalism-needs-a-new-business-model-9d1d78a68981

Iles, M. (2018a). The Civil Token Sale's Eleventh Hour. Retrieved from https://blog.joincivil.com/the-civil-token-sales-eleventh-hour-5187e971a3d2

Iles, M. (2018b). Civil: A Bold Rebuke to the Status Quo. Retrieved from https://blog.joincivil.com/civil-a-bold-rebuke-to-the-status-quo-83444b5911d8

Iles, M. (2018c). The CVL Token Sale Will Begin September 18 — Here's Why. Retrieved from https://blog.joincivil.com/the-cvl-token-sale-will-now-begin-september-18-heres-why-5ec1257ce4c2

Iles, M. (2018d). How The Civil Media Company Makes Money, And Why It's Good for Journalism. Retrieved from https://blog.joincivil.com/how-does-the-civil-media-company-make-money-and-why-is-it-good-for-journalism-34b4a6616256

Iles, M. (2018e). The Next Chapter For Civil. Retrieved from
    https://blog.joincivil.com/the-next-chapter-for-civil-49e0a3b2d4c6

Iles, M. (2018f). The Waterline: How Civil Works. Retrieved from
    https://blog.joincivil.com/the-waterline-how-civil-works-8cb4f63a36ee

Iles, M. (2019a). Boosts: From Trust To Revenue. Retrieved from
    https://blog.civil.co/2019/11/14/boosts-from-trust-to-
    revenue/?utm_source=weekly&utm_medium=newsletter&utm_campaign=Boo
    stsID_1115

Iles, M. (2019b). The Trusted Web. Retrieved from https://blog.joincivil.com/the-
    trusted-web-fa410edd7bb3

Iles, M. (2019c). The Value of Journalism. Retrieved from
    https://blog.joincivil.com/the-value-of-journalism-1c0e6905f780

Ingram, M. (2018). A Civil primer: The benefits, and pitfalls, of a new media
    ecosystem. *Columbia Journalism Review*. Retrieved from
    https://www.cjr.org/business_of_news/civil.php

Ito, K., & O'Dair, M. (2019). A Critical Examination of the Application of
    Blockchain Technology to Intellectual Property Management. In H. Treiblmaier
    & R. Beck (Eds.), *Business Transformation through Blockchain* (pp. 317-335).
    Cham, Switzerland: Springer International Publishing.

Joint Canadian Securities Administrators/Investment Industry Regulatory
    Organization of Canada. (2019). *Consultation Paper 21-402: Proposed
    Framework for Crypto-Asset Trading Platforms*. Retrieved from
    https://www.osc.gov.on.ca/en/SecuritiesLaw_csa_20190314_21-402_crypto-
    asset-trading-platforms.htm

Kauflin, J., & Hansen, S. (2018). Cryptopia In Crisis: Joe Lubin's Ethereum
    Experiment Is A Mess. How Long Will He Prop It Up? *Forbes*. Retrieved from
    https://www.forbes.com/sites/jeffkauflin/2018/12/05/cryptopia-in-crisis-
    billionaire-joe-lubins-ethereum-experiment-is-a-mess-how-long-will-he-prop-
    it-up/#4843330a2f0a

Kesterton, W. H. (1967). *A History of Journalism in Canada*. Toronto: McClelland
    and Stewart.

Kim, B., & Yoon, Y. (2019). Journalism Model Based on Blockchain with Sharing Space. *Symmetry, 11*(1), 19. doi:10.3390/sym11010019

King, A. A., & Baatartogtokh, B. (2015). How Useful Is the Theory of Disruptive Innovation? *MIT Sloan Management Review, 57*(1), 77-90. Retrieved from https://sloanreview.mit.edu/article/how-useful-is-the-theory-of-disruptive-innovation/

Kinsley, D. (2018). The Roadmap to Permanence. Retrieved from https://blog.joincivil.com/the-roadmap-to-permanence-f321b5934a0e

Kinsley, D. (2019a). The Advanced Member's Guide to Buying Civil Tokens. Retrieved from https://blog.joincivil.com/the-advanced-members-guide-to-buying-civil-tokens-5e0ccdc918cc

Kinsley, D. (2019b). Kirby and the birth of wall-apps. Retrieved from https://blog.joincivil.com/kirby-and-the-birth-of-wall-apps-bd6ce396e229

Koren, S. (2019). Introducing the News Provenance Project. Retrieved from https://open.nytimes.com/introducing-the-news-provenance-project-723dbaf07c44

La Presse Canadienne. (2017). TC Transcontinental ferme une usine construite en 2003 à Montréal. *Le Devoir*. Retrieved from https://www.ledevoir.com/economie/512345/tc-ferme-une-imprimerie

Langley, A. (1999). Strategies for Theorizing from Process Data. *The Academy of Management Review, 24*(4), 691-710. doi:10.2307/259349

Langlois, S., Sauvageau, F., & Proulx, S. (2019). Les journalistes, des alliés du peuple. *Le Devoir*. Retrieved from https://www.ledevoir.com/opinion/idees/566960/medias-les-allies-du-peuple

Leblanc, D. (2018). Media sector gets $595-million package in Ottawa's fiscal update. *The Globe and Mail*. Retrieved from https://www.theglobeandmail.com/politics/article-media-sector-gets-595-million-package-in-ottawas-fiscal-update/

Lepore, J. (2014). The Disruption Machine. *The New Yorker, 90*(17). Retrieved from https://search-proquest-com.proxy.bibliotheques.uqam.ca/docview/1541540958?rfr_id=info%3Axri%2Fsid%3Aprimo

Levy, D. A. L., & Nielsen, R. K. (2010). *The Changing Business of Journalism and its Implications for Democracy*. Retrieved from https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2017-11/The%20Changing%20Business%20of%20Journalism%20and%20its%20Implications%20for%20Democracy.pdf

Libby, M. (2018). Civil Weekly Newsletter: 11/16 Edition. Retrieved from https://blog.joincivil.com/civil-weekly-newsletter-11-16-edition-21eee7c20b50

Libby, M. (2019). Civil Weekly Newsletter: 12/21 Edition. Retrieved from https://blog.joincivil.com/civil-weekly-newsletter-12-21-edition-468ecd773cec

Lyons, T. (2018). *Blockchain Innovation in Europe*. Retrieved from https://www.eublockchainforum.eu/sites/default/files/reports/20180727_report_innovation_in_europe_light.pdf

Lyons, T., Courcelas, L., & Timsit, K. (2018). *Blockchain and the GDPR*. Retrieved from https://www.eublockchainforum.eu/sites/default/files/reports/20181016_report_gdpr.pdf

Lyons, T., Courcelas, L., & Timsit, K. (2019a). *Blockchain and Digital Identity*. Retrieved from https://www.eublockchainforum.eu/sites/default/files/report_identity_v0.9.4.pdf

Lyons, T., Courcelas, L., & Timsit, K. (2019b). *Scalability, Interoperability and Sustainability of Blockchains*. Retrieved from https://www.eublockchainforum.eu/sites/default/files/reports/report_scalaibility_06_03_2019.pdf

Macnamara, J. (2010). Remodelling Media: The Urgent Search for New Media Business Models. *Media International Australia, 137*(1), 20–35. doi:10.1177/1329878X1013700104

Macnamara, J. (2014). *The 21st Century Media (R)evolution: Emergent Communication Practices* (2nd ed.). New York: Peter Lang.

Mahn, J. (2019). Reine Vertrauensfrage: Blockchain-Technik jenseits von Kryptogeld. *c't 23,* 74-85. Retrieved from https://www.heise.de/select/ct/2019/23/1572964914251208

Mari, W. (2019). *A Short History of Disruptive Journalism Technologies: 1960 - 1990*. Abingdon & New York: Routledge Focus.

Markides, C. (2006). Disruptive Innovation: In Need of Better Theory. *Journal of Product Innovation Management, 23*, 19-25.

Marr, B. (2017). A Short History Of Bitcoin And Crypto Currency Everyone Should Read. *Forbes*. Retrieved from https://www.forbes.com/sites/bernardmarr/2017/12/06/a-short-history-of-bitcoin-and-crypto-currency-everyone-should-read/#75c133d13f27

Matsakis, L. (2018). Praying To Satoshi at the Blockchain Art Expo. *Wired*. Retrieved from https://www.wired.com/story/ethereal-summit-blockchain-art/

McLuhan, M. (1964). *Understanding Media: The Extensions of Man* (5th ed.). New York: McGraw-Hill Book Company.

Meuser, M., & Nagel, U. (2009). The Expert Interview and Changes in Knowledge Production. In A. Bogner, B. Littig, & W. Menz (Eds.), *Interviewing Experts* (pp. 17–42). Basingstoke: Palgrave Macmillan.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook* (2nd ed.). Thousand Oaks, California: SAGE Publications.

Moore, D. (2018). Sludge Publishes Full Text of Investigation to Ethereum Blockchain. *Sludge*. Retrieved from https://readsludge.com/2018/12/19/sludge-publishes-full-text-of-investigation-to-ethereum-blockchain/

Moses, L. (2018). The Associated Press signs on with journalism blockchain startup Civil. *Digiday*. Retrieved from https://digiday.com/media/associated-press-signs-journalism-blockchain-startup-civil/

Mulligan, C., Zhu Scott, J., Warren, S., & Rangaswami, J. P. (2018). *Blockchain Beyond the Hype: A Practical Framework for Business Leaders*. Retrieved from http://www3.weforum.org/docs/48423_Whether_Blockchain_WP.pdf

Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*. Retrieved from https://bitcoin.org/bitcoin.pdf

Neuberger, C. (2014). User Participation and Professional Journalism on the Internet: Theoretical Background and Empirical Evidence. In M. Schreiber & C. Zimmermann (Eds.), *Journalism and Technological Change: Historical Perspectives, Contemporary Trends* (pp. 244-263). Frankfurt am Main: Campus Verlag.

Newman, N., Fletcher, R., Kalogeropoulos, A., Levy, D. A. L., & Nielsen, R. K. (2018). *Reuters Institute Digital News Report 2018*. Retrieved from https://reutersinstitute.politics.ox.ac.uk/sites/default/files/digital-news-report-2018.pdf

Newman, N., Fletcher, R., Kalogeropoulos, A., & Nielsen, R. K. (2019). *Reuters Institute Digital News Report 2019*. Retrieved from https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2019-06/DNR_2019_FINAL_0.pdf

News Media Canada. (2020). Net Advertising Volume: Canada - Millions of Dollars (CDN Currency). Retrieved from https://nmc-mic.ca/wp-content/uploads/2020/01/2018-Net-Advertising-Volumes-Report_NAV.pdf

Ng, P. (2018). Introducing the Civil Events Crawler. Retrieved from https://blog.joincivil.com/introducing-the-civil-events-crawler-29fe05d3f861

Ng, P. (2019). Civil ID Hubs, DIDs & Verifiable Credentials. Retrieved from https://blog.joincivil.com/on-dids-verifiable-claims-the-civil-id-hub-1f5ab7a392dd

Nielsen, G. M. (2016). Critical Theory and Acts of Journalism: Expanding the Implied Audience. In M. Gasher, C. Brin, C. Crowther, G. King, E. Salamon, & S. Thibault (Eds.), *Journalism in Crisis - Bridging Theory and Practice for Democratic Media Strategies in Canada* (pp. 53-76). Toronto: University of Toronto Press.

Noël, A. (2011). *La conduite d'une recherche: Mémoires d'un directeur*. Montréal: Les Éditions JFD.

O'Dair, M. (2019). *Distributed creativity: How blockchain technology will transform the creative economy*. Cham, Switzerland: Palgrave Macmillan.

OECD. (2010). *News in the Internet Age: New Trends in News Publishing*. Retrieved from http://dx.doi.org/10.1787/9789264088702-en

OECD. (2018). *Blockchain Technology and Corporate Governance: Technology, Markets, Regulation and Corporate Governance*. Retrieved from https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/CA/CG/RD(2018)1/REV1&docLanguage=En

Okrzesik, R. (2018). Publishing on Civil: A Journalist-Friendly Explanation of How it Works. Retrieved from https://blog.joincivil.com/publishing-on-civil-a-journalist-friendly-explanation-of-how-it-works-295f0686625

Orlikowski, W. J. (2000). Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. *Organization Science, 11*(4), 404–428. doi:10.1287/orsc.11.4.404.14600

Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. Hoboken, New Jersey: Wiley.

Ostrom, E. (2010). Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *American Economic Review, 100*(3), 1-33.

Ostrom, E. (2015). *Governing the commons: The evolution of institutions for collective action*. Cambridge: Cambridge University Press.

Owen, L. H. (2018a). Civil promises that you don't have to care about blockchain to care about what it's doing (also, its first newsrooms just launched). *NiemanLab*. Retrieved from https://www.niemanlab.org/2018/06/civil-promises-that-you-dont-have-to-care-about-blockchain-to-care-about-what-its-doing-also-its-first-newsrooms-just-launched/

Owen, L. H. (2018b). Civil's token sale has failed. Now what? Refunds, for one thing — and then another sale. *NiemanLab*. Retrieved from https://www.niemanlab.org/2018/10/civils-token-sale-has-failed-now-what-refunds-for-one-thing/

Oxford University Press. (2019a). optical character recognition (OCR). Retrieved from https://www-oxfordreference-com.proxy.bibliotheques.uqam.ca/view/10.1093/acref/9780199576128.001.0001/acref-9780199576128-e-1081

Oxford University Press. (2019b). potential. Retrieved from https://premium-oxforddictionaries-com.proxy.bibliotheques.uqam.ca/us/definition/american_english/potential

Oxford University Press. (2019c). typewriter. Retrieved from https://www-oxfordreference-com.proxy.bibliotheques.uqam.ca/view/10.1093/acref/9780199576128.001.0001/acref-9780199576128-e-1081

Papineau, P. (2019). La Presse canadienne dans la tourmente de la crise des médias. *Le Devoir*. Retrieved from https://www.ledevoir.com/culture/medias/549265/medias-la-presse-canadienne-entre-l-arbre-et-l-ecorce

Park, G., Shin, S. R., & Choy, M. (2020). Early mover (dis)advantages and knowledge spillover effects on blockchain startups' funding and innovation performance. *Journal of Business Research, 109*, 64-75. doi:https://doi.org/10.1016/j.jbusres.2019.11.068

Patton, M. Q. (2009). *Qualitative Research & Evaluation Methods* (Third ed.). Thousand Oaks, California: Sage Publications.

Pavlik, J. V. (2013). Innovation and the Future of Journalism. *Digital Journalism, 1*(2), 181-193. doi:10.1080/21670811.2012.756666

Pfadenhauer, M. (2009). At Eye Level: The Expert Interview – a Talk between Expert and Quasi-expert. In A. Bogner, B. Littig, & W. Menz (Eds.), *Interviewing Experts* (pp. 81–97). Basingstoke: Palgrave Macmillan.

Philp, R. (2018). Can Civil's Blockchain Save Journalism? *Global Investigative Journalism Network*. Retrieved from https://gijn.org/2018/05/14/can-civils-blockchain-technology-save-journalism/

Ragnedda, M., & Destefanis, G. (Eds.). (2020). *Blockchain and Web 3.0 - Social, Economic, and Technological Challenges*. London and New York: Routledge.

Ricci, S. (2019). La Chine s'apprête à lancer sa propre monnaie virtuelle. *Le Devoir*. Retrieved from https://www.ledevoir.com/economie/564863/commerce-la-chine-s-apprete-a-lancer-sa-propre-monnaie-virtuelle

Salamon, E., King, G., Crowther, C., & Thibault, S. (2016). Conclusion: Strategies Forward - A Future for Journalism. In M. Gasher, C. Brin, C. Crowther, G. King, E. Salamon, & S. Thibault (Eds.), *Journalism in Crisis - Bridging Theory and Practice for Democratic Media Strategies in Canada* (pp. 266-278). Toronto: University of Toronto Press.

Saldaña, J. (2009). *The Coding Manual for Qualitative Researchers*. London: SAGE Publications.

Sallaba, M., Gramatke, M. R., & Mogg, A. (2017). Blockchain @ Media: A new Game Changer for the Media Industry? Retrieved from https://www2.deloitte.com/content/dam/Deloitte/tr/Documents/technology-media-telecommunications/deloitte-PoV-blockchain-media.pdf

Savelyev, A. (2018). Copyright in the blockchain era: Promises and challenges. *Computer Law & Security Review, 34*(3), 550–561. doi:10.1016/j.clsr.2017.11.008

Schiller, V. (2018a). The Civil Foundation — A New Fund to Support Ethical Journalism Around the World. Retrieved from https://blog.joincivil.com/the-civil-foundation-a-new-fund-to-support-ethical-journalism-around-the-world-ea5995a0e883

Schiller, V. (2018b). Introducing the First Civil Council Members, and Looking Ahead to the Next Year. Retrieved from https://blog.joincivil.com/introducing-the-first-civil-council-members-and-looking-ahead-to-the-next-year-def988ae25a1

Schiller, V. (2018c). Why I'm Joining Civil. Retrieved from
https://blog.joincivil.com/why-im-joining-civil-ca474d8b7440

Schiller, V. (2019a). Civil Council's Statement on the Blockchain Trailblazer's
Appeal. Retrieved from https://blog.joincivil.com/civil-councils-statement-on-
the-blockchain-trailblazer-s-appeal-af053d04b9b9

Schiller, V. (2019b). Civil: From Trust to Identity. Retrieved from
https://blog.civil.co/2019/11/14/civil-from-trust-to-
identity/?utm_source=weekly&utm_medium=newsletter&utm_campaign=Boos
tsID_1115

Schlatt, V., Schweizer, A., Urbach, N., & Fridgen, G. (2016). *Blockchain:
Grundlagen, Anwendungen und Potenziale*. Retrieved from
https://www.fit.fraunhofer.de/content/dam/fit/de/documents/Blockchain_White
Paper_Grundlagen-Anwendungen-Potentiale.pdf

Scobel. (2019). Medien, Macht und Manipulation [Television Broadcast]. *scobel*.
Retrieved from https://www.3sat.de/wissen/scobel/190523-medien-macht-
manipulation-100.html

Seebacher, S., & Schüritz, R. (2017). Blockchain Technology as an Enabler of
Service Systems: A Structured Literature Review. In S. Za, M. Drăgoicea, &
M. Cavallari (Eds.), *Exploring Services Science* (pp. 12–23). Cham,
Switzerland: Springer International Publishing.

Shteinbuk, I. (2018). Interacting with Ethereum Smart Contract Events in Go with the
Civil Events Crawler. Retrieved from https://blog.joincivil.com/interacting-
with-ethereum-smart-contract-events-in-go-with-the-civil-events-crawler-
7db484a78d5f

Skinner, D., Cross, K., & Hackett, R. A. (2016). Media Policy Reform as a
Foundation for Better Journalism. In M. Gasher, C. Brin, C. Crowther, G. King,
E. Salamon, & S. Thibault (Eds.), *Journalism in Crisis - Bridging Theory and
Practice for Democratic Media Strategies in Canada* (pp. 77-100). Toronto:
University of Toronto Press.

Skok, D. (2012). Finding a Way Forward. *Nieman Reports, 66*(3), 4-5. Retrieved
from https://niemanreports.org/articles/breaking-news/

Smith, A. (2020). Interview with Elinor Ostrom and Oliver E. Williamson, Prize in Economic Sciences 2009 [Video]. Retrieved from https://www.youtube.com/watch?v=3w8WrJW_Y44

Startup Genome. (2019). *Global Startup Ecosystem Report 2019*. Retrieved from https://startupgenome.com/gser2019

Stursberg, R. (2016). *Cultural Policy for the Digital Age*. Retrieved from https://techlaw.uottawa.ca/sites/techlaw.uottawa.ca/files/culturalpolicyforthedigitalage.pdf

Tapscott, D., & Tapscott, A. (2018). *Die Blockchain Revolution: Wie die Technologie hinter Bitcoin nicht nur das Finanzsystem, sonder die ganze Welt verändert* (Fifth ed.). Kulmbach: Plassen Verlag.

The Economist. (2018). Why bitcoin uses so much energy. Retrieved from https://www.economist.com/the-economist-explains/2018/07/09/why-bitcoin-uses-so-much-energy

Vázquez Sampere, J. P., Bienenstock, M. J., & Zuckerman, E. W. (2016). Debating Disruptive Innovation. *MIT Sloan Management Review, 57*(3). Retrieved from https://sloanreview.mit.edu/article/debating-disruptive-innovation/

Vitali-Rosati, M. (2019). Le « numérique », une notion qui ne veut rien dire. *The Conversation*. Retrieved from https://theconversation.com/le-numerique-une-notion-qui-ne-veut-rien-dire-116333

Volokh, E. (1995). Cheap Speech and What It Will Do. *The Yale Law Journal, 104*(7), 1805-1852. Retrieved from https://digitalcommons.law.yale.edu/ylj/vol104/iss7/10/

Vuong, N. (2018). The Civil Registry: a TCR for Quality Journalism. Retrieved from https://blog.joincivil.com/the-civil-registry-a-tcr-for-quality-journalism-a2452f363665

Wahl-Jorgensen, K. (2014). Changing Technologies, Changing Journalistic Epistemologies: Public Participation, Emotionality and the Challenge to Objectivity. In M. Schreiber & C. Zimmermann (Eds.), *Journalism and Technological Change: Historical Perspectives, Contemporary Trends* (pp. 264-283). Frankfurt am Main: Campus Verlag.

Walker, M. (2017). Top Trends in the Gartner Hype Cycle for Emerging Technologies, 2017. *Gartner*. Retrieved from https://www.gartner.com/smarterwithgartner/top-trends-in-the-gartner-hype-cycle-for-emerging-technologies-2017/

Walker, M., Burton, B., & Cantara, M. (2016). Hype Cycle for Emerging Technologies, 2016. *Gartner*. Retrieved from https://www.gartner.com/en/newsroom/press-releases/2016-08-16-gartners-2016-hype-cycle-for-emerging-technologies-identifies-three-key-trends-that-organizations-must-track-to-gain-competitive-advantage

Wallace, B. (2011). The rise and fall of bitcoin. *Wired*. Retrieved from https://www.wired.com/2011/11/mf-bitcoin/

Wang, H., Chen, K., & Xu, D. (2016). A maturity model for blockchain adoption. *Financial Innovation, 2*(1), 1-5. doi:10.1186/s40854-016-0031-z

Webb, A. (2018). 11th Annual Tech Trends For Journalists [Lecture]. Retrieved from https://ona18.journalists.org/sessions/11th-tech-trends-amy-webb/

Whittaker, J. (2019). *Tech Giants, Artificial Intelligence, And The Future Of Journalism*. New York and London: Routledge.

Wilke, J. (2014). From Handmade to Technology-Driven Journalism: Changes and Developments in Research, Writing, Editing, and Makeup. In M. Schreiber & C. Zimmermann (Eds.), *Journalism and Technological Change: Historical Perspectives, Contemporary Trends* (pp. 80-110). Frankfurt am Main: Campus Verlag.

Winseck, D. (2010). Financialization and the "Crisis of the Media": The Rise and Fall of (Some) Media Conglomerates in Canada. *Canadian Journal of Communication, 35*(3), 365-393. Retrieved from https://www.cjc-online.ca/index.php/journal/article/view/2392

Woods, T. (2018). How a Plan to Save Journalism Stumbled Out of the Gate. *The Bridge*. Retrieved from https://thebridgebk.com/how-plan-to-save-journalism-stumbled/

World Economic Forum. (2017). *The Global Risks Report 2017 12th Edition*. Retrieved from http://www3.weforum.org/docs/GRR17_Report_web.pdf

World Economic Forum. (2019). *The Global Risks Report 2019 14th Edition*. Retrieved from http://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf

Yin, R. K. (2003). *Case Study Research: Design and Methods* (3rd ed.). Thousand Oaks, California: Sage Publications.

Yli-Huumo, J., Ko, D., Choi, S., Park, S., & Smolander, K. (2016). Where Is Current Research on Blockchain Technology? - A Systematic Review. *PloS one, 11*(10), 1-27. doi:10.1371/journal.pone.0163477

Zammuto, R. F., Griffith, T. L., Majchrzak, A., Dougherty, D. J., & Faraj, S. (2007). Information Technology and the Changing Fabric of Organization. *Organization Science, 18*(5), 749–762. doi:10.1287/orsc.1070.0307

Zhao, J. L., Fan, S., & Yan, J. (2016). Overview of business innovations and research opportunities in blockchain and introduction to the special issue. *Financial Innovation, 2*(1), 1-7. doi:10.1186/s40854-016-0049-2

Zhao, W. (2018). Media Startup Civil to Issue Refunds as $8 Million Token Sale Fails. *Coindesk*. Retrieved from https://www.coindesk.com/media-startup-civil-to-issue-refunds-as-8-million-token-sale-fails

Zimmermann, C., & Schreiber, M. (2014). Introduction: Towards a New Perspective on Journalism and Technology. In M. Schreiber & C. Zimmermann (Eds.), *Journalism and Technological Change: Historical Perspectives, Contemporary Trends* (pp. 9-29). Frankfurt am Main: Campus Verlag.

Zomorodi, M., & Poyant, J. (2018a). Chapter 6: What's a CVL Token? [Podcast]. *ZigZag*. Retrieved from https://zigzagpod.com/2018/07/12/chapter-6-whats-a-cvl-token/

Zomorodi, M., & Poyant, J. (2018b). Chapter 7: A New Frontier for Journalism? [Podcast]. *ZigZag*. Retrieved from https://zigzagpod.com/2018/07/19/chapter-7-a-new-frontier-for-journalism/

Zomorodi, M., & Poyant, J. (2018c). Chapter 12: Enter the Mesh [Podcast]. *ZigZag*. Retrieved from https://zigzagpod.com/2018/08/23/chapter-12-enter-the-mesh/

Zomorodi, M., & Poyant, J. (2018d). S2 EP2: Why Civil's Token Sale Failed [Podcast]. *ZigZag*. Retrieved from https://zigzagpod.com/2018/10/18/s2-ep2-why-civils-token-sale-failed/

Zomorodi, M., & Poyant, J. (2018e). An Update: It's Hard Going Back to School, Work, and Saving Journalism [Podcast]. *ZigZag*. Retrieved from https://zigzagpod.com/2018/09/06/an-update-its-hard-going-back-to-school-work-and-saving-journalism/