"Instead of Hype, Would You Like to Hear Real Examples?": Exploring Blockchain Talk on Twitter

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Abstract This article investigates Twitter as an arena of organizations' impression management. We look into the ways organizations use this social media platform for establishing an image of competence and expertise around a new technological innovation. This study is based on a discourse analysis of 3,033 Finnish language tweets, sent between 2015–2018. These tweets were selected on the basis of containing the hashtag #blockchain, which allowed us to explore how organizations and their representatives engaged in "blockchain talk" in the Finnish Twittersphere. Our findings indicate that while this blockchain talk most commonly manifested through news and information dissemination, it was also used to construct expertise and to highlight organizational values. Even organizations that had nothing to do with actual blockchain applications seemed to want to participate in the blockchain talk. In addition to presenting new insights into the online discourse on technological innovation, this study contributes to research on Twitter as a forum for organizational communication.

Keywords blockchain, expertise, impression management, organizational communication, technological innovation, Twitter

1 Introduction

Social media has become an important arena for organizations' impression management (Benthaus/Risius/Beck 2016, Sun/Fang/Zhang 2021). By participating in discussions on trending topics, organizations can construct their image in relation to or through these topics. For example, organizations can use discussions to highlight their values or forms of expertise, even if they are only indirectly associated with the topic. In this article, we examine how different organizational representatives participate in such impression management by contributing to a discussion on a new technological innovation – namely, blockchain technology. Blockchain and its various real and potential applications constitute a popular topic in contemporary media, particularly in the context of cryptocurrencies and NFTs[1] (Serada 2023) and new business opportunities (Rosati/Čuk 2019). Many organizations are eager to find opportunities to adapt blockchain technology to their businesses and areas of operation, and many are also eager to *appear* adapting it – a fact that is reflected in the ways these organizations communicate on social media (e. g. Beck et al. 2019). As Egliston/Carter (2023) argue, in the context of blockchain, discourses are particularly important, as the technology still exists predominantly within a discursive register and its value is largely speculative in nature (also e. g. Serada 2023). In many of these discourses, blockchain technology is perceived as "revolutionary" (Meunier 2018) and the "technology of the future" (Demirkan/Demirkan/McKee 2020), which makes

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it attractive to organizations that wish to appear up-to-date and visionary with technological innovation. However, as the discourses on blockchain, especially in the context of cryptocurrencies, are also characterized by instability, unpredictability (e. g. Lynn/Rosati/Fox 2018), and environmental concerns (e. g. Polemis/Tsionas 2021), contributing to blockchain discourse as part of organizational impression management is not short of risk or potential problems.

In this study, we view organizational tweets referring to blockchain technology as acts of impression management (Goffman 1959). Impression management can be considered as "efforts made by individuals to control information in order to influence the impressions formed about them in the minds of others" (Richey/Ravishankar/Coupland 2016: 598). Goffman's original formulation stressed "face-work" in controlling information in social interaction, but in this article impression management refers to the communicative processes by which desired identities are secured from an organizational perspective. Organizational impression management consists of a multitude of practices (Gaim/Clegg/Pina e Cunha 2021), but here, we focus on the empirical analysis of tweets posted by organizational representatives. Following Goffman (1959), these organizational representatives are considered members in a "team of performers", whose social media posts contribute to impressions of the broader organization they represent (Richey/Ravishankar/Coupland 2016: 598).

In this article, our goal is to explore the ways different organizations and their representatives engage in what we call *blockchain talk* on Twitter in order to identify the main actors of the early "blockchain community" in Finland, and to establish how these actors discursively position themselves and construct particular impressions in relation to blockchain technology and its applications. By *community*, we refer to the audience discussing a certain topic on Twitter, brought together ad hoc by a hashtag (Bruns/Burgess 2011). Organizational communication refers to the ways in which the members of an organization use messages and social interaction to create, sustain, and manage meanings at all levels within and across organizational functions and structures (e. g. Mazzei 2014). This includes establishing and maintaining a favorable image among organizations' stakeholders (Christensen/Cornelissen 2013: 387). While there is previous research on the role of social media for organizations' impression management (e. g. Benthaus/Risius/Beck 2016, Fieseler/Ranzini 2015, Richey/Ravishankar/Coupland 2016, Sun/Fang/Zhang 2021), less attention has been paid to the ways in which organizational representatives, or performers, use social media indirectly for establishing an image of competence and expertise specifically in the context of technological innovation.

Through our analysis of organizational tweeting on blockchain technology, we aim to shed light on how an image of competence and expertise is constructed in the Finnish Twittersphere by asking the following research questions: 1) Which types of organizations take part in blockchain talk? 2) What types of tweets does the blockchain talk consist of? And finally, 3) how do the tweets function as part of organizational impression management?

To answer these questions, we conducted a quantitative and qualitative analysis of 3,033 tweets, sent between 2015–2018 by Twitter users who represent different organizations and tweet about blockchain in the Finnish context (identified through the use of the Finnish language). Discourse analysis was used to distinguish between different types of tweets and to establish the range of topics discussed – that is, we focused on the ways the organizations used written language to construct particular ideas of blockchain and to position themselves in relation to these ideas (e. g. Herring 2004). Our data represents a variety of collective actors, ranging from commercial enterprises and public sector agencies to non-governmental and non-profit organizations (NGOs). The selected observation period can be considered the "first

stage" of blockchain talk in the Finnish Twittersphere; our earlier study showed that the first usage of the Finnish term for blockchain ("lohkoketju") on Twitter took place on July 6, 2015 (Sihvonen/Koskela/Huusko 2020: 21 f.).

Although organizations' tweets have been studied before (e. g. Etter 2014, Lovejoy/Saxton 2012, Park/Reber/Chon 2016, Su et al. 2017), previous studies have largely focused on examining tweets within specific industries (e. g. science organizations, health organizations, non-profits). Our focus, in contrast, is determined by a shared topic (i. e. blockchain as a technological innovation) that is discussed on Twitter by an exceptionally wide range of actors and industries. The relevance of Twitter as a platform for organizational communication on blockchain technology has previously been addressed by Lynn/Rosati/Fox (2018), who have presented work on organizations using Twitter as a tool to legitimize blockchain. However, their focus is on applying a legitimacy taxonomy to the study of tweets, whereas we focus on how organizational impression management works on Twitter. We begin by explaining the relevance of blockchain as a "trending" topic, particularly in the context of Twitter, and then move on to analyzing the different types of tweets that address this topic from the perspective of organizational impression management.

2 Theoretical background

2.1 Blockchain technology and its applications in social media discussions

Blockchain technology rose to the public eye along with the introduction of the first cryptocurrency, bitcoin, in the White Paper published by the pseudonym Satoshi Nakamoto (2008). The idea of a decentralized, anonymous digital currency originated from the cryptoanarchist and cypherpunk movement that sought new technological means for "horizontal" governance and economy (Hütten 2019). Despite the anti-corporate and anti-central banking agenda of the developers and early adopters of blockchain, its financial, commercial, and technological potential initiated its institutional and organizational adoption in the early 2010s (Iansiti/Lakhani 2017, Rosati/Čuk 2019). At the most basic level, a blockchain can be described as a digital ledger: it is a distributed database that consists of chronologically arranged records compiled in blocks, linked and secured by cryptographic hashes. There is no central server; ideally, the archive of all transactions is reproduced in every node of the main network and constantly updated upon consensus between the nodes entitled to validation rights (Tredinnick 2019). Blockchain's most common use case is professional cryptocurrency trading, although many other uses, including industrial applications such as supply chains (e. g. Helo/Hao, 2019) and smart grids for the electricity market (Diestelmeier 2019), have been suggested.

Cryptocurrencies and blockchain technologies have been actively discussed on social media since their introduction, which has contributed to public awareness about them and shaped their adopter communities. Early on in blockchain studies, Garcia et al. (2014) described feedback loops between public communication on bitcoin, the number of new bitcoin wallets, and increase in its price. Since then, numerous studies have pursued similar goals of discovering interdependencies between social and legacy media appearances of cryptocurrencies and their prices (e. g., Laskowski/Kim 2016, Steinert/Herff 2018, Valencia/Gómez-Espinosa/Valdés-Aguirre 2019). As we have demonstrated elsewhere (Serada 2023), previous empirical studies on Twitter and blockchain have focused on the price changes of cryptocurrencies and the financial gains for individual traders that potentially follow them, not on organizational

communication or the blockchain discourse itself. Nevertheless, Twitter is clearly relevant for blockchain adopters (Ante 2023), and its significance in organizational communication is increasing (e. g. Wang/Yang 2020). We need new research to understand its potential for introducing "hot", trending technological topics through which organizational actors are able to brand themselves as trailblazers.

2.2 Organizational communication on Twitter

Twitter facilitates various types of communication, from reporting daily activities to forwarding information and sharing links to outside resources (Page 2011: 93). While it is categorized as a social networking site, Twitter's interactional dynamics differ from platforms designed for peer-to-peer communication, such as Facebook (Page 2011: 94). Twitter does not "impose mutual connections on users" (Okay/Ašanin Gole/Okay 2021: 177), which leads to asymmetric networks. Indeed, although Twitter also enables personal communication (e. g. direct messages), it is commonly used for one-to-many communication by organizations and public figures (e. g. Etter 2014, Okay/Ašanin Gole/Okay 2021). In Finland, Twitter is popular with politicians, (political) journalists, and researchers who are even regarded as an elite network (Ruoho/Kuusipalo 2019). Twitter also allows organizations to promote themselves and to disseminate information about their activities,[2] while also maintaining dialogue with stakeholders (e. g. Wang/Yang 2020). However, organizations' Twitter use often emphasizes informing over interaction (Lim/Lee-Won 2017: 422 f.).

Previous research has explored organizational communication on Twitter in different contexts. Lovejoy/Saxton (2012), who studied Twitter use by non-profit organizations, established a three-part categorization for the functions of tweets in delivering a message: *information*, *community*, and *action*. Similarly, Su et al. (2017) studied how scientific institutions used Twitter, focusing on the content of tweets, hyperlinks, hashtags, mentions, and retweets. They also established three main functions for tweets: *information*, *participation*, and *community* (Su et al. 2017: 580). Of these, information was the most popular category with 74 % of the tweets (Su et al. 2017: 583). They also found out that while the use of hyperlinks was common among science organizations' tweets, other interactive features such as mentioning and retweeting were less prevalent (Su et al. 2017: 584). In their study on the Twitter communication of US-based health organizations, Park/Reber/Chon (2016) also focused on the topics, functions, and interactive features of tweets. They found that health organizations' tweets focused more on organization-related topics as opposed to personal health topics, that original tweets were more prevalent than retweets, and that the use of hyperlinks was common (Park/Reber/Chon 2016: 194). They identified benefits of Twitter use for organizations, including community-building, displaying credibility, and "pushing out" original content (Park/Reber/Chon 2016: 197). In their experimental study on retweeting in organizational Twitter communication, Lim/Lee-Won (2017) found that dialogic retweets (i. e. an organization's retweets of other tweets that mention the organization) had a more positive effect on organizations' social presence than monologic tweets (i. e. one-way tweets that do not feature interaction) on the same topics. Their results highlight the importance of interactive Twitter communication,

[2] However, it is worth noting that Twitter, along with other social media platforms, also has its problematic sides for organizations. For a critical discussion on digitalization and its effects on organizations, cf. e. g. Trittin-Ulbrich/Scherer 2021.

suggesting that organizations should use Twitter's technological affordances more in order to keep their audiences engaged (Lim/Lee-Won 2017: 431).

Based on previous research, we argue that Twitter use has its benefits in terms of impression management, as tweets can be used strategically to project favorable impressions of organizations (Richey/Ravishankar/Coupland 2016: 598). However, organizations do not necessarily utilize Twitter's features to their full potential, as they focus on one-way communication more than interacting with stakeholders. The present study adds to the literature on organizations' Twitter use by examining the types of tweets organizations make use of when participating in discourse around a technological innovation that is not necessarily directly related to their business.

3 Material and methods

The data for this study was collected using the Twitter Application Programming Interface (API) between November 18 and December 24, 2018. The search query was based on the Finnish word for blockchain, *lohkoketju*, as a hashtag, and it yielded results from between September 2015 and November 2018. This raw data contained 5,186 tweets. Originally, the search term was selected as the research group was interested in finding out when the first instances of blockchain terminology began to appear on social media in Finland. By analyzing the appearance of such terms from 2015 onwards, it is possible to detect the "pioneering" organizations taking part in impression management through the discourse concerning this new technology. Furthermore, the presence of a hashtag links this study to an established line of Twitter research, where hashtags are considered as an essential element organizing and structuring online conversations (Bruns/Stieglitz 2014).

The language recognition of the Twitter API was tested to indicate Finnish language tweets, but the results also included a few tweets in English and some hybrid constellations. Retweets, quotes, and replies were included in the data. Using the Finnish search term allowed us to reach a manually codable sample that covered the time period under investigation. Limiting the data collection to the Finnish context enabled us to identify and analyze all the organizational actors participating in the discussion and made it easier to decipher their origins.[3]

To begin our analysis, we read each tweet to form an overall idea of the people and organizations tweeting about blockchain. As our interest was particularly on organizational communication and impression management, the next step was to narrow the data down to tweets from organizations' official accounts as well as by individuals who identified as representatives of organizations. This was done by examining the users' public Twitter profiles.

Individual users were viewed as "organizational representatives" if their profile text was directly linked to an organization, e. g., "CEO of [organization]", or "works in marketing at [organization]". Even though such accounts do not represent the entire organization, they are relevant in terms of impression management, because followers are likely to associate these accounts with the organization (Richey/Ravishankar/Coupland 2016: 607). Accounts were, however, omitted from the data if the user had explicitly stated that the account should be viewed as unrelated to their organization, through statements such as "my tweets do not rep-

[3] Because of the algorithmic factors of Twitter as a platform, the data is not comprehensive, i. e., we do not claim that it includes all the tweets about blockchain in Finnish in this timeframe. However, we consider it a sufficient sample of how the Finnish Twittersphere discussed blockchain.

resent [organization]". Users who had deleted their account or made it private after the original data collection were not included, nor were accounts that had been banned by Twitter. Thus, all individuals whose tweets were included were verified to be affiliated with an organization, and had a public, active Twitter account at the time of the analysis.

After identifying tweets by organizations and their representatives, we were left with a sample of 3,033 tweets. The tweets were then compiled into an Excel file, and manually coded according to a) the industry in which the organization operated (e. g. IT, finance, education), and b) the textual content of the tweet. In order to establish which industries were represented in the data, we again examined the users' profiles. If we were unfamiliar with the organization, and the industry was not evident from their profile information, we looked at the official websites of organizations, typically linked in the profiles. Our categories for different types of tweets were based on a grounded, inductive discourse analysis and informed by earlier research on organizational Twitter communication (Lovejoy/Saxton 2012, Park et al. 2016, Su et al. 2017). We followed Herring's (2004: 339) model for Computer-Mediated Discourse Analysis (CMDA) that builds upon "logs of verbal interaction (characters, words, utterances, messages, exchanges, threads, archives, etc.)" in empirical, computer-mediated data. Herring (2004: 341) names identifying patterns in texts the "basic goal" of discourse analysis. Thus, we conducted a close reading of the tweets and looked for patterns in the ways the organizations communicated about blockchain related topics. Our interpretation of the tweets was guided by the four levels of discursive features established by Herring (2004, 2018): 1) structure, 2) meaning, 3) interaction management, and 4) social phenomena.

On the level of *structure*, we looked for linguistic features such as "us vs. them" language (Herring 2004: 361) in order to distinguish between different types of tweets – for example, to detect whether the blockchain tweets were related to the organization's own activities. We also considered specific ways of using structural features typical of Twitter, such as the use of hashtags to construct meanings, and the placement of links within tweets. On the level of *meaning*, speech acts like congratulating and requesting advice, were observed. *Interaction management* was present in the use of retweets and mentions (Su et al. 2017, Lim/Lee-Won 2017), as well as questions and responses. Finally, on the level of *social phenomena*, we observed how Twitter users displayed their awareness of hierarchies, power dynamics, and other social factors. These were evident in practices of sharing one's employer's content, in acknowledgements of others' expertise, and in language use that highlighted organizational values.

Through the analysis of discursive features of tweets, we identified five main types of blockchain tweets:

1. *Engagement.* These tweets feature direct discussions with other Twitter users, e. g. supporting another user's argument or requesting advice.
2. *Information.* These tweets focus on general information/opinions on blockchain and are typically unrelated to specific organizational activities.
3. *Promotion of others.* These tweets promote other users' activities or products by e. g. congratulating or endorsing them. Unlike engaging tweets, they do not necessarily aim for direct communication with the other party.
4. *Self-promotion.* These tweets advertise the user's own activities, services and/or products.
5. *Resource.* These tweets focus on sharing materials such as reports or documents, blog posts, and podcasts. They are more closely tied to the organization's activities than general information tweets, but are not clearly promotional.

Despite slight overlap, we consider these tweet types as distinct ways of engaging in impression management. Through a detailed qualitative analysis, we were able to identify the particularities that distinguish each category.

Finally, we also illustrate how blockchain talk was distributed across industries, and which types of blockchain tweets were most frequent during our observation period. For this quantitative section, we calculated how many blockchain tweets were posted within each industry, and how many of them were included in each of the tweet types listed above. We also combined these two perspectives by calculating the frequencies of each tweet type within each industry.

In the following discussion of the results, examples from Finnish tweets have been translated into English by the first author. The tweets analyzed are publicly available, and the organizations and their representatives are assumed to be aware of the public nature of their statements. Ethical aspects have been taken into consideration in accordance with the guidelines discussed in Franzke et al. (2020). In the examples, the usernames of official accounts of organizations have been retained, but the names of individuals have been hidden, and pseudonyms ("user_1", "user_2", etc.) used instead.

4 Results

We start by providing an overview of the types of organizations and organizational representatives in the data, and the frequencies of their blockchain tweets, before moving on to the results of the discourse analysis, which show how organizations engaged in blockchain talk and thereby contributed to impression management. Finally, we comment on the relationship between different industries and types of tweets.

4.1 Actors: Organizations and organizational representatives

The organizations and organizational representatives were divided into fifteen categories, which are presented, along with the frequencies of tweet types in each category, in Figure 1 below.

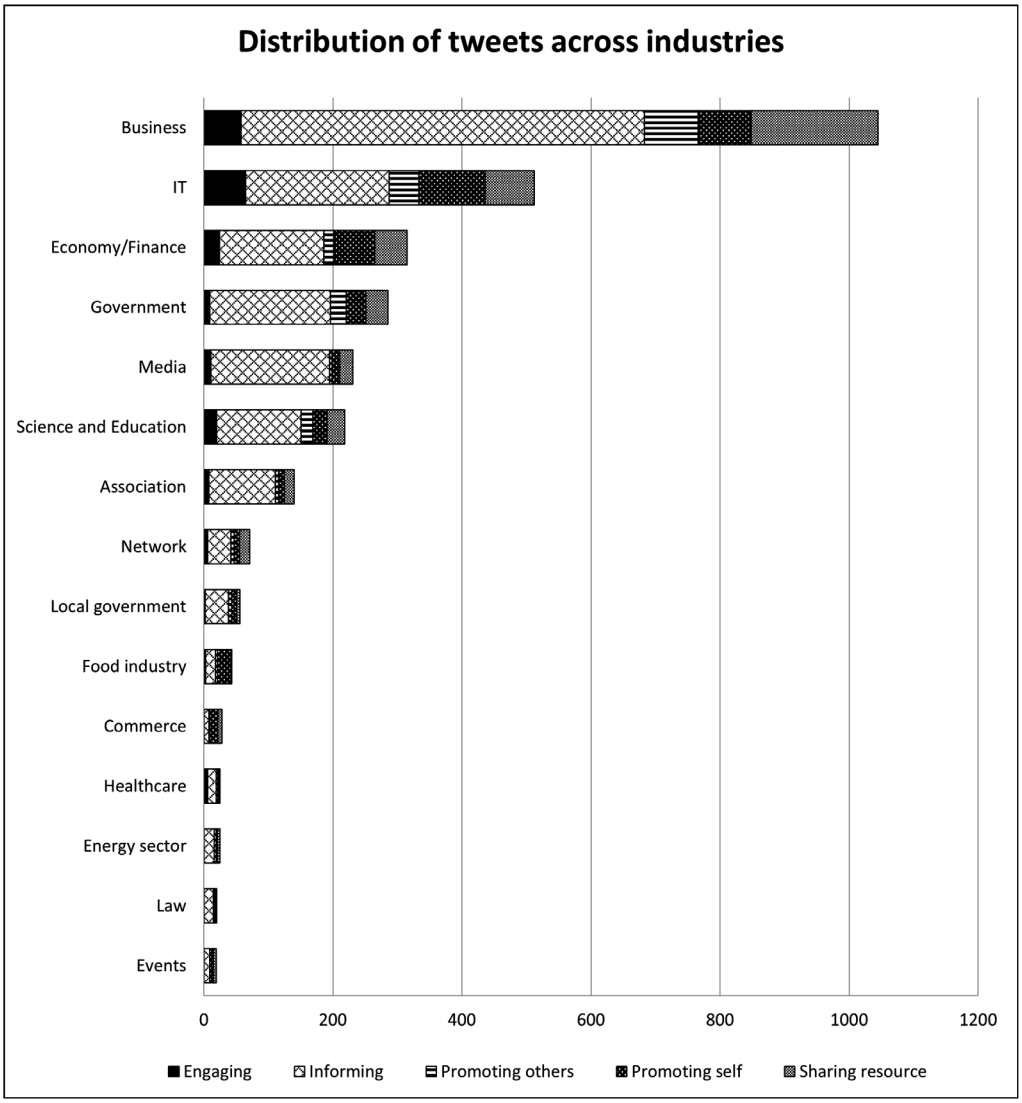

Figure 1: Distribution of tweets across industries. The figure is based on the raw frequencies of tweets.

Organizations in the business category tweeted about blockchain technology the most (1,045 tweets), followed by IT organizations (512 tweets) and the financial sector (315 tweets). This is perhaps unsurprising, considering that business was also the largest and broadest category in the data, and the other two have obvious interests when it comes to blockchain, particularly in the context of cryptocurrencies and the transformation of fintech they are expected to bring along. The business category contained a variety of large and small enterprises, recruitment agencies, and freelancers that could not be categorized in other industries. Notably, it featured many consulting firms, which, according to Lynn/Rosati/Fox (2018) have "a key role in blockchain development and disseminating information to the general public".

However, governmental accounts (286 tweets), the media (231 tweets), and science and education (218 tweets) were not far behind IT and the financial sector in terms of frequency of blockchain tweets. Scientific and educational institutions tweeted about blockchain roughly as often as representatives of the media. Presumably, blockchain technology is of interest to actors in both industries because of its connotations to innovation. Both the "revolutionary" aspects of blockchain and the criticism directed at it, in the context of cryptocurrencies in particular, make it newsworthy and "click-baity" for the media. Since blockchain applications outside the cryptocurrency context are still relatively rare and new, it also makes sense that finding possible new applications and reporting on them would be of interest to researchers and educators. It is noteworthy that governmental actors tweeted about blockchain technology slightly more often than either the media or scientific institutions. Finnish governing officials seem to be interested in blockchain and its applications, and they communicate these interests to the public via social media. Two opposing rationalities might explain this: first, governments are eager to support new technologies if they have potential to boost competitiveness and economic growth, and second, officials are required to protect citizens from the potential hazards associated with new technologies (Mukhtar-Landgren/Paulsson 2021: 136).

4.2 Content: Types of tweets

As illustrated in Figure 2 below, informing tweets (58 %) were the most common type in the data, which is in line with previous studies on organizations' tweets (Lovejoy/Saxton 2012, Park/Reber/Chon 2016, Su et al. 2017). While informing tweets were prevalent in most industries, there were some exceptions, which we will discuss in section 4.3. Next, we provide examples from the data to illustrate the types of tweets that organizational representatives used to participate in blockchain talk.

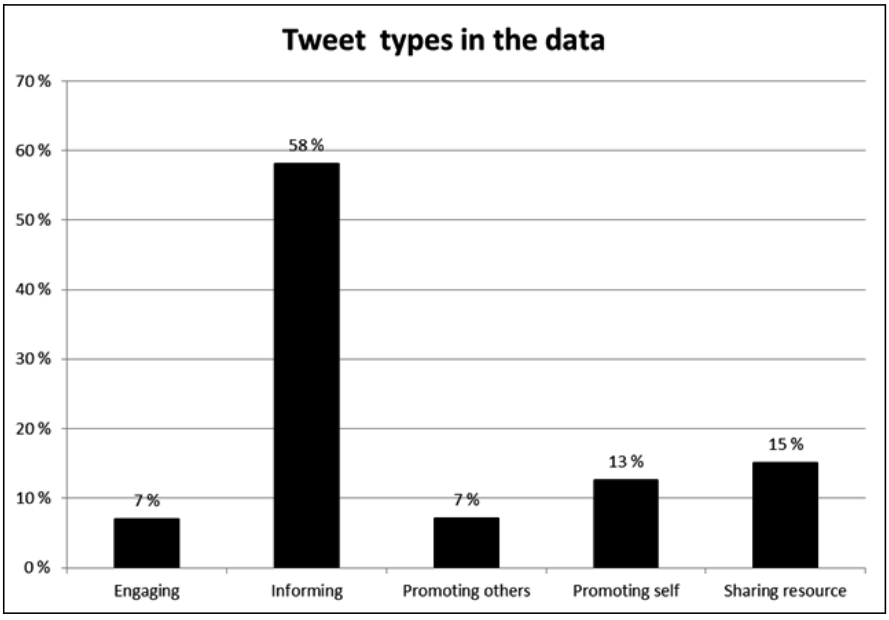

Figure 2: Tweet types in the data. This figure illustrates the percentages of each tweet type.

4.2.1 Engagement

Through engaging tweets, organizations sought to connect with other users, typically those with knowledge on blockchain technology. Thus, they displayed an interest in actively contributing to blockchain discourse on Twitter by publicly discussing the topic with others. Engaging tweets included expressions of agreement or disagreement, as well as giving and requesting advice. Sometimes users directly mentioned one another, but in some cases specific users were not tagged; rather, "Twitter users in general" were addressed, or hashtags were used to direct the message to particular communities, e. g.:

> **Tweet**: "@DigitalistInfo: RT @user_1: I have trouble understanding #blockchain, or rather the groundbreaking benefits of its application. #Digitalist"
>
> **Industry**: Business
>
> **Date**: 21 November 2016

The above tweet is an example of what Lim/Lee-Won (2017) refer to as dialogic retweets. This tweet was most likely retweeted by DigitalistInfo, the official account of Digitalist Global, a company focusing on customer experience, design and technology, because of the hashtag #Digitalist. The original tweeter has added this hashtag with the goal of interacting with DigitalistInfo and its community of followers. Although Digitalistinfo does not reply to the user directly, by retweeting, the organization engages with their followers and potentially connects user_1 with a person willing to inform them. The presence of the hashtag #blockchain connects the tweet to a broader discussion concerning blockchain, and to the community discussing it, but the role of the organization is that of a messenger – they do not directly contribute any information or opinions on blockchain. Rather, they participate in impression management by demonstrating that they want to help their followers in finding relevant information.

> **Tweet**: "@user_2 Dear #internet, tell me an easy way to buy #bitcoin – I have tried two ways and both are #NoGood – #Blockchain"
>
> **Industry:** IT
>
> **Date:** 1 September 2017

In the example above, however, we have a direct request for advice on bitcoin trading. Unlike in the tweet retweeted by Digitalist Global, here user_2 does not link their question to any particular person or organization. Rather, they address the "entire internet", although in reality the tweet is directed at a specific community: those with knowledge on cryptocurrency trading. By addressing a broad audience, user_2 discursively positions themselves as a newcomer in terms of blockchain discourse. The user represents an IT organization, but they do not explicitly connect their own business to the tweet. Thus, they appear to participate in blockchain talk to seek advice from others, instead of highlighting their own expertise or the services of their company. Seeking advice or assistance on social media contributes to impression management, as it involves building relationships with others and displaying the user's awareness of the limits of their knowledge (Fieseler/Ranzini 2015: 506). The public nature of the request is also relevant in terms of impression management. Since user_2 participates in blockchain discourse with a Twitter account linked to an organization, their tweets may contribute to the associations and the image the organization evokes in public.

4.2.2 Information

Informative tweets covered a variety of topics in the data, ranging from sharing general information on blockchain technology to presenting subjective opinions on it. Lovejoy/Saxton, who consider informing as the "basic function of Twitter" (2012: 341), define their "information" category as "tweets containing information about the organization's activities, highlights from events, or any other news, facts, reports or information relevant to an organization's stakeholders" (Lovejoy/Saxton 2012: 343). Park et al. (2016) also include "sharing members' personal stories and experiences" under "informing". Thus, information is conceptualized broadly in earlier literature. Notably, in our data, tweets featuring general information about blockchain were typically not explicitly connected to the organizations' own activities:

> **Tweet:** "@VTTFinland: Will #blockchain revolutionize commerce? Transparency and distribution of information result in a trustworthy approach [link]"
>
> **Industry:** Science and Education
>
> **Date:** 30 August 2017

Tweets like the above appeared frequently in the data. It was common for different organizational representatives to discursively highlight the innovative aspects of blockchain technology through the use of words such as "revolutionize", "hype", or "future". This tweet contained a link to a national newspaper article, which was typical of such tweets. The practice of frequent linking is in line with previous research on organizational communication on Twitter (Su et al. 2017: 575). Here, the tweet containing the link comes from VTT (Technical Research Center of Finland), a state-owned research institution. As an institution operating under ownership of the Ministry of Economic Affairs and Employment, VTT can be seen as having a responsibility to inform the public about news on technical innovation. While the tweet itself does not explicitly state the institution's stance on blockchain technology, they nevertheless express their interest in the topic by sharing the article with their followers. Thus, they indirectly take part in blockchain talk and manage their impression.

Informative tweets where a user stated their own opinion on or experience with blockchain were common. As blockchain is a trending topic, especially in the context of cryptocurrencies, organizations may want to share their interest in it to appear as trailblazers, even if it does not directly concern their organizational activities:

> **Tweet:** "@user_3: I have been spending time outside my comfort zone, learning about #cryptocurrency and #blockchain. I started with #Ethereum. #ETH #blockchain"
>
> **Industry:** Energy sector
>
> **Date:** 25 August 2017

Again, the above tweet is not directly related to the user's organization (an electricity company), but rather their role as an investor, which is also mentioned in their Twitter profile. The information in the tweet may not be of interest to those who follow this user based on organizational affiliation, but it does express an interest in cryptocurrency trading, which can be seen as an impression management tactic that convinces the user's followers they are up-to-date with investor trends. Mentioning an interest in cryptocurrencies publicly on an account linked to an organization may indirectly affect stakeholders' impressions of the organization,

and therefore contain an element of risk. If an organizational representative – one member of the team of performers who contribute to an organization's impression management – posts content that stakeholders do not consider suitable, the overall impression of the organization may be affected (Richey/Ravishankar/Coupland 2016).

4.2.3 Promoting others

Promotion was common in our data, and we divided it into promoting others and self-promotion. A tweet could be seen to promote others if a user highlighted another party's activities, potentially driving traffic to their account. For example, congratulatory tweets such as the following were present:

> **Tweet:** "@BusinessFinland: Congratulations to @user_4 for obtaining the first #blockchain patent in Finland for reliable reporting and recording of geoinformation in e. g. logistics and the supply chain #RebootFinland [link]"
>
> **Industry:** Business
>
> **Date:** 16 February 2018

Even though this tweet mentions a specific user, it contributes to impression management differently than the engaging tweets discussed in 4.2.1. Here, Business Finland demonstrates their own belonging in the Finnish blockchain community by endorsing a key actor in the field. While the tweet addresses user_4, its primary goal is to promote the first blockchain patent in Finland, instead of starting a discussion. Thus, endorsement can also be used for impression management:

> **Tweet:** "@HelsinkiFintech: Instead of hype, would you like to hear real examples of using #blockchain in the financial sector? Come listen to @user_5's talk at Messukeskus on 25 April [link] #blockchain #fintech #digitalfinanceFI"
>
> **Industry:** Economy/Finance
>
> **Date:** 11 April 2018

This tweet illustrates another promotion practice. HelsinkiFintech promotes an upcoming talk by another user. Based on the users' Twitter profiles, they are not directly affiliated – however, considering the presumed audience of HelsinkiFintech, the event is relevant to their stakeholders. They also use the tweet to discursively construct their own legitimacy as a blockchain expert; they are aware of the difference between mere "hype" and "real", useful examples of blockchain application. Again, tagging is not used to engage user_5 in discussion, but rather to advertise the event to an audience and to signal a willingness to be associated with user_5. Even though they are endorsing another actor, HelsinkiFintech still uses blockchain talk to manage their own image.

4.2.4 Self-promotion

In contrast to the promotion of others, self-promotion tweets advertised the user's own services or products. Thus, unlike many other forms of blockchain talk, these tweets were directly linked to the organizations' specific activities:

> **Tweet:** "@user_6: Serving you tech in a way that is understandable even if you are not an engineer. :) #quantumcomputing #blockchain #techtechtech [link]"
>
> **Industry:** IT
>
> **Date:** 5 March 2018

The link embedded in this tweet advertises Microsoft, user_6's organization. Through this self-promotional tweet, Microsoft is discursively portrayed as a company that provides solutions to those who find abstract technical concepts – such as "blockchain" and "quantum computing", illustrated in the hashtags – daunting. Notably, the tweet also contains stylistic features that contribute to impression management. The hashtag "#techtechtech" emphasizes the organization's investment in and passion for all things "tech", while the inclusion of the emoji makes them appear playful. Here, the organization's motivation for participating in blockchain talk seems clear: they are an expert with relevant knowledge to offer, and by promoting their expertise in an accessible way they are able to use it for impression management.

This type of practice of individual accounts sharing their employer's or organization's blockchain-related content was frequent in the data, and it was often achieved through retweeting. In general, retweets can have several goals. They may, for example, contain evaluative assessments of the original tweets (Page 2011: 114). According to Su et al. (2017: 576), retweets can also have a "conversational" aspect, in addition to merely disseminating information – as illustrated by our example in 4.2.1, where DigitalistInfo addressed a question from a follower by retweeting. They can also be used to foster social presence (Lim/Lee-Won 2017). Here, one organizational representative interacts with their organization, thus showing support for their employer's activities. At the same time, as user_6 is publicly associated with Microsoft, they are highlighting their own expertise to their followers.

We also encountered organizations that directly advertised their own blockchain applications:

> **Tweet:** "@ArlaSuomi: We have made the production chain of milk exceptionally transparent. Finally, consumers will be able to follow their milk's journey all the way from the farm into the carton. #milk #blockchain #transparency #responsibility #firstintheworld"
>
> **Industry:** Food industry
>
> **Date**: 20 September 2018

Here, the dairy producer Arla Finland is using Twitter to promote their transparent production chain that utilizes blockchain technology. The company's values, such as "transparency" and "responsibility" are highlighted, but they are also constructing themselves as innovative through language use. They are the "first in the world" to do this, which makes them "exceptional" within their field. While most organizations participated in blockchain talk by sharing news and expressing their interest in learning about the technology, some organizations, including Arla, positioned themselves as active creators and innovators.

4.2.5 Resource

Finally, Twitter users also participated in blockchain talk by sharing resources with their followers. For example, tweets featured blockchain-related documents or materials that others might find useful or interesting, such as reports, blog posts, TED Talks, podcasts, scientific articles, and instructional videos, e. g.:

> **Tweet:** "@Bittirahafi: We have published a new video 'The basics of Bitcoin in 5 minutes' [link] #bitcoin #bittiraha #blockchain"
>
> **Industry:** Economy/Finance
>
> **Date:** 13 July 2016

While the above example can also be viewed as a promotional tweet, the type of resource shared and highlighted – a video that sums up the "basics" of bitcoin – is significant. As the inclusion of links in tweets is extremely common in Twitter communication (e. g. Su et al 2017), it is likely that followers do not click on all the links they encounter on their timeline. In the above tweet, the video was shared by an account associated with Coinmotion, "a registered virtual currency service provider regulated by the Finnish Financial Supervisory Authority" (Coinmotion 2022). By specifying the resource and emphasizing its benefits – the audience will learn the basics of bitcoin quickly – the organization increases its chances of receiving views, while also constructing their own expertise in relation to bitcoin. Although there was relatively little direct engagement between organizations in the data, our analysis illustrates that organizations' blockchain talk features both those who request more information (cf. the first two examples in 4.2.1), and those who take a more active role in providing information and resources. Nevertheless, both types of organizations choose to connect themselves to the broader discourse on blockchain on Twitter by using the relevant discursive features, particularly hashtags.

4.3 Relationship between actors and content

In addition to analyzing the tweets' content, we examined how many tweets were posted by organizations within specific industries. Figure 3 illustrates different industries' participation in blockchain talk.

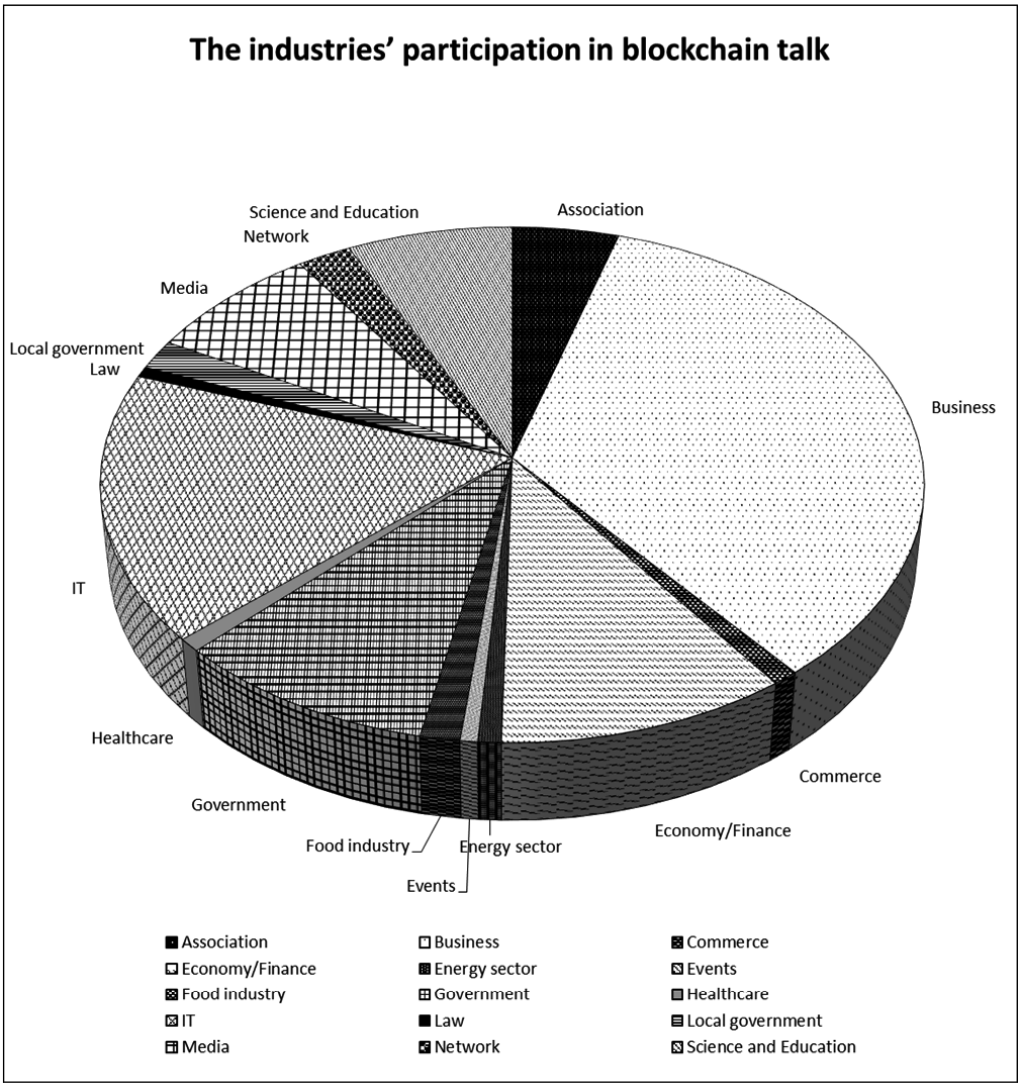

Figure 3: The industries' participation in blockchain talk. This figure illustrates the share of tweets posted using the Finnish hashtag for "blockchain" within specific industries.

By looking at the distribution of the types of tweets in the context of each industry, we were able to get a tentative idea of the relationship between industries and blockchain talk. The percentages of different types of tweets in each industry are displayed in Figure 4 below.

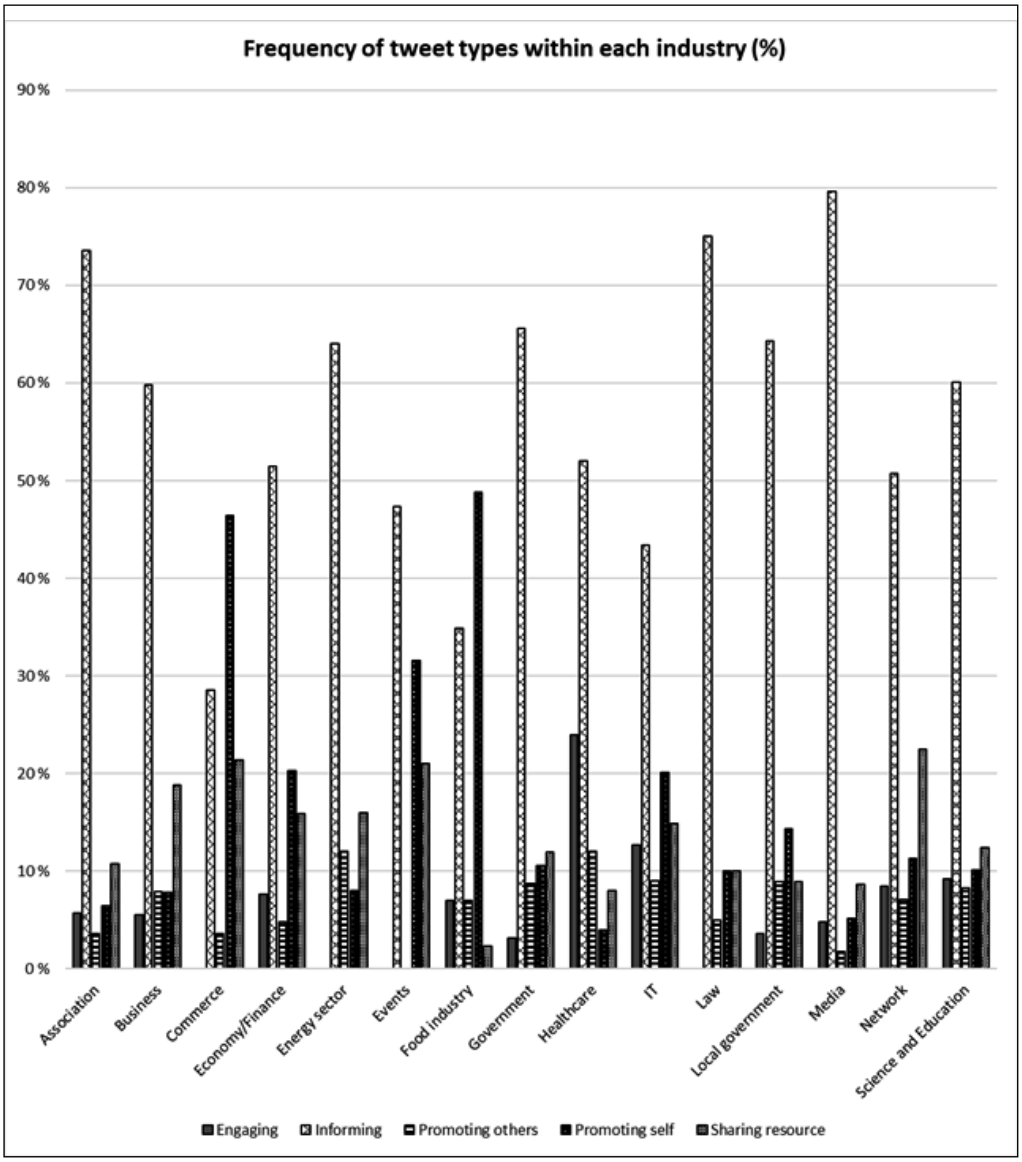

Figure 4: Distribution of tweet types within industries

Figure 4 illustrates that informative tweets were in the majority in most industries that participated in blockchain talk, the only exceptions being commerce and food industry, both of which had the highest percentage of tweets in the category of self-promotion. A possible explanation can be found through examining the actors that were active in these two fields, and their tweets.

Most food industry users and their tweets were connected to the dairy producer Arla Finland, who were promoting an application of blockchain technology to their production chain (see 4.2.4). Thus, blockchain technology in general was not necessarily a popular topic of dis-

cussion among the Finnish food industry, but a specific actor in the field was doing something innovative with blockchain and promoting it on Twitter. Similarly, most users within the commerce category were connected to S Group, a major Finnish wholesale business and a chain including supermarkets, department stores, and other retail shops (S Group 2021). Their tweets promoted S Group's innovation called "kuhatutka" ("zander radar"), an application developed using blockchain technology and used to trace the origin of fish. Like representatives of Arla Finland, the representatives of S Group were tweeting about blockchain because their organization had launched a blockchain-based service. Interestingly, both organizations promoted a blockchain-based innovation linked to transparency and responsibility in food production and supply. Their blockchain talk was connected to organizational values, thus functioning as impression management.

We also observed differences between industries in the engagement category. As illustrated in Figure 4, engaging tweets were absent in commerce, the energy sector, events, and law, while the field of healthcare contained the highest percentage of engagement. This may be due to the fact that building relationships with the public is an important communicative purpose for health organizations (Park/Reber/Chon 2016: 188). For the category of commerce, the lack of engaging tweets may be connected to the fact that the majority of the tweets were centered around S Group's new blockchain application. Event organizers likely focus on promoting/informing people about their event, as this category also contained zero tweets that promoted others. In their study on the Twitter use of science festivals, Su et al. (2017) did find tweets that had participatory features, but the majority of the tweets focused on one-way communication with an emphasis on disseminating information. In our data, tweets from actors in law and the energy sector were also heavily focused on such one-way, information-heavy communication.

5 Discussion and conclusion

As we have shown in this study, blockchain talk on Twitter offers organizations plenty of opportunities for impression management. Through blockchain talk, organizations can manifest their expertise and progressiveness, as blockchain is both an abstract technology and an array of practical, experimental applications. By analyzing different types of organizational tweets that contain the Finnish hashtag for "blockchain", we have mapped the range of organizational performers who participated in blockchain talk in the Finnish Twittersphere in 2015–2018, identifying the industries that were involved in this activity. In addition, we have illustrated how the organizational discourse on technological innovation is intertwined with impression management and made visible on Twitter through the use of hashtags.

We conclude that most organizational tweets (58 % of the tweets in our data) participate in blockchain talk by *disseminating information* on blockchain-related topics. However, within specific industries the largest number of tweets was posted by organizations that promoted their own concrete blockchain experiments. Understandably, organizations are more likely to promote themselves than others. Overall, promotional tweets – including both *self-promotion* and the *promotion of others* – made up roughly 20 % of all tweets in the data, while 15 % of the tweets featured the users sharing blockchain-related *resources*. *Engagement* was less common, with 7 % of the tweets aimed for engaging other users in conversation about blockchain. However, we also noted some differences between particular industries in terms of engagement – for example, 24 % of the tweets from healthcare organizations featured engagement. Thus, there is evidence that industries participate in discussions around technological innovation in

specific ways. Further studies are needed to investigate such differences in more detail. Overall, however, the prevalence of the informative tweets indicates that the one-to-many model of communication still prevails in organizational communication on Twitter (e. g. Etter 2014, Lovejoy/Saxton 2012, Okay/Ašanin Gole/Okay 2021, Su et al. 2017), at least in the context of discussions on innovations like blockchain. This is notable because previous research has also demonstrated that dialogic approaches to Twitter communication would benefit organizations (Lim/Lee-Won 2017, Wang/Yang 2020).

As our analysis demonstrated, a practice like blockchain talk can be used to discursively position organizations in relation to technologies and the associated hype. Tweeting about blockchain was used to construct expertise and to highlight organizational values in our data. There were organizations such as Microsoft who appealed to their audience by offering simplified solutions to blockchain, attempting to decrease their stakeholders' presumed fear of complicated technical concepts. Certain organizations, as we saw in the case of Arla Finland and S Group, had also harnessed blockchain to the service of transparency and sustainability, thus turning blockchain talk into value-based communication. Highlighting specific values in such a way can be connected to the "elite-circle" nature of the Finnish Twittersphere, which has been established in previous literature (Ruoho/Kuusipalo 2019).

Finally, it is noteworthy that even those organizations that did not have their own blockchain applications engaged in blockchain talk. This may be because the topic is "trendy" and it allows them to appear as trailblazers – however, further research is required in order to figure out what exactly motivates these organizations. As we demonstrated through the examples, many organizational actors emphasized the fact that they were "new" to blockchain, and their willingness to interact with experts in the field (although direct interactions rarely took place). When it comes to discussing technological innovation, sharing news and general information might be an easy and relatively "safe" way for organizations to engage in impression management. Through mostly informative tweets, organizations can benefit from the "hype" of technological innovation, without having to invest their resources in actual applications of the technology. However, as illustrated by the presence of some engagement between users and the promotion of others in the data, Twitter also allows organizations to form and maintain ties with other organizations by showing support and building dialogue, which can also function as impression management.

By discursively emphasizing aspects such as reliability, relatability and transparency in their social media communication, organizations can strengthen their public image in the eyes of their stakeholders. Interestingly, while such positive organizational values were associated with blockchain talk in our data, the tweets did not contain much explicit problematization of the technology. For the most part, the organizations who tweeted about blockchain technology either adopted a "neutral" stance towards it, or highlighted its benefits instead of potential challenges (Lynn/Rosati/Fox 2018). For instance, the Finnish word for "environment" only occurred in sixteen tweets in the data, which illustrates that, at least during the time period under investigation in our study, organizations did not engage in much critical discussion on the environmental concerns related to blockchain technology (e. g. Polemis/Tsionas 2021).

The present study can be considered exploratory and focuses on the perspective of the organizational accounts which tweeted using the hashtag #blockchain – in other words, those who send out messages to their intended audience. In the future, further explorations into the role of this intended audience from a stakeholder perspective are needed. When tweeting about blockchain technology, or similar technological advancements, do organizations aim

to address and influence customers, competitors, and/or even political decision-makers? Is blockchain talk in-group communication, or do these organizations truly aim to participate in broader public discussions? Such questions could be answered by studying, for example, the audience reception of tweets through a closer examination of likes and retweets.

This article has focused on a specific geographical and cultural context: Finland and the Finnish Twittersphere. In addition, our focus has been on early blockchain discourse, as the data was collected from the first three years following the appearance of the Finnish hashtag for #blockchain on Twitter. While these local and temporal foci can be viewed as limitations, they can also be considered a strength, as they have allowed us to gain a more profound understanding of the roles of specific organizations and their strategic orientation towards both blockchain technology and the use of Twitter in organizational communication. In the future, comparisons between local and global practices of engaging in discussions around technological innovations are necessary in order to understand how new technologies (e. g. Artificial Intelligence, NFTs) are introduced, negotiated, and utilized in the discursive context of social media.

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