Blockchain technology, leadership competencies, and organizational change: A conceptual exploration and future research agenda

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Abstract

Building on socio-technical systems (STS) theory, this chapter explores the change processes that organizations go through as they implement blockchain in their operations. The chapter explores the interplay between the adoption of blockchain as a new disruptive technology and organizational change as a process and argues that a new kind of leadership and competencies are required as organizations engage in and carry out organizational change. Yet, the chapter finds that the current theoretical and empirical development of leadership in the context of blockchain adoption remains insufficient. To address this gap, this study proposes a conceptual framework that builds on STS theory and existing literature on organizational change and leadership. It aims to contribute to the existing literature in two main ways. First, it develops a conceptual framework connecting organizational change and leadership competencies, on the one hand, with the specific features of blockchain technology, on the other hand. Second, it derives several propositions and proposes a research agenda for future research on the linkages between organizational change, leadership, and the adoption of an insufficiently understood technology. In so doing, this chapter focuses mainly on what Rost calls the peripheral elements of leadership theory.

Introduction

This research conceptually explores the interplay between the adoption of blockchain as a new disruptive technology and organizational change as a process and argues that a new kind of leadership (Clegg et al., 2021) and competencies are required as organizations engage in the implementation of blockchain. By emphasizing competencies for digital transformation, this research studies primarily the peripheral, yet important, elements of leadership theory (Rost, 1993). Digital transformation is being witnessed in both public and private organizations. It contributes to the creation and development of existing and new products and services and facilitates customer experience and a reconsideration of existing organizational arrangements and processes (Vial, 2021). The understanding of how humans and technology interact in digital transformation has been developed by the socio-technical systems (STS) theory and applied to organizational change (Appelbaum, 1997; Cherns, 1976; Pasmore et al., 2019; Sony & Naik, 2020).

The STS theory has been considered in the context of several technologies, including the ones in Industry 4.0. However, there is an increasing understanding that "even the successful tech firms… have not found ways to keep their social systems advancing as quickly as their technology" (Pasmore et al., 2019, p. 72). Therefore, STS design in contemporary organizations should shift from linear to iterative, from project-based to ongoing, and from a single organization to an ecosystem-driven process (Pasmore et al., 2019). This is particularly true when designing organizational change based on emerging, open-source technologies and decentralized ledgers (Kouhizadeh, Saberi & Sarkis, 2021). Blockchain removes intermediaries and can establish trustworthy transactions without external supervision (Woodside et al., 2017). Therefore, new thinking about leadership and its capacities is required to organize work and retain and enhance organizational functionality and relevance.

Although the STS theory offers a detailed overview of change resulting from the adoption of new technologies (Sony & Naik, 2020), it has not yet considered the conditions under which leadership might be seen as redundant. We argue that understanding what leadership competencies and capacities are necessary when adopting a novel and insufficiently understood technology warrants a separate inquiry, in which we engage in this chapter. This chapter's central research question is: *What kind of leadership and competencies are needed to change organizations and implement blockchain technology?*

Building on the specific features of blockchain and the theoretical underpinnings of the STS theory, we design a framework to shed light on leadership competencies and capacities that leaders require to implement blockchain within their organizations. By doing so, we aim to contribute to rethinking leadership and organizational change in view of the growing digitalization of our lives, societies, and economies (By, 2021; Clegg et al., 2021). We aim to extend the theorization of STS and reframe and adapt its theoretical explanations to the newest technologies in Industry 4.0. We posit that blockchain technology, in particular, given its unique features, has been considered in both digital transformation (Imran et al., 2021; Noorit et al., 2020) and STS theories (Pasmore et al., 2019; Sony & Naik, 2020). This raises questions about the relevance of the STS theory in a blockchain context, which has the potential to act as a driver in changing our current understanding of leadership and its contribution to stimulating and sustaining organizational change (Ford et al., 2021).

Socio-technical systems theory and digital transformation: connecting the dots

Different theories have been employed to study the technological phenomenon. In socio-material theory, technologies are viewed as a group's experiences gained from the local environment. Thus, environmental actions, business, and human interactions among others occur. According to Orlikowski (2007, p. 1437), the material and social are inseparable – "there is no social that is not material and no material that is not also social". Structuration theory (Giddens, 1979) has also been utilized to examine the technological phenomenon. Nonetheless, it has suffered from criticism such as not being consistent in terms of structural details of technology (Jones & Karsten, 2008).

The most widely adopted theory is STS (Imran et al., 2021), which considers the interplay between social and technological factors during change processes (Pasmore et al., 2019). It also emphasizes the necessary skills for navigating technological change (Sony & Naik, 2020). STS underscores the importance of addressing both technical and social aspects to drive change within an organization (Cherns, 1976). At its core, this theory views organizations as intricately connected within a complex work framework, acknowledging the dynamic interactions between individuals and technology, as well as the complexities inherent in the interplay between societal infrastructure and human behavior (Cherns, 1976). STS advocates for joint optimization, where social and technical systems are concurrently designed to facilitate their collaborative functioning (Appelbaum, 1997; Cherns, 1976). The STS philosophy emerged from the UK Tavistock Institute's research into introducing new mining machinery (Davis et al., 2014). It emphasizes the interconnectedness of technology and the social aspects of work, stressing the need to consider the human factor in technological change (van Eijnatten, 2013). This theory provides a comprehensive understanding of how organizational transformation results from technological changes and the necessary competencies for managing them (Sony & Naik, 2020). STS aims to integrate humans and technical systems to create new opportunities for work and pave the way for technological change (Trist, 1981).

Studies have applied STS theory to explore digital transformation and leadership competencies in organizations (e.g., Imran et al., 2021). However, these studies often lack a detailed examination of the specific individual capabilities and competencies required for driving change related to particular technologies. Furthermore, Pasmore et al. (2019) suggest that STS principles should evolve alongside Industry 4.0, viewing digital transformation as a continuous, iterative process that considers the ecosystem, organization, and individuals, especially the self-directed management crucial for the emerging Next Gen workforce. Therefore, there's a need for a deeper understanding of these actors and the new competencies required to facilitate change in the implementation of advanced technologies like

blockchain, emphasizing workforce independence, ongoing change, and ecosystem thinking (Kouhizadeh et al., 2021).

The distinctive features of blockchain technology

Blockchain is a decentralized ledger that records transactions in data blocks linked by cryptographic pointers (Kouhizadeh et al., 2021). It promotes transparency and trust, granting all parties access to information through nodes and chain blocks (Downie & Parker, 2019). Longer chains enhance trust by making modifications difficult (Cole et al., 2019; Morkunas et al., 2019). It leverages the internet as infrastructure for transaction records and consensus rules (Smith, 2017), making it a versatile technology for digital asset exchange in distributed networks (Ølnes, Ubacht & Janssen, 2017). Blockchain gained popularity in 2008 with Nakamoto's article "Bitcoin – A Peer–to–Peer Electronic Cash System," revolutionizing information transactions and business operations. Scholars, including Morkunas et al. (2019), advocate for more research on how blockchain impacts organizational innovation models and value creation. Numerous organizations and countries recognize its potential. For instance, El Salvador embraced Bitcoin as an official legal tender, Lithuania issued the world's first state-backed digital collectible coin, and China introduced its digital Yuan, akin to Bitcoin (Areddy, 2021). It's no surprise that blockchain is projected to contribute 10% to global GDP by 2027 (World Economic Forum, 2015).

Blockchain technology has been empirically researched in various industries, such as its impact on supply chain management (Cole et al., 2019), its role in disrupting real estate development in the Netherlands and international markets (Veuger, 2018), its relevance to addressing barriers in sustainable fashion retailing (Caldarelli et al., 2021), and the hotel-hospitality industry (Chan, Okumus & Chan, 2015). It has also been examined in the context of talent retention during change management (Vineyard et al., 2020; Woodside et al., 2017). Several distinctive blockchain features, including open disruptive innovation, flexibility, transparency and trust, and networking, necessitate specific leadership competencies when driving organizational change toward blockchain adoption. We will further explore these features and their significance as catalysts for change in blockchain adoption within organizations.

Open disruptive innovation – disruptive technologies have become a prominent concern in boardrooms (Evans, 2017). Blockchain's decentralized nature is causing disruption across various industries by authenticating traded goods, disintermediating processes, and reducing transaction costs. This compels practitioners to adapt their business models urgently to maintain competitiveness (Nowiński & Kozma, 2017). Veuger's (2018) research on blockchain's impact on the real estate industry in the Netherlands and

internationally highlights how real estate is innovating in response to blockchain-induced disruptions, capitalizing on new opportunities. Woodside et al. (2017), using a mixed-method approach to investigate blockchain technology acceptance from a managerial perspective, also confirm blockchain's status as a disruptive innovation affecting diverse sectors, including finance, accounting, and various marketplaces. Blockchain is fundamentally reshaping business models and operations across industries. In the insurance sector, blockchain has revolutionized claim settlement, enhancing speed, transparency, and trust (Grima et al., 2020). Claimants are now active participants in the process, accessing real-time information, unlike the previous practice of organizations controlling information dissemination. Ordinary individuals are increasingly collaborating with organizations, resulting in significant improvements in operations and supply chain management. These improvements encompass inventory management, reduced intermediaries, and the stimulation of new product development, all facilitated by blockchain (Grima et al., 2020). Customer order management processes have become more efficient and streamlined with blockchain implementation (Martinez et al., 2019). On a philosophical note, blockchain has been found to actively shape financial transactions, solidifying them gradually, replacing human interaction with automated code, and exerting a substantial impact on social aspects like cryptocurrency (Reijers & Coeckelbergh, 2018).

Flexibility – blockchain technology has been hailed as bringing flexibility to business operations and transactions. For example, blockchain implementation and its absorption by industries have resulted in a change in orientation by users and owners of real estate which has contributed to bringing about flexibility in property management (Veuger, 2018). The financial industry is experiencing the features of blockchain in the delivery of services and the entirety of business operations. Peterson's (2018) study highlights this line of discussion that blockchain advances flexibility in different capacities in the financial industry. For instance, sleeve-level performance can be computed with ease, and the prospect of after-tax performance computation, simplifies total sleeve-level bases – thus, easing financial reporting and enhancing unified managed accounts (Peterson, 2018).

Transparency and trust – blockchain is seen as a technological advancement, particularly notable for its inherent transparency, which empowers all stakeholders and creates trust rather than concentrating power on top management. This transparency and trust address the growing demand among practitioners and the public for comprehensive insights into transactions and business operations, making blockchain a promising solution (Caldarelli et al., 2021). For instance, in an exploratory study, Caldarelli et al. (2021) found that blockchain records the entire production process, from raw materials to the final product,

allowing anyone to check and verify, instilling confidence in consumers and other stakeholders regarding production and sustainability. This inclusive approach makes previously overlooked individuals critical partners in the production process. Similarly, in the context of supply chain management, blockchain offers transparency that enhances quality management by providing visibility and easy access to batch information, aiding in recalls, advancing services, automating contracts, and reducing the need to establish trust within the supply chain (Cole et al., 2019). Martinez et al. (2019) also highlight the transparency and trust brought about by blockchain in customer orders and services. In the banking sector, blockchain adoption streamlines lengthy verification processes and supports the automation of accounting services through AI. Major global accounting firms such as KPMG, PwC, Deloitte, and Ernst & Young utilize blockchain in diverse contexts to enhance their financial service provision and delivery (Downie & Parker, 2019). The insurance industry utilizes blockchain to improve transparency, addressing issues like manual procedures (Grima et al., 2020). Peterson's (2018) research recognizes blockchain's potential to simplify reporting in the financial sector, enabling real-time access to ledger records for authentic transaction monitoring. In healthcare, blockchain enhances transparency in managing patients' data (Shahzad et al., 2024).

Networking – blockchain relies on ledgers involving multiple stakeholders within a network. Beyond financial applications, blockchain has demonstrated its capacity to foster collaboration among diverse groups, including scientists, businesses, policymakers, and research funding bodies, through platforms like IdeaChain (Burmaoglu et al., 2020). IdeaChain functions by initiating ideas from scientists and researchers, translating them into products and services by businesses and industry, and finally, guiding the process through policymaking to address legal, social, and ethical aspects (Burmaoglu et al., 2020). In the medical and healthcare sector, blockchain facilitates networking, enabling secure two-way communication and information exchange among doctors, nurses, patients, and other relevant stakeholders (Shahzad et al., 2024). Blockchain yields both economic and noneconomic outcomes.

In *economic terms*, numerous studies (Caldarelli et al., 2021; Grima et al., 2020; Kouhizadeh et al., 2021; Martinez et al., 2019; Michelman, 2017; Peterson, 2018; Woodside et al., 2017) emphasize cost savings. For instance, Martinez et al. (2019) highlight reduced customer order processing times, Grima et al. (2020) note decreased insurance claims costs, and McKinsey & Company (2017) projects significant cost savings of $50–$60 billion in cross-border B2B payments. Additionally, blockchain helps combat illegal counterfeiting by providing information about authentic fashion products (Cole et al., 2019). Noneconomic benefits manifest as enhanced efficiency (e.g., Burmaglou et al., 2020; Kouhizadeh et al.,

2021; Martinez et al., 2019; Nowiński & Kozma, 2017) and improved transparency and trust (e.g., Cole et al., 2019; Peterson, 2018; Veuger, 2018). Lumineau et al. (2021) explored how the unique features of blockchain change governance models noting that one of the key questions for future research is "*What kinds of actors can be the most effective in using blockchains to govern collaborations?*" (p. 514). As organizations keep experimenting with blockchain adoption and there are few use cases that would allow empirical investigation and generalized conclusions about the leadership competencies needed to lead the change toward blockchain implementation, we engage in a conceptual investigation and build our suggestions bridging insights from STS, change management, leadership, and blockchain research.

Conceptual framework: leadership and organizational change for blockchain Implementation

Leadership is a pivotal factor in effective change management, involving the initiation of change awareness within the organization, planning, explaining implementation strategies, organizing training, and assigning responsibilities. According to Dzwigol et al. (2019), leadership is essential across various subsystems at the strategic management level of a firm to drive change, advance human resources, and foster innovation within the organization's lifecycle. The absence of strong leadership, as seen in supply chains, can hinder the successful implementation of blockchain and ethical sustainability practices (e.g., Hughes et al., 2019; Luthra et al., 2016). Leadership competencies encompass the knowledge, skills, abilities, and attributes required for effective leadership (Das et al., 2011). These competencies are instrumental in driving digital transformation within organizations (Horlacher et al., 2016). While existing literature has predominantly focused on developing profiles like Chief Digital Officers or Chief Technical Officers responsible for leading digital innovation initiatives, there is less explicit guidance on the competency requirements for leaders tasked not only with operational digital innovation projects but also with preparing their organizations for broader organizational change.

Complexity leadership theory, as described by Uhl-Bien et al. (2007), identifies adaptive, administrative, and enabling leadership as crucial qualities in driving technological transformation. Adaptive leadership involves creative, learning actions emerging from interactions within complex adaptive systems to address tension or constraints. Administrative leadership pertains to formal managerial roles planning and coordinating activities efficiently to achieve organizational goals. Enabling leadership aims to create conditions for adaptive leadership to thrive and manage the interplay between bureaucratic and emergent functions in the organization (Uhl-Bien et al., 2007). From an adaptive leadership perspective, Kane et al. (2019) conducted a global survey and interviews, concluding that effective digital

transformation hinges on leaders possessing qualities like adaptability, creativity, and decisive action. Administrative leadership qualities within groups and individuals also play a vital role in successful technology adoption (Dzwigol et al., 2019; Noorit et al., 2020; Philpot & Monahan, 2017). Scholars, including Imran et al. (2021), have emphasized the importance of leadership competencies encompassing adaptability, a positive attitude, effective communication, open-mindedness, technical expertise, and a willingness to experiment. These competencies act as catalysts for achieving agility, customer-centricity, and collaboration. We, therefore, move to offer the following proposition:

Proposition 1 (P1): For any blockchain implementation, leadership flexibility is required to undergo technological adoption by the organization.

The preceding discussion underscores that the adoption and implementation of blockchain are not isolated endeavors. Organizations must embrace new technology and disruptive innovations to ensure continuity and gain a competitive edge. This transition inherently brings about change, necessitating appropriate leadership competencies to steer management policies forward. The introduction of blockchain into an organization necessitates adjustments that drive digital transformation, a process inherently characterized by change, as evident in the literature. Several studies shed light on the prerequisites for embracing new technologies like blockchain. For instance, Vineyard et al. (2020), drawing on the Learning, Enhancement, Advancement, and Development model, elucidate that organizations looking to successfully adopt blockchain must first embrace change, cultivate a customer-centric perspective, establish career development paths, and devise retention strategies to achieve their objectives. The authors emphasize adhering to ADKAR guidelines: creating awareness about the necessity for change, fostering a desire for collaboration, ensuring understanding of how to implement change, and providing the necessary resources and training to facilitate the transition (Vineyard et al., 2020).

The allure of blockchain's benefits prompts organizations to transition to its use. Studies have delved into how blockchain adoption unfolds within organizations. Employing a mixed-method approach grounded in the diffusion of innovation theory, Woodside et al. (2017) highlight factors like transparency, trust, user control, and quality (particularly in safeguarding against fraudulent activities) that motivate organizations to embrace blockchain technologies. Michelman (2017) also illustrates that organizations are adapting to new technological advancements through blockchain due to its simplicity and the benefits it offers, which outweigh existing business models. This adaptation process entails a thorough evaluation of current systems in terms of cost benefits and resource commitments that will benefit the organization following the integration of the new technology (Michelman, 2017). However, it's essential to acknowledge that

not all changes encounter smooth acceptance. Some organizations face resistance to adopting new technology due to the comfort associated with existing systems and uncertainties regarding the benefits of transitioning to new technology, which can impede change. Consequently, it is apparent that adopting blockchain, driven by its associated benefits, necessitates organizational changes, and leadership qualities are indispensable in facilitating this transformation. In light of these considerations, we propose the following:

Proposition 2 (P2): Blockchain adoption by the organization brings about more inclusiveness of stakeholders; thus, leaders should have the knowledge and the ability to embrace these stakeholders when taking organizations over the transformation.

Discussion and implications

The current study addresses a conceptual examination of the following research question concerning blockchain implementation, global leadership competencies, and change management underpinned by STS theory. *What leadership competencies are needed to transform organizations to adopt and implement blockchain technologies?* The literature on digital transformations broadens our knowledge about technological systems and the social aspects that need to work in harmony to progress with change that occurs from technologies such as blockchain. The social aspects of STS theory exhibit the importance of the human element in the transformation of technology in an organization (Singh & Hess, 2020). Nonetheless, our understanding of these individual actors who play a meaningful role in the implementation of new technologies has been limited. Through our conceptual model development, we have shown that other individual actors also play a meaningful role in the transformation of digitalization such as blockchain. In that respect, we extend the STS theory and its application in understanding the adoption of new technologies in organizations.

Leadership competencies are crucial for digital transformation, particularly for those spearheading the shift to new technologies. Top-level management consistently emerges as a key driver of technological change in organizations (e.g., Kane et al., 2019; van Hoek, 2019). Leadership attributes, encompassing knowledge, skills, and abilities, are intrinsic qualities that assume paramount importance during change processes (Das et al., 2011), especially in the context of digital transformation (Horlacher et al., 2016). However, possessing these attributes alone is insufficient. Effective leadership roles extend to various facets, including raising awareness of digital transformation topics, fostering collaboration, driving

technological change, cultivating digital transformation culture, setting exemplary standards, promoting mentoring and coaching, exhibiting strategic followership, enhancing transparency and trust throughout actions and the organizational value chain, and aligning with core values (Imram et al., 2020). This underscores the fact that digital transformation is not solely the domain of top-level management; the leadership skills of individuals and groups involved in administrative tasks within the organization also wield significant influence (Dzwigol et al., 2019; Noorit et al., 2020; Philpot & Monahan, 2017). These individual leadership skills contribute effectively to support managers and the lifecycle of firms within organizational and innovation subsystems (Dzwigol et al., 2019).

Theoretical contribution

An important gap in the conceptualization of blockchain has been especially the neglect of the kind of leadership and capacities that are required for its implementation (Downie & Parker, 2019). These are critical for organizational success in the digital era (Kane et al., 2019). Existing research has found that driving digital transformation requires leadership qualities and capacities, such as the ability to spread awareness of digital technology, promote collaboration, and sustain efforts over time (Janssen et al., 2020). Besides, little is known about the process of digital transformation and the role that blockchain actors play in enacting it. We argue that these actors play a meaningful role in the transformation process to ensure that the new technology is integrated smoothly into the organization. We propose that blockchain technology implementation should incorporate leadership competencies and organizational change (Figure 2.1).

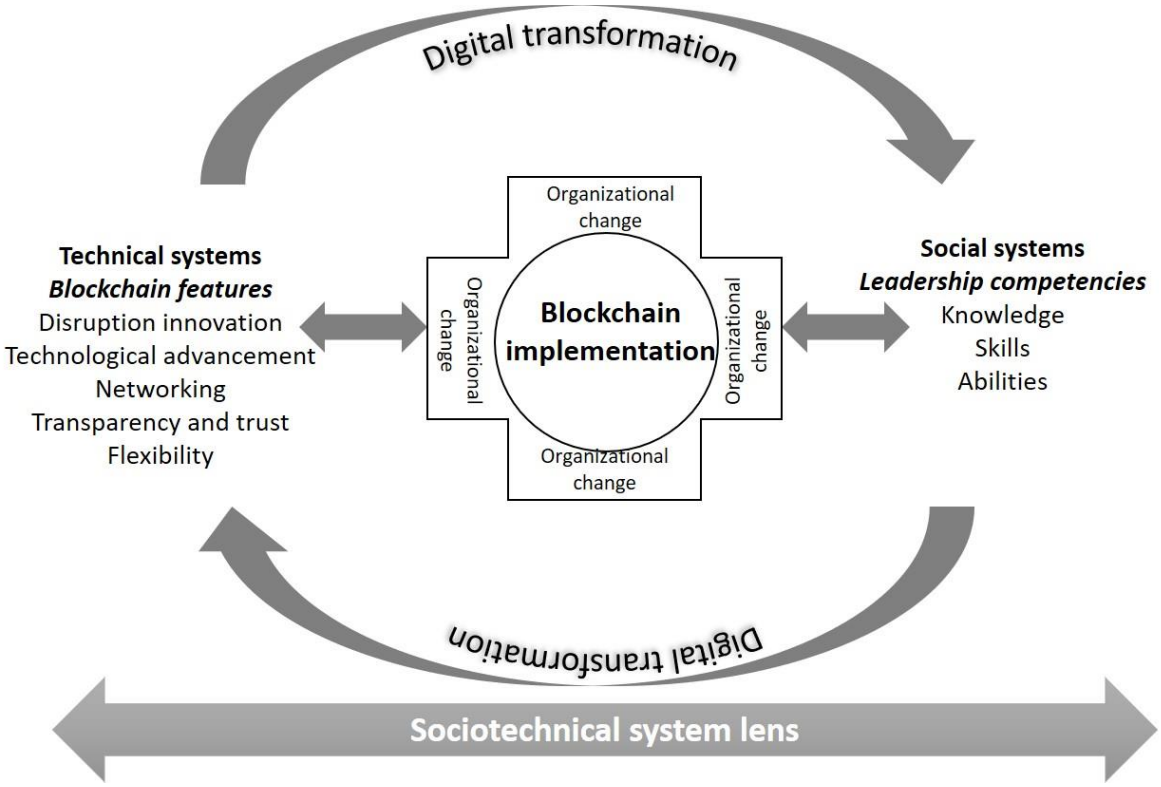

Figure 2.1 illustrates that blockchain implementation is a complex process involving multiple considerations. Embracing the social perspective of technology is pivotal for organizational transformation through the adoption of new technologies like blockchain. In this context, the successful implementation of blockchain in organizations relies on well-defined processes executed by human elements within the organization. Effective supervision, typically provided by managers, is essential to ensure a seamless transition. Our framework underscores the importance of various attributes working harmoniously to facilitate this transition, recognizing the interplay between technological systems, represented by blockchain, and social systems, exemplified by human actors including top-level management and individuals. Given the dynamic nature of the digital era and the disruptive potential of blockchain in revolutionizing existing technological capabilities, there arises a pertinent question regarding the suitability of current theoretical perspectives in the literature. Consequently, scholars in the emerging fields of digital transformation and disruptive innovation are encouraged to explore these issues, thus advancing our collective knowledge in this domain.

Conclusion and future research agenda

We have aimed to emphasize the integration of blockchain implementation, digital transformation, and leadership competencies. Our expectation is that leadership competencies, particularly those exhibited by individual actors involved in blockchain implementation in both private and public organizations, have been underscored as a crucial and timely focus within the nascent field of blockchain studies. We hope to contribute an integrative lens for studying blockchain, recognizing the existing omission of leadership competencies essential for driving change in blockchain implementation. Furthermore, leadership attributes have been established as imperative for digital transformation (Reck & Fliaster, 2019). Our conceptual framework strives to address this gap in the literature by bridging studies on blockchain, digital transformation, and leadership competencies. Building on this foundation, we contend that a comprehensive understanding of blockchain necessitates the integration of change management and leadership competencies into blockchain technology implementation. Additionally, we posit that the change process, management interventions, and requisite leadership competencies present an opportunity to explore an empirical gap, shedding light on the managerial procedures undertaken during the transition to blockchain and their alignment with established knowledge regarding radical organizational change and digital transformation. Our proposed conceptual framework in Figure 2.1 is expected to offer practical implications for practitioners. Change is not a straightforward exercise whether for a small or large organization. Therefore, to implement blockchain in an organization our framework can guide managers to understand the causes of, mediums, resources, and capabilities to effect the change.

Although there are academics, practitioners, and policymakers interested in blockchain, knowledge gained about the concept is somehow fragmented and nevertheless not incorporated into a higher level of theorization within the confines of change management and leadership competencies literature. This important displacement existing among theory and practice is our contention here (Shepherd & Suddaby, 2017) and we argue that needs to re-examine how critical leadership competencies and change management are to blockchain adoption and implementation. This study provides a foundation for future research directions. Firstly, it is important to transition from conceptual exploration to empirical testing, validating the ideas presented here. Additionally, while we've focused on social contexts in this study, exploring the cultural implications of blockchain adoption remains an intriguing avenue for further research. Cultural differences may impact blockchain's application and implementation across borders, warranting investigation. To realize blockchain's potential for various stakeholders, future studies should delve into its implementation and outcomes, incorporating perspectives from change management and leadership competencies. By examining how these factors intersect with blockchain adoption, we can

identify the necessary leadership competencies at each stage of the transformation process and understand their resulting impact. This knowledge is particularly valuable for large organizations, including government institutions like tax and social benefit authorities, seeking to adopt blockchain effectively.

Management and organizational theory have historically overlooked the significance of context (Matthews et al., 2018). However, blockchain technology has the potential not only to disrupt policies and services, but also to introduce a new institutional governance technology that can enhance existing organizational processes. Consequently, a comprehensive conceptual framework for blockchain adoption and implementation, incorporating change management and leadership competencies, represents a crucial advancement for scholars investigating the antecedents, barriers, and causal mechanisms of blockchain technology. This is particularly relevant for theory-building efforts that underscore the pivotal role of context in understanding blockchain technology. Some authors have already begun employing theories such as STS to examine digital transformation and the requisite leadership competencies within specific contexts (e.g., Imran et al., 2021). Given the relevance of context in the business landscape and the growing interest in blockchain research among academics and practitioners alike, we argue that exploring approaches to gain insights into this disruptive innovation, which has already demonstrated its revolutionary potential, is essential.

Studies have enlightened us about the critical role of leadership in digital transformation, including the domain of blockchain. However, digital transformation is a multifaceted challenge in management and organizations. We require insights into the mechanics of technological transformation, encompassing the change process itself. This could be achieved through real-time observations (Pettigrew, 1992), longitudinal studies detailing the duration and evolution of the change process (Hassett & Paavilainen-Mäntymäki, 2013; Van de Ven, 1992), or retrospective analyses (Sonenshein, 2010) examining past change efforts. While a few studies (e.g., Kane et al., 2019; Michelman, 2017) have touched upon leadership qualities essential for digital transformation, including blockchain, we align with Imran et al. (2021) in advocating for expanded research on leadership, organizational structure, culture, and their performance implications within the context of blockchain. Furthermore, longitudinal research is needed to explore interconnected issues that may pose challenges to the seamless implementation of blockchain technology within organizations, and to evaluate the resulting impacts on efficiency, transparency, and traceability (Kouhizadeh et al., 2021).

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This study was supported by the Foundation for Economic Education in Finland under Grant agreement (200264 and 210257) project Brothers from a different mother? How businesses and public sector organizations develop leadership competencies and change processes for blockchain implementation (BizPub)

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