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How can NGO accountability practices be improved with technologies such as blockchain and triple-entry accounting?

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Purpose: The purpose of this paper is to explore how blockchain and triple-entry accounting technologies may improve non-governmental organisation (NGO) accountability by amplifying the social and economic outcomes of aid. It also provides a critique of these technologies from an accountability perspective.

Design/methodology/approach: An in-depth case study of a large NGO, relying on semi-structured interviews, document analysis and non-participant observation, provides an understanding of current issues in existing NGO accountability and reporting systems. A novel case-conceptual critical analysis is then used to explore how blockchain and triple-entry accounting systems may potentially address some of the challenges identified with NGO accountability.

Findings: An empirical case study outlines the current processes which discharge accountability to a range of stakeholders, emphasising how ‘upward’ accountability is privileged over other forms. This provides a foundation to illustrate how new technology can improve upward accountability to donors by enabling more efficient, accurate and auditable record-keeping and reporting, creating space for an NGO to focus on horizontal accountability to partner organisations and downward accountability to beneficiaries. Greater accountability exposes NGOs to diverse views from partner organisations and beneficiaries, potentially enhancing opportunities for learning and growth, i.e. greater impact. However, blockchain and triple-entry accounting can also create ‘over-accounting’ and further entrench the power of upward stakeholders, such as donors, if not implemented carefully.

Research implications: A novel case-conceptual critical analysis furnishes new insights into how existing NGO accountability systems can be improved with technology. Despite the growing excitement about the possibilities of blockchain and triple-entry accounting systems, this paper offers a critical reflection on the limitations of these technologies and suggests avenues for future research.

Practical implications: Examples of how blockchain and triple-entry accounting systems can be integrated into NGO systems are presented. This research also raises the importance of creating a strong nexus between humans and technology, which ensures that ‘socialising’ forms of accountability that empower vulnerable stakeholders, are embedded into international aid.

Originality/value: This research provides insight into present challenges with NGO accountability, using empirical evidence, furnishing potential solutions using novel blockchain and triple-entry accounting systems. Greater accountability to partner organisations and beneficiaries is important, as it potentially enables NGOs to learn how to be more impactful. Therefore, this paper introduces rich, contextually embedded perspectives on how NGO managers can exploit such technologies to enhance accountability and impact.

Introduction

Non-governmental organisations (NGOs) are facing increasing scrutiny over their accountability. An overarching concern is that NGOs are susceptible to vested interests who can shape accountability and accounting practices within NGOs (Boomsma & O'Dwyer, 2019; Kuruppu & Lodhia, 2020; Goddard, 2020). This has reinforced the idea that NGOs favour 'upward' accountability (for example, to donors) at the expense of 'horizontal' and 'downward' accountability to partner organisations and beneficiaries (see, for example, O'Dwyer & Unerman, 2008). This imbalance of power has meant that NGOs have suffered from 'mission drift' (see, for example, Cordery et al., 2019 p. 12), and struggle with improving accountability and trust with a wider range of stakeholders (Goddard & Assad, 2006; Agyemang, O'Dwyer, Unerman, & Awumbila, 2017). Current systems of discharging accountability are complex, expensive and narrow in focus (see, for Ebrahim, 2003; Agyemang et al., 2009). As Cazenave and Morales (2021) argue, there is also increasing pressure to 'corporatise' and make NGOs 'more auditable' to respond to upward accountability demands from institutional donors.

Concerningly, this means that diverse views from partner organisations and beneficiaries may not be considered, stifling opportunities to learn how to enhance an NGO's impact[1]. The challenges of managing diverse NGO stakeholders are also well documented (see, for example, Edwards & Hulme, 1996; O'Dwyer & Boomsma, 2015). In relation to horizontal accountability, NGOs have to be clear about their contribution when working with partner NGOs who may be allies on some projects and competitors for external funding for others (Agyemang, O'Dwyer, & Unerman, 2019 p. 2361). For example, perceptions of what constitutes legitimate accounting and accountability practice is driven by power differences between 'rich' and 'Northern' (developed country NGOs) and their 'Southern' (developing country) counterparts (Goddard, 2020). Thus, NGOs may actually produce negative outcomes by imposing inappropriate and/or 'Western' ideas on developing nations (see for example, Jayasinghe & Wickramasinghe, 2011). However, little work exists on how to improve horizontal accountability in NGO settings.

[1] O'Leary (2017) provides an example of how learning and growth can be enhanced with stronger downward accountability practices.

Limited research exists on beneficiary or downward accountability which explores how actors that are powerful, such as NGOs, engage with and discharge accountability to aid beneficiaries (vulnerable/marginalised people or communities) (some notable exceptions are, O'Leary, 2017; Dewi, Manochin, & Belal, 2019; Tanima, Brown, & Dillard, 2020; Kingston, Furneaux, de Zwaan & Alderman, 2020; Scobie, Lee & Smyth, 2020; Tanima, Brown, Wright & Mackie, 2021). Judgements about the effectiveness of NGOs need to incorporate beneficiary perceptions (Andreaus & Costa, 2014 p. 159) and move beyond a singular focus on financial efficiency, to understand the wider social impact (see, for example, Epstein & McFarlan, 2011). Engaging with all stakeholders closely, and with empathy, is important to ensure that reporting and accountability practices are meaningful, informative, and consistent with an organisation's mission and identity (see, for example, Costa, Pesci, Andreaus, & Taufer, 2019; Scobie, Lee, & Smyth, 2020).

Digital disruption, especially from blockchain technology, has the ability to fundamentally reform existing accountability structures in organisations (Dai & Vasarhelyi, 2017; Yermack, 2017). Blockchain technology may reduce the burden of external auditing on organisations, and create the potential for triple-entry accounting, which can revolutionise record-keeping and reporting systems (Dai & Vasarhelyi, 2017; Cai, 2019). These new technologies can produce novel ways of increasing transparency, auditability and openness in the way that people, organisations and systems interact. Blockchain and triple-entry systems could also reduce the administrative burden of manually compiling, verifying and reporting information, which will alter how performance measurement and reporting is conducted across organisational boundaries. This may liberate resources and create space for vulnerable stakeholders, such as beneficiaries, to be more engaged in aid projects which affect their own lives (see, for example, Scobie et al., 2020). Ultimately, technology may provide a platform to integrate feedback, and engage with less powerful stakeholders to enhance the learning from and amplify the positive outcomes of aid interventions (see, for example, O'Leary, 2017).

Further work is required on how NGOs are presently engaging with, and can better demonstrate accountability through 'new forms and avenues of accounting' (Parker, 2011 p. 18). However, while important, much of the current research on blockchain and triple-entry accounting systems are theoretically-driven reviews applied to broader business settings (see, for example, Dai & Vasarhelyi, 2017; Bonsón & Bednárová, 2019). Research also needs to concurrently examine

NGO accountability issues from donors, to administering organisations, such as other NGOs, through to beneficiaries (Hall & O'Dwyer, 2017). There are also three fundamental archetypes of NGOs—development, policy-advocacy, and hybrid NGOs (Kuruppu & Lodhia, 2019, p. 3)—and each have different aims, needs and structures, which also alter the nature of accountability relationships (see, for example, Brown & Moore, 2001; Murtaza, 2012; Cordery et al., 2019). Grappling with these complexities will help to clarify issues in advancing NGO accountability, and therefore, how to improve NGOs' impact (see, for example, Costa et al., 2011; Andreaus & Costa, 2014; Gray et al., 2014).

Consequently, this paper examines the potential of technology to reshape accounting and accountability practice, and offers several contributions to the literature. We outline specific mechanisms to improve NGO accountability through blockchain technology and triple-entry accounting systems across different upward, downward and horizontal stakeholder relationships. To do this, we deploy a novel combination of case study and conceptual methods, capitalising on some of the best aspects of each. First, we outline existing issues in NGO practice using an empirical case study. We use this as a foundation to develop conceptual solutions that show how blockchain and triple-entry accounting technologies may resolve these accountability issues. While conceptual, this type of approach has been encouraged because of the dearth of empirical information on blockchain (and triple-entry accounting) (Carlin, 2019; Pimentel & Boulianne, 2020). As such, this study contributes to a more operational understanding of accountability through different NGO project scenarios, furnishing grounded insights into the impact that these technologies can have on NGO accountability practice. We also critically reflect on the possibilities and limitations of these technologies.

The research question of this study is:

How can blockchain technology and triple-entry accounting systems transform NGO accountability, and what are the limitations of these technologies in doing so?

The paper is structured as follows. First, we introduce key theoretical perspectives on accountability, followed by a discussion on NGO accountability and processes. Then, we explore blockchain and triple-entry accounting systems. Subsequently, the method of the study is explained along with the empirical findings of existing NGO accountability and reporting systems.

Using this context, we propose possible blockchain and triple-entry accounting solutions which are then critiqued using theoretical perspectives on accountability. Finally, we conclude with the possibilities and limitations of new technology and implications for future research.

Perspectives on accountability

Accountability is an ever-evolving, chameleon-like concept which adapts to different contexts (see, for example, Sinclair, 1995; Crofts & Bisman, 2010). Recent research on NGO accountability has found that there are 113 conceptualisations of accountability, all used inconsistently (Kaba, 2021). As the intent of this paper is exploratory and illustrative, we have chosen two broad strands of accountability to frame the findings and discussion. The first strand is used to operationalise various processes of accountability (see, for example, Bovens, 2010; Brandsma & Schillemans, 2012). The second, more critical strand of the accountability literature, is used to reflect on issues of power, equity, and inclusion (see, for example, Dillard & Vinnari, 2019).

Accountability as a process

Accountability is broadly understood to involve a relationship(s) between two or more entities through a giving and receiving of accounts for intentions/activities/performance within a particular social and moral context (Gray et al., 2014). This definition means that accountability is directional (e.g., 'to whom' an organisation/entity is accountable), so its nature (e.g., the 'how' and 'for what' of accountability) also needs to be considered (Murtaza, 2012; Andreaus & Costa, 2014; Kaba, 2021 p. 16).

Bovens (2010) uses a simple categorisation to explain two forms of accountability: accountability as a virtue ('for what' an organisation is accountable) and accountability as a mechanism ('how' an organisation is/becomes accountable). Accountability as a virtue considers when an organisation articulates, or adheres to, a set of substantive standards by which its performance can be evaluated (Bovens, 2010; see also, Manetti, 2014). Accountability as a mechanism considers how the organisation and forums interact. Bovens (2010, p. 951-952) defines a forum as an individual or institution who can oblige an 'actor' to give an account, deliberate and question the actor and account given, and finally, pass judgment on the actor.

Similarly, Brandsma and Schillemans (2012, p. 955) summarise three stages in the process of accountability: 1) the information phase, where the 'actor' provides an account of their conduct to the 'forum', 2) the discussion phase, where the 'audience' evaluates and deliberates the performance of the actor, and 3) the consequences phase, where the actor is rewarded, punished, or corrected.

Critical perspectives on accountability

From a more critical perspective, Roberts (2009) outlines how organisations seek to achieve 'transparency' as a benchmark. Transparency involves making that which is opaque and hidden from view, visible and open. Roberts (2009) concludes that "…accountability is the condition of becoming a subject who might be able to give an account" (Roberts, 2009 p. 959). As such, the idea of power is inherently intertwined with the idea of accountability (Roberts, 2009 p. 959). Similarly, Messner (2009) questions the infallibility and morality of accountability because the burden of external demands for an account may 'invade' or 'colonise' practice. So much so that "…constant concern with accountability ultimately dominates concern with the underlying practice", and diverse, and potentially conflicting social norms or 'truths' are difficult to trade off (Messner, 2009 p. 933).

When conflicting accountabilities arise, it is often easier to define accountability and the stakeholders to whom one is accountable in a narrow way (Messner, 2009 p. 934). Kamuf (2007, p. 253) argues against blindly adopting 'calculatively dominated accountability', and others call for more socialising and empathetic forms of accountability (Gibbon, 2012; McKernan, 2012). Furthermore, McKernan and McPhail (2012, p. 178) explain that because accountability is often viewed as a target-setting exercise, accountability actually undermines responsibility by allowing a ceaseless process of 're-specification' of the accounts that need to be discharged. Dillard and Vinnari (2019, p. 19) suggest that this has resulted in an 'accounting-based accountability' which is typified by a "…uni-directional, accounting driven process…" rooted in "…its traditional role of recording and disclosing (reporting) economic transactions of an entity using the traditional double entry system".

This accounting-based view of accountability is particularly harmful for stakeholders who are vulnerable and do not have the power to hold others to account or effectively engage in deliberative

processes (see, for example, Dillard & Vinnari, 2019; Tanima et al., 2020). O'Leary (2017) outlines how power imbalances between stakeholders need to be acknowledged to create more transformative processes for engaging with NGO beneficiaries (see also, Dillard & Vinnari, 2019, p. 22; Kingston, Furneaux, de Zwaan & Alderman, 2020). More directly, Tregidga and Milne (2020, p. 16) find that without the perception that stakeholders in an accountability relationship are legitimate and respected "… some identities will be delegitimised, potentially bullied and intimidated, even brutalised, and thus desist from and even fear future engagements". This raises concern over the inclusion of beneficiaries in aid processes (Tanima et al., 2021).

NGO accountability

Directions of accountability

There are numerous perspectives and frameworks for analysing NGO accountability (see, for example, Costa et al., 2014; Andreaus & Costa, 2014; Pianezzi, 2021). In this paper, we explore how NGO accountability can be divided into upward, downward and horizontal accountability (see, for example, Edwards and Hulme, 1996 p. 967; Murtaza, 2012 p. 114). Costa, Parker, and Andreaus (2014) note that there is a 'dual accountability challenge', where NGOs must maintain financial viability and achieve a social (or environmental) mission. However, there is a tendency to favour 'hierarchical' accountability which satisfies a narrow band of salient stakeholders (Cordery et al., 2019; Cazenave & Morales, 2021). It is this emphasis on financial and economic relationships that distances stakeholders, necessitating more formalised accountability and control systems (Gray et al., 2014). International NGOs (INGOs) tend to oversee local organisations at a distance, and are reluctant to relinquish any sort of control to local partners (see, O'Dwyer & Unerman, 2010 p. 462-464; Goddard, 2020). Nonetheless, Uddin and Belal (2019) outline how upward accountability can also promote downward accountability if beneficiaries are emphasised within reporting and monitoring processes.

Complicating matters, various types of NGOs exist, each serving different purposes and functions in society, which may lead to very different accountability concerns (see, for example, Murtaza, 2012; Kuruppu & Lodhia, 2019). Brown and Moore (2001) discuss the nature of accountability and strategy that an INGO may face if operating as a service delivery, capacity building or policy-advocacy organisation. Different stakeholder concerns become more salient depending on the type

of activities in which the NGO is engaged (Brown and Moore, 2001 p. 579). Thus, Kaba (2021, p. 21) argues that greater attention needs to be given to the relationships between different types of NGOs and conceptualisations of accountability.

Existing NGO accountability and reporting systems

Agyemang, Awumbila, Unerman and O'Dwyer (2009) found that the effects of upward accountability systems could be counterproductive because donors tended to fund a narrow range of project ideas, technologies and impact groups, potentially limiting the long-run effectiveness and relevance of aid (see also, O'Dwyer and Unerman, 2008). NGOs have focused too much on short-term functional accountabilities rather than the long-term strategic perspectives necessary to create sustainable social and political positive transformations (Ebrahim, 2003, p. 813; see also, Avina, 1993). Accountability in this sector should stretch beyond financial and economic considerations, and value the ability of an organisation to achieve its intended mission (Andreas & Costa, 2014). Similarly, Murtaza (2012, p. 112) suggests that accountability should consider the rights of all stakeholders to be in "…all phases and levels of the performance management cycle of an entity". Therefore, it is essential to open up NGOs to greater scrutiny, and reduce the inherent power structures embedded in social and political relationships (Ebrahim, 2003 p. 819).

Processes of accountability need to be used together in more sophisticated ways to enable this (see also, Costa, Ramus, & Andreaus, 2011). Presently, NGOs use five common accountability mechanisms, including external reporting[2], performance assessments and evaluations, participatory decision-making, self-regulation and social auditing (Ebrahim, 2003; see also, Agyemang et al., 2009 p. 13). However, embedding downward and horizontal accountability systems, such as participatory decision-making, is problematic (Agyemang et al., 2009; Hall & O'Dwyer, 2017) because beneficiaries are reluctant to critically evaluate projects for fear of losing future benefits. The creation of safe spaces for dialogue is important for genuine and more inclusive beneficiary engagement (see, for example, Tanima et al., 2021). This shows why personal interactions are crucial in improving upward and downward accountability (Mawdsley, Townsend, & Porter, 2005, p. 78-79).

[2] Includes annual reports which are mainly external documents to a range of stakeholders and interim reports which are generally specific to donors.

Using a novel conceptualisation of empathy, Costa et al. (2019 p. 249) note how external reporting/disclosures are shaped by both legitimacy and accountability perspectives. From an accountability perspective, Benjamin (2008) argues that not for profit organisations may be driven to provide two types of accounts. Verification accounts are provided to legitimise the organisation's activities for the commitments and responsibilities that are placed on them. Explanatory accounts are provided when verification accounts fail to satisfy stakeholder concerns, such as why performance was not as expected. Explanatory accounts are used to change expectations of the account demanders by showing that initial objectives were too constraining or ineffective (Benjamin, 2008 p. 212). Arguing for a more holistic accountability framework, Andreaus and Costa (2014) propose that non-profit disclosure needs to involve: 1) economic/financial capability and sustainability, 2) how the mission of the organisation is being achieved, and 3) the impact of the organisation's activities on stakeholders (see also, Moore, 2000; Bagnoli & Megali, 2011; Epstein & McFarlan, 2011).

Multiple accountabilities may lead to 'over-accounting' (to diverse stakeholders) and 'under-accounting' (to avoid scrutiny). Moreover, Schmitz, Raggo and Vijfeijken (2012) argue that overly rigorous reporting requirements may create a culture of silence by reducing the likelihood of NGOs reporting failed cases for fear of being penalised by donors (see also, Rahmani, 2012). Similarly, reporting and performance assessment/evaluation tends to focus on physical outputs because donors largely ignore narrative information (Reith, 2010, p. 452). The dominant use of regimented performance measurement systems such as the Logical Framework (also known as Log Frame) measure outputs, impacts and capacity. They have been accused of diluting NGO values because intangible social goals are being compromised in order to attain tangible and quantifiable performance measures (Hailey, 2000, p. 404). Recent evidence also shows how NGOs respond to the 'burden of evaluation' by proactively preparing themselves to be 'auditable' (Cazenave & Morales, 2021). The preoccupation with systems geared towards upward accountability has ultimately excluded the voices of vulnerable stakeholders because of the lack of accountability/governance mechanisms designed to empower them (O'Dwyer, 2005 p. 291). Costa et al.'s (2019) work is important in this regard, showing how stakeholder salience impacts genuine dialogue and deliberative processes, and the ways that organisations are accountable to others.

The present study will explore how accountability to different stakeholders can be discharged, and may potentially change, via the emerging technologies introduced in the next section.

Blockchain and triple-entry accounting technology

Blockchain technologies are a form of distributed ledger technology which "…makes the exchange of value possible by registering and transferring it in a tamper-proof way" (Bonsón & Bednárová, 2019, p. 725). The fundamental purpose of these technologies is to decentralise the control of information and thereby solve the problem of gaining and maintaining trust in interactions (for example, in purchasing transactions between unknown parties) (Pimentel & Boulianne, 2020). For simplicity, the following explanation will refer to transactions between entities; however, blockchain technologies can be applied to a variety of issues, for instance, in recording share transfers on registries or verifying educational qualifications.

In a blockchain, a peer-to-peer network is used to produce and store transactions in a long chain of chronologically organised blocks (Schmitz & Leoni, 2019). Each peer (or node) in the network stores the exact same verified record of all transactions to date. A block consists of many transactions that are batched together[3] and time-stamped for processing. Time-stamping also ensures that transactions in a block cannot be altered later. Blockchain systems introduce specialised cryptography (mathematical hash functions) as another layer in the data recording and verification process. Each block and its timestamp are cryptographically sealed (with a hash function) onto the end of an existing chain of blocks (which are themselves cryptographically sealed), thus ensuring that records are immutable. Attempts to alter recorded information on a blockchain would immediately cause the mathematics which seals all transactions in the blockchain to disagree. For fraudulent or malicious transactions to be inputted after a block has been added would mean altering all prior records to date on all nodes in the peer-to-peer network—an almost impossible task (Fanning & Centers, 2016).

There are two broad types of blockchain: permissioned (private) and permissionless (public) (Helliar, Crawford, Rocca, Teodori, & Veneziani, 2020). Permissionless chains are the most

[3] Merkle Trees are used to structured data, by hashing together all transactions, reducing a massive amount of data into a set of characters of fixed length (Bonsón & Bednárová, 2019 p. 727). Altering even a single digit in one of the transactions combined into a Merkle Tree would significantly alter the hash output of the block of transactions making diagnosis of errors incredibly efficient.

known due to the popularity of cryptocurrencies like BitCoin. These permissionless chains essentially enable anyone to join the peer-to-peer network and transact with others. A set of public and private keys is used in the mathematical hashing process to anonymise (to a certain extent) the identity of individual transactors. This system of keys creates a unique hash function of a particular transaction between two or more parties. This transaction is added to a public broadcast of a new transaction block. With some public chains such as BitCoin, a process of 'mining' these new blocks is another important step in verifying/auditing and recording data.

Permissioned chains offer an alternative system that seems to sit more comfortably with traditional businesses and government agencies (Helliar et al., 2020). Permissioned chains restrict the sharing of information to authorised parties, such as auditors (Helliar et al., 2020). Triple-entry accounting systems are made possible via permissioned chains, and allow the instantaneous tracking of transactions and real-time, continuous auditing in a secure manner (Dai & Vasarhelyi, 2017; Yermack, 2017). Triple-entry accounting automatically reconciles an organisation's standard double-entry bookkeeping simultaneously with a 'third ledger' on a blockchain. The focus of this paper is on permissioned chains which use less resource-intensive verification processes.

Dai and Vasarhelyi (2017, p. 11) lay out a system for triple-entry accounting that integrates a company's existing Enterprise Resource Planning (ERP) system with a blockchain using a system of blockchain tokens. Effectively, this means that organisations retain their traditional double-entry accounting, but also incorporate an interlocking set of blockchain accounts that independently enable transactions to be recorded, verified and audited continuously. Cai (2019) offers a simplified triple-entry accounting system based on Grigg's (2005) original conceptualisation. In Cai's (2019) system, a single digital entry in each entity's accounting system is sufficient if it is reconciled in a third ledger on a blockchain. This steps away from Dai and Vasarhelyi's (2017) model for triple-entry accounting, suggesting that a public third ledger is a necessary interlocking cog between entities, rather than using blockchain as an extension of existing ERP systems (Cai, 2019 p. 12). The challenge is that organisations may be reluctant to shift away from the status quo and adopt accounting systems which rely heavily on an external system to reconcile transactions.

A system of smart contracts adds to the sophistication of such a triple-entry system (Cai, 2019). These contracts are a "…digital contract whose terms are agreed by two parties and programmed into a blockchain. Once they are programmed into a blockchain, neither party can manipulate these

terms due to the immutable feature of blockchain" (Cai, 2019 p. 8). Parties to a contract can activate the logic and create an outcome (Rozario & Vasarhelyi, 2018). For instance, smart contracts can automatically execute an agreed payment to a vendor when services have been rendered. Using smart contracts can increase efficiency and transparency of auditing and reporting processes (Rozario & Vasarhelyi, 2018). In combination, these technologies lower the costs of record keeping and reporting, and improve the timeliness, transparency and quality of financial information disclosed (Carlin, 2019 p. 308).

Some have argued that the usefulness of blockchains for reporting purposes are still limited because of the possibility for private/permissioned chains to be altered and the limited speed of transaction processing (Coyne & McMickle, 2017). However, technology is rapidly evolving and solving some of these issues (Cai, 2019; Helliar et al., 2020).

Method

Empirical information on blockchain applications in industry is limited because implementation is still nascent (Pimentel & Boulianne, 2020). Therefore, Pimentel and Boulianne (2020, p. 352) advocate for creative approaches to generate theory. Similarly, Carlin (2019, p. 309) argues that the dearth of empirical information on blockchain limits the scope of present methodologies and calls for approaches which derive "…normative prepositions for practice and regulation". In response, we introduce a two-stage 'case-conceptual' method: 1) to understand existing issues in NGO accountability using empirical case-based data, and 2), based on the identified issues and limitations of current practice, develop conceptual blockchain and triple-entry accounting solutions to mitigate these accountability issues. This approach furnishes grounded conceptual solutions, which illuminate possibilities for advancing social accounting beyond the current status quo (Parker, 2011; Dillard & Vinnari, 2019; O'Leary & Smith, 2020).

For stage 1, we conducted a qualitative case study of a Sri Lankan affiliate of an INGO, referred to by the pseudonym *DENAVĀ*[4]. This enabled us to understand the organisation within the context of its operating environment, and explore processes and employee perceptions using a variety of

[4] Denavā broadly means to give in the Sinhala language. Any resemblance of this pseudonym, or any others used in this paper, to an actual NGO, other organisation or initiative is unintended.

different information sources (Yin, 2009; Bernard & Ryan, 2009). We gained empirical evidence on *DENAVĀ*'s practices from deep, engaged and longitudinal fieldwork. Over the period of the study, *DENAVĀ* underwent a significant organisational transformation, downsizing and moving away from development-based activities to policy-advocacy initiatives.

Three data collection methods were deployed during the primary data collection phase, undertaken over approximately 6 months during 2013, namely semi-structured interviews, document analysis and non-participant observation. Ongoing engagements with the *DENAVĀ* over subsequent years, most recently from a research project conducted during 2019–2021, have showcased how accountability systems, and the problems identified in this paper, have remained largely unchanged.

The primary data for this study consisted of 21 interviews conducted with executives (9), senior management (8) and project/operational level employees (4). Repeat interviews with the same person (mainly the Managing Director) ensured a solid understanding of the NGO's context, strategy and processes. Further, 20 relevant documents were also reviewed, including final performance assessments and evaluations for projects, impact measurement documentation (including Logical Framework material), available documentation on accountability processes and a donor agreement, and NGO partnership documentation. The content of these documents provided an understanding of official organisational narratives of what is said, to whom and how (Babbie, 2010, p. 324). The primary researcher was also a non-participant observer at a meeting held between the NGO's staff and a local partner in a gender equity project. As a 'complete observer', the researcher did not influence the phenomena being observed (Flick, 2006, p. 217). These different data collection strategies provided a rich understanding of the context (Marshall & Rossman, 2011; see also, for example, Pianezzi, 2021).

Data interpretation broadly followed the process flow outlined by O'Dwyer (2004, p. 394). Interview recordings and notes of interviews/observations were reviewed several times. This then led to data reduction via coding in NVIVO using an intuitive and open coding scheme (O'Dwyer, 2004) based on prior literature (Creswell, 2009). This enabled the significant amount of data collected to be segregated, and relationships between labels to be identified via mind maps and 'big picture' storylines (O'Dwyer, 2004; Grbich, 2007). Several re-readings of themes then

allowed a rich description to be written, illustrating quotes and examples (O'Dwyer, 2004; Gibson & Brown, 2009). Given the research objective of this paper, the empirical findings from this study are mainly illustrative of existing accountability and reporting regimes.

Desk research and a critical analysis was conducted for stage 2, which involved an extensive review of current blockchain and triple-entry accounting in the accounting literature. Trends, challenges and the latest use cases/architectures were examined to provide a current state of play of these technologies. These issues were then mapped over the empirical insights drawn from the *DENAVĀ* case study which highlighted problems and limitations with current accountability processes. The lead researcher was also immersed in other projects being operated by *DENAVĀ*. This provided a grounded insight into constructing a structure for blockchain and triple-entry systems based on conceptual solutions to the identified accountability issues. We propose this is a novel 'case-conceptual' method.

Present accountability and reporting processes

The next sections will outline *DENAVĀ*'s upward, downward and horizontal accountability processes as they relate to key stakeholders. Discussion will explore issues of to whom, how and for what organisations are accountable (see, for example, Costa et al., 2011; Brandsma & Schillemans, 2012; Andreaus & Costa, 2014; Gray et al., 2014; Kaba, 2021).

Upward accountability processes: *Donors*

The organisation's accountability and reporting systems are mainly geared towards upward stakeholders: "We are doing a very good job in accountability to our donors and also to *DENAVĀ* Global[5]" (Program Advisor). Upward accountability acknowledges that resource providers have a right to an account of how funding is used (Boomsma and O'Dwyer, 2019; Kuruppu and Lodhia, 2020), and that donor funding is crucial to an NGO's long-term survival and sustainability (Moore, 2000; Andreaus & Costa, 2014).

[5] The Global Head Office which *DENAVĀ* also reports to.

Performance assessments and evaluations (see, for example, Agyemang et al., 2009) through mid-term reviews were conducted halfway through each project to gauge initial successes and issues with project implementation. Final end-of-project performance assessments and evaluations were usually detailed and in-depth. These reports were typically conducted by external consultants. Performance assessments and evaluations were usually based on a Logical Framework, which takes the overarching goals and context of a project, and then deconstructs these into problems and objectives (*DENAVĀ Logical Framework Training PowerPoint Slides*) (see also, for example, Agyemang et al., 2009; Ebrahim, 2003). Logical Frameworks define the key requirements that the project must meet, how to achieve those tasks, by whom and when.

Donors received extensive disclosure statements and reports (see, for example, Agyemang et al., 2009) which were usually based on pre-agreed template formats (Region Director 1). Each donor agreement prescribed the reporting requirements that were expected (*DENAVĀ Sri Lanka Donor Agreement with Large Donor*). Typical items accounted for included 'burn rates' to represent how quickly funds for certain item codes were being spent. Some donors, such as the European Union, were stricter than other funding agencies and had precise stipulations on the checks and balances that were necessary before money could be spent; some agreements asked for multiple quotes for each purchase item to verify procurements over Sri Lankan Rs. 50,000 (less than $500 USD). Consequently, reporting was mainly prescribed, rigid and focused on 'verification' (Benjamin, 2008) of economic activities.

Donors also wanted impact/performance assessments and evaluations which satisfied their "craving for examples of our projects […] that's what they want from us…They're doing all the theory and they are expecting our NGO to tell them whether it's working or not" (*DENAVĀ* Global Governance Advisor; also discussed by Project Manager 1). Ultimately, as the respondent continues, this is because "[d]onors, they want the number. Everybody's craving for how many millions they've reached…", although "…impact discourse is a joke…It's quite dry…You comply… tick, tick, tick the box…" (*DENAVĀ* Global Governance Advisor; see also, Hailey, 2000). This resonates with Reith's (2010) conclusion that physical outputs tend to be emphasised, and donors ignore narrative disclosures (see also, O'Dwyer & Unerman, 2008). However, these performance assessments and evaluations, which were primarily conducted by external

consultants, were intended to be more open-ended, and typically required qualitative and quantitative approaches to data collection and analysis.

The rigour of *DENAVĀ*'s reporting systems meant that donors were willing to invest in the organisation's projects, especially because "[s]ome of the local NGOs don't have enough of the checks and balances and, you know, the reporting and things like that. They're not standard" (HR Director 1st Interview). Cazenave and Morales (2021) show how displaying strong accountability systems to donors are a source of pride and competitive advantage to the NGO. It granted *DENAVĀ* credibility with donors and helped to secure its financial viability over the long term (see, for example, Moore, 2000; Andreaus & Costa, 2014). The vast amount of data the NGO collected also served to reinforce 'accountability to themselves' (Najam, 1996), ensuring the organisation was acting ethically and achieving its organisational vision and mission. Nonetheless, to further enhance how accountability was operationalised to other stakeholders, new systems would need to be developed to build on "…common sensitivities, not to raise expectations, not to conceal information" (Project Director 2 and Project Manager 2). Using new technology could conceivably help with transparency, especially of quantitative information.

Upward accountability processes: *Government*

The Sri Lankan Government was an important stakeholder because of its power to censor and monitor the NGO's activities (Murtaza, 2012). The government's relationship with INGOs in Sri Lanka was particularly complex because of a lack of trust and suspicion over activities that were seen to undermine national independence (see, for example, Goonatilake, 2006; Kuruppu et al., 2020). As one staff member commented, "[w]e have to work with the system. You know, don't just ignore that and implement it… So if we really want to change it [community impact], I think we have to closely work with them [the government]" because "…they are like a little suspicious about you and your organisation…" (Project Manager 1).

The importance of partnerships with government agencies elevated with a shift to policy-advocacy-based projects. The activities that *DENAVĀ* coordinated with government services were diverse, ranging from serving on technical advisory committees developing gender sensitive emergency responses, to helping to set up a 'women's issues' desk at various police stations to deal with complaints of gender-based violence. Working with the government was crucial to

successfully achieving *DENAVĀ*'s mission; initially in gaining legitimacy and credibility to function, and then in accessing remote or conflict affected areas where government agencies were coordinating development projects.

Through the Sri Lankan NGO Secretariat, the government also mandated quarterly reports of all activities and funds undertaken by NGOs over the period to assess if conflicts of interest, wastage and fraud were taking place (Region Director 1). This coincided with a clear shift in *DENAVĀ*'s monitoring and evaluation policy, because the reduction in its staff numbers and capacity required, "…as far as possible, [that] impact indicators should be linked to those which are monitored by other development partners, particularly the Government of Sri Lanka" (*DENAVĀ Impact Measurement Framework*). In relation to gender, this may relate to gender equity measures the government was tracking related to the UN Millennium/Sustainable Development Goals.

The consistent issue with *DENAVĀ*'s engagement with the government sector was that coordination and alignment depended on individual relationships between NGO employees and state employees. If state employees were transferred, it could significantly undermine *DENAVĀ*'s planned activities as personal relationships would need to be rebuilt. Thus, despite the documented results, ultimately whether *DENAVĀ* was considered a legitimate actor would depend on potentially transient employees. It is worth noting, therefore, that even with a blockchain solution, human and socialised and/or political factors which affect the legitimacy of NGOs cannot be ignored.

Downward accountability processes: *Beneficiaries*

Reporting to beneficiaries was minimal and mainly limited to informal forums or focus group discussions regarding projects. This is despite Brown and Moore's (2001) suggestion that 'capacity building' and 'policy influence' INGOs were (or should be) especially accountable to clients or target groups. Downward accountability systems were still not operating "across the board" and at times were simply an "exercise that you go through... rather than really holding any real accountability" (Director of Programs). *DENAVĀ* did not feel compelled to disclose information or provide reports to beneficiaries, which became a self-reinforcing cycle. This was especially because there was "no real mechanism within the organisation to hold those managers, those programmes accountable" (Director of Programs). Similarly, another employee noted that "we

don't have a mechanism, kind of a strong mechanism in writing you know communicating with them, so that's one area… Because like to say of donors we have to submit monthly report – quarterly report like that, but for the [other] stakeholders I don't think we have to have kind of a pressure – they are not demanding us to you know produce this kind of reports …" (Program Advisor). Anonymous complaints mechanisms were set up for *DENAVĀ* projects to receive feedback, e.g., phone tip-off lines[6]. However, overall, limitations with such systems suggest a breakdown of the 'information' and the 'discussion' phase of accountability (Brandsma & Schillemans, 2012).

Insights about the success or failures of the project from a beneficiary perspective were primarily relayed through annual project reports, mid-term or end-of-project reviews which were filed with donors. One project annual report noted that "…it was identified that some participants of the sessions had effectively used what they had learned to improve their situation at home…[and]… had helped the husband and wife resolve some of their differences…" (*Gender Equity Project Annual Report*). This provides useful context of potential project impact, but the scale of the effect amongst participants and potential 'negative' consequences on some groups is harder to identify. While the depth of reporting is fundamentally tied to limited resourcing, there is an element of self-interest in ensuring that donor views of the project are positive so that funding continues (Moore, 2000). Nonetheless, it must be noted that *DENAVĀ*'s innovation was acknowledged with external awards for the *Gender Equity Project*.

Mid-term and final project assessments deployed more sophisticated data collection/analysis methods such as qualitative interviews, surveys, focus group discussions and field observations. An end-of-project report for a governance project highlighted how "[t]he evaluation was largely participatory and [*DENAVĀ*] team members were involved in the discussions and in the design of the evaluation tools and guidelines" (Governance Project Final Evaluation Report). Therefore, beneficiary views, through annual project reports and performance assessments and evaluations, were filtered to some degree by *DENAVĀ* employees (see, for example, O'Dwyer, 2005; Murtaza, 2012). While using *DENAVĀ* staff knowledge provides insight into the context of a project's

[6] This was important to potentially capture wider community feedback but could not be targeted to specific project beneficiaries to solve/verify issues such as the 'last-mile' problem discussed later.

impact, it also introduces the possibility that project beneficiaries considered 'atypical', for instance, may be excluded from participating in the data collection process.

Beneficiary selection was also a crucial part of downward accountability and ensuring the success of individual projects (*Beneficiary Selection and Compliance Mechanism Documentation*) as the organisation tended to work within "…[v]ery small margins. So we work with the poorest. So the poorer households will want to know, how come we were not selected?" (Director of Programs). Creating a rational and transparent process for beneficiary selection was important because *DENAVĀ* had to constantly justify the decisions it made (Project Manager 1). Some projects engaged very strongly with the community in the beneficiary selection process, establishing a wealth ranking exercise for beneficiary selection that was based on a community-led assessment, together with establishing a complaints review committee (*Beneficiary Selection and Compliance Mechanism Documentation*). As discussed later, beneficiary selection and management could be facilitated using blockchain technology.

Horizontal accountability processes: *Partner NGOs*

Horizontal accountability emphasises mutual equality in relationships and is key in ensuring that capacity building NGOs (which part of *DENAVĀ*'s activities fit within) are accountable to the partners/clients they work with (Brown & Moore, 2001). Partnerships were categorised according to alignment and value-added, ranging from 'sub-contracting relationships', to 'careful considerations', to 'highly successful partnerships' (*DENAVĀ Partnership Review Documentation*). The *DENAVĀ Partnership Principles* specifically outline that the nature of interactions with partners determines the quality of any partnership where, "[t]he best partnerships involve mutual accountability, which means devising mechanisms to ensure that both of the partners' constituencies (not just donors) are satisfied by the results of the partnership". Nonetheless, power dynamics affected the degree to which *DENAVĀ*'s staff were willing to engage in genuine deliberation with local NGOs (see, for example, Costa et al., 2019; Goddard, 2020). Part of the anxiety that *DENAVĀ* staff faced was outlined in a *DENAVĀ Partnership Principles* document itself, where a significant barrier to effective partnership is "…fear of being held accountable for the mistakes of others, or conversely not receiving recognition for success" (see,

for example, Unerman & O'Dwyer, 2010), especially as *DENAVĀ* was concerned with presenting a credible face to its donors (see, for example, Schmitz et al., 2012).

While *DENAVĀ* itself was governed by strict operating manuals (e.g., *DENAVĀ Sub-Agreement Policy Manual*), the integrity of these processes depended strongly on the individual staff member and line manager (Region Director 1). A Subcontractor Management Policy dictated the terms by which *DENAVĀ* offices would engage with subcontractors to use donor funding (*DENAVĀ Subcontractor Policy Manual*). Sub-agreements were designed to be consistent with the *DENAVĀ* Partnership Principles' and were monitored by a specialised 'Donor Compliance Division' of *DENAVĀ*'s Global Office. Some of the terms of these contracts could be encoded as smart contracts to a blockchain which would then enable multiple parties to monitor progress towards aid outcomes in real-time.

Adopting a similar attitude to donors, *DENAVĀ* would often require monthly progress to be filed by partner NGOs (*Gender Equity Project Researcher Notes*). For partner NGOs to receive further funding, complete reports needed to be filed on time using Logical Frameworks and other reporting forms. Templates were used, wherever possible, to provide a consistent reporting format from period to period. However, the sheer size and scale of some of *DENAVĀ*'s projects meant that "it's a huge process that you're about to embark on and the thing is, I know with data, it's like you have stacks and piles [of data]" (Project Advisor – Impact Measurement). So with some partner NGOs, there were many issues with incomplete and "meaningless" reports (*Gender Equity Project Researcher Notes*), which for example, reported that partner NGO staff 'attended a community development forum meeting', but no details were provided as to what was said, who attended and relevant outcomes for the project. Accountability mechanisms did not empower partner NGOs to hold *DENAVĀ* accountable (see, for example, Murtaza, 2012 p. 122).

These reporting processes necessitated a large investment in data collection and analytical capacity. While some aspects of performance measurement were resisted (see, for example, O'Dwyer & Unerman, 2008), these systems also satisfied 'internal' demands for accountability from within the NGO itself, and helped to determine the projects that the NGO should invest in further. For instance, statistics such as the number of men that participated in a particular gender equity forum were necessary to understand success in engaging men in discussions of gender-based violence (Project Advisor – Impact Measurement). Rahmani (2012 p. 300) discussed how

excessive donor requirements could cause wastage, and *DENAVĀ* was also cognisant that their processes placed a burden on partner NGOs "…you also need some investments in terms of systems, procedures, financial audits and so on and so forth. It's a huge burden for the local NGOs" (HR Director 2nd Interview). *DENAVĀ* staff also found it challenging to determine which parts of the vast data available were necessary and useful for specific stakeholders, potentially leading to issues of over accounting (Edwards & Hulme, 1996 p. 967).

Synthesis of present accountability issues

In relation to the 'to whom' question of accountability, the preceding *DENAVĀ* case study highlighted the predominantly upward nature of accounting and accountability processes (see, for example, Agyemang et al., 2017; Boomsma and O'Dwyer, 2019; Kuruppu and Lodhia, 2020). Therefore, in terms of the 'how' of accountability, existing accounting and reporting systems were predominantly hierarchical and formal in nature. This was especially clear in the performance assessments and evaluations that were conducted based on the Logical Framework model, which was targeted towards demonstrating impact to donors (see, Cazenave & Morales, 2021).

The Sri Lankan Government was a powerful stakeholder who could censure aid activities and required regular reporting through the NGO Secretariat. Stronger, more transparent and less burdensome reporting could enable NGOs to operate more freely in emerging economies like Sri Lanka, where the state is inherently cautious about foreign NGOs (see, for example, Goonatilake, 2006). This could also give the NGO greater credibility when receiving donor funding (Costa et al., 2011; Andreaus & Costa, 2014). These reporting requirements could be discharged via blockchain and triple-entry accounting systems, allowing for real-time monitoring and feedback. By freeing up time from intensive accounting and audit procedures, these technologies may create opportunities for greater deliberative dialogue (Kingston et al., 2020) between various stakeholders. This could move NGOs away from functional accountabilities which focus on issues like resource use, to more strategic concerns related to the impact of NGO activities (Avina, 1993), and reflecting on what the NGO is/is not and should be in the future (O'Leary & Smith, 2020; Pianezzi, 2021).

DENAVĀ consider themselves innovators at the forefront of international aid and development processes. However, downward accountability processes were more embryonic in nature,

particular in relation to creating formal systems where beneficiaries could hold *DENAVĀ* accountable for actions (Agyemang et al., 2009; Agyemang et al., 2017). Beneficiary selection processes were tightly defined, as this was a high-risk area that could lose the NGO credibility if there was real or perceived favouritism involved. *DENAVĀ* was also engaging in 'participatory development' projects which upskilled and encouraged beneficiaries to take leadership of processes in relation to shaping attitudes around gender equity and violence (O'Leary, 2017). While this enhanced the beneficiaries' ability to engage with aid projects, accounting processes still required activities to be documented in a way that performance and results could be documented for donors (Cazenave & Morales, 2021). Other aspects of engagement with beneficiaries primarily occurred during focus group discussions and surveys that were undertaken as part of performance assessments and evaluations. However, the hierarchies and power imbalances between stakeholders in these situations may have impeded beneficiary engagement (Tanima et al., 2021).

The 'what' of NGO accountability is an important question to answer, but one that fundamentally depends on the nature of an organisation's activities (see, for example, Manetti, 2014). In the case of *DENAVĀ*, as a hybrid NGO (Kuruppu & Lodhia, 2019) it had a very broad mandate (see, also, Brown & Moore, 2001). The organisation's social impact goals were determined through needs assessments with communities, through evaluation of Sri Lanka's development requirements and government plans, and through engagement with *DENAVĀ*'s international headquarters which had oversight of country level operations across the world. While a specific discussion of these processes is outside the scope of this paper, it is important to note that many project parameters were driven by donor demands (see, Boomsma & O'Dwyer, 2019) or government requirements (Murtaza, 2012). The needs of beneficiary groups were mainly assessed via experts (such as external consultants) rather than beneficiaries themselves (see, for example, O'Dwyer & Unerman, 2008; Agyemang et al., 2009). At an extreme, this shows how certain voices may be excluded and de-legitimised from participation (Tregidga & Milne, 2020).

Construction of a proposed system

The following discussion draws from the earlier discussion of existing accountability systems at *DENAVĀ*. As advocated by Carlin (2019) and Pimentel and Boulianne (2020), we present a

'generative' discussion, outlining future possibilities for using blockchain and triple-entry accounting technologies to address existing issues. The construction of a fully functioning blockchain and triple-entry solution is a complex task. We outline the broad elements of how such a system could work, involving the key stakeholder groups identified in the prior literature and through the empirical NGO case study. This exercise responds to Costa et al.'s (2011, p. 475) encouragement for NGO/non-profit organisations to develop more sophisticated accountability systems that are able to reconcile diverse stakeholder needs. As the focus will be on explaining the potential use of these technologies in an accessible manner, we present a number of conceptual NGO case examples. Importantly, in responding to prior research (Brown & Moore, 2001; Murtaza, 2012; Cordery et al., 2019; Kuruppu et al., 2019), these various examples illustrate how the nature of NGO activities (development or policy-advocacy) reveal different implications for how technology can shape accountability.

One hypothetical institutional donor is considered in this simplified setting: *DonorOne*. *DonorOne* resources various aid programs in the South Asian region and will administer the permissioned blockchain. This is because institutional donors are likely to have the greatest resource base and vested interest in administering blockchain infrastructure to track and trace the impact of their aid funding. Similarly, *DENAVĀ*, the INGO outlined in this research, will be used as an example of a hybrid NGO which primarily conducts development-based activities but is rapidly expanding into the policy-advocacy space.

Two hypothetical projects are described to maintain the anonymity[7] of the case NGO. The first project (*Inclusive Education*) relates to an education project for girls which provides uniforms to increase the attendance and engagement of girls in schools. The *Inclusive Education* project is implemented in conjunction with a hypothetical local partner NGO (*Catalyst-4-Girls*) which is responsible for distributing uniforms to remote regions where *DENAVĀ* does not have an operational base. The second project relates to a gender empowerment project (*Empowering Women*), which aims at increasing the level of women's decision-making in household budget decisions. The *Empowering Women* project is implemented with two hypothetical local partner NGOs: *Partnership for Equality* and *Enhance Equity*. *Partnership for Equality* provides services

[7] *DENAVĀ* had unique project interventions and was considered at the cutting edge of certain development initiatives in Sri Lanka. Therefore, to retain the case NGOs anonymity, we build examples of projects which are inspired by *DENAVĀ*'s work, but not necessarily directly related to it.

which enable women to access financial services such as banking. *Enhance Equity* runs training sessions in villages for both women and men on gender equity and equal decision-making in household budgeting.

Example 1 – Inclusive Education

A permissioned blockchain would allow *DonorOne* to easily monitor where *DENAVĀ* spends funds on the *Inclusive Education* project. Transactions can be recorded on *DonorOne* and *DENAVĀ* accounting (or ERP) systems as per current double-entry accounting practice, with these transactions then automatically and securely reconciled on the permissioned chain using triple-entry accounting, following Dai and Vasarhelyi's (2017)[8] token-based blockchain methodology (see Figure 1). Block A refers to previously batched transactions which are then linked to, for example, a $1m transfer from *DonorOne* to *DENAVĀ* in Transaction B. *DENAVĀ* may be allowed to use 20% of this funding ($200,000) on its own administration costs, checked with smart contracts. Of the $800,000 left, let us assume that *DENAVĀ* uses 40% ($320,000) to purchase and distribute girls' uniforms to villages. The rest ($480,000) is transferred to *Catalyst-4-Girls*. Again, *Catalyst-4-Girls* can retain 20% of this funding ($96,000) for administration purposes, with the rest ($384,000) restricted to purchasing girls' uniforms and other eligible items from suppliers (Transaction D).

[8] While Cai (2019) proposes a more interlocking form of triple-entry accounting, we use Dai and Vasarhelyi's (2017) conceptualisation where two independent sets of accounts are kept which are then reconciled automatically with a third ledger - as this design is likely to be easier to adopt and integrate into existing organisational systems.

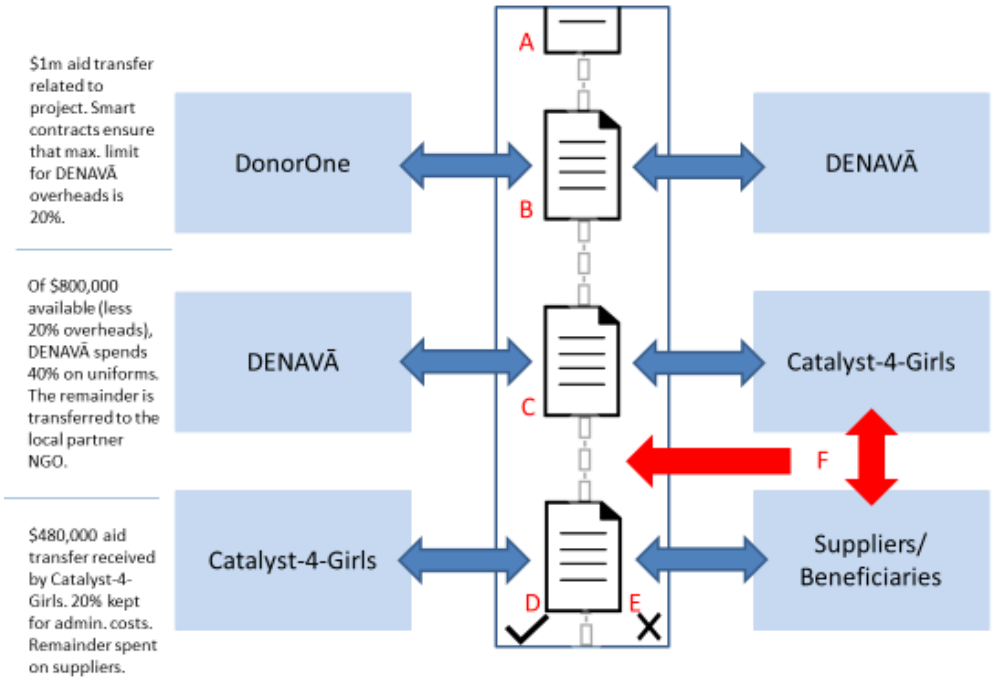


Figure 1: Possible blockchain and triple-entry accounting system

In a permissioned blockchain system proposed by Dai and Vasarhelyi (2017), each entity would keep their own books but reconcile these transactions on a blockchain which would allow instant verifiability of transactions. Dai and Vasarhelyi's (2017) system uses blockchain tokens (obligations) that would be used in creating 'triple-entries' on the blockchain that match the double-entries used in each entity's accounts, and which ultimately represent resource flows between entities (e.g., purchases) (see also Bonsón & Bednárová, 2019, p. 433/434). In this sense, Benjamin's (2008) 'verification' type accounts could be automated. A blockchain can segregate the funding received for a particular aid project. If *DENAVĀ* or *Catalyst-4-Girls* attempt to spend money on other project items (common practice in some NGOs), such as a water pump for a separate drought relief project (Transaction E), then the blockchain can automatically deny or flag these transactions for review by *DonorOne*. *DonorOne* could ask for 'explanatory' accounts (Benjamin, 2008) which would then enable *DENAVĀ* or *Catalyst-4-Girls* to justify why they needed to carry out Transaction E. If deemed reasonable, smart contract rules could then be adjusted such that future transactions of a similar nature could be accommodated. This level of 'autonomous' decision-making is a unique feature of blockchain technology and smart contracts, which encode rules such that aid funds are only disbursed after specific targets are achieved.

Such a system could greatly reduce *DENAVĀ*'s administrative burden of conducting performance assessments and evaluations and reporting impacts/outcomes to donors. For example, additional funds (staggered funding) may be automatically disbursed to *DENAVĀ* when a project milestone, such as a mid-term performance assessment and evaluation, has been verified by *DonorOne*. Mid-term performance assessments and evaluations would still need to be conducted by people (e.g., Transaction F), allowing a necessary human touchpoint to ensure that accountability does not become completely machine-driven, simplistic and narrow (see, for example, O'Dwyer & Unerman, 2008). Human intervention is necessary to understand nuances in the aid context that cannot be pre-programmed into a set of rules on smart contracts. This understanding can also highlight new or unforeseen issues where smart contracts could be detrimental or need further refinement.

Beneficiary selection could also be coded into blockchains via smart contracts. Each beneficiary could have their own profile set up and verified on the blockchain. Eligibility criteria would be checked automatically for certain projects; for instance, if beneficiaries were above a certain income threshold, they could be eligible to access a financial planning scheme, while ineligible to receive free school uniforms. This could streamline processes, so long as there was still careful review in the encoding and management of such smart contract logics. Importantly, this would increase the sophistication of downward accountability systems (Costa et al., 2011).

Blockchain technology also enables anonymous 'voting' rights to be granted to beneficiaries. This can empower aid project beneficiaries to almost[9] anonymously report negative incidents, such as the purchase of poor-quality uniforms that were not fit for purpose, e.g., Transaction F. For instance, *DENAVĀ* itself may have used a high-quality supplier to purchase school uniforms. However, there may be instances where the local partner NGO, *Catalyst-4-Girls*, directs funding to other projects by purchasing cheap school clothing to be distributed to remote villages. Conducting comprehensive, manual external audits of school uniforms would be resource-intensive for both *DENAVĀ* and *DonorOne*. However, through anonymous voting systems, beneficiaries in these remote villages could signal a quality issue with uniforms. This would then trigger *DENAVĀ* and/or *DonorOne* to audit the specific sites with the most complaints. This targets areas which require the most attention and ensures a greater recognition of beneficiaries' voices.

[9] There may be barriers to guaranteeing complete anonymity when setting up beneficiary profiles, etc.

High level data, which maintains the privacy of beneficiaries/partners, can also be shared via the blockchain to improve transparency and trust with government services in Sri Lanka (see, for example, Christ & Helliar, 2021; de Villiers, Kuruppu & Dissanayake, 2021). This type of multi-directional and multi-stakeholder system is vital to improving accountability and broadening conceptions of NGO performance (see, for example, Bagnoli & Megali, 2011; Costa et al., 2014, p. 12).

Example 2 – Empowering Women

The main issue with the described systems is that permissioned blockchains will largely suit development-based NGOs where the tracking and tracing of impact is more specific and measurable (e.g., the case of tracing the purchase of school uniforms or microfinance schemes). However, many NGOs are having to reconstruct themselves to be hybrid NGOs or completely focused on policy-advocacy initiatives (Kuruppu and Lodhia, 2019). For such organisations, blockchain systems would have to be designed to have significantly more human intervention, especially when it comes to certifying activities (see, for example, Helliar et al., 2020) and ensuring project outcomes are achieved. This may ultimately reduce the opportunities and efficiencies that blockchain provides for policy-advocacy NGOs.

For example, with the *Empowering Women* project, *DENAVĀ* and *DonorOne* can potentially track and verify the costs of activities with participants. For instance, the costs for a trip where *Partnership for Equality* takes women by bus to open their own bank accounts can only be entered as a transaction on the blockchain once the activity is verified by beneficiaries. While the villagers who attended the trip will not be able to verify the specific costs involved (nor do they need to), they can still verify that the trip at least occurred. This can assure *DENAVĀ* and *DonorOne* that appropriate activities are taking place. The number of new bank accounts created can also potentially be verified, e.g., by bank staff, creating multiple contact points for transaction assurance. Up to now, the project scenario is similar to the flows of transactions and obligations in the triple-entry accounting system described in Figure 1.

Another example from the *Empowering Women* project is that the time spent by partner NGO staff (*Enhance Equity*) providing financial wellbeing training modules could be verified. *Enhance Equity*, for instance, can be monitored in terms of the number of hours that the group spends with certain villagers (almost akin to the concept of billable hours). For instance, a ‘transaction’ may

be recorded on the permissioned block chain for this specific project noting that *Enhance Equity* has spent five hours on financial training with 'Rani', 'Jeevani' and 'Helen'. These villagers can verify the amount of time spent with certain partner NGO staff via the permissioned chain and, once confirmed, *DENAVĀ* can then transfer funds to *Enhance Equity* via smart contracts. This enables the NGO to better understand resource requirements and efficiency considerations. Blockchain and triple-entry can further enhance how accounting and reporting is integrated into accountability systems, by creating space for stakeholders to explore *why* certain trends or issues are arising, rather than be fixated with verifying *what* has happened and *when* (O'Leary & Smith, 2020). Ultimately, this could strengthen management control and refine an NGO's strategic direction.

However, these examples highlight the 'last-mile' issue with blockchain[10] and triple-entry accounting verification. The last-mile problem arises when service providers, such as the bus company used by *Partnership for Equality* in the above example, may be reluctant or unable to use blockchain technology (Transaction E) because it presently uses manual and/or physical record keeping[11]. This means that the auto-reconciliation provided when suppliers integrate into a blockchain is not possible without further manual steps (see, for example, Helliar et al., 2020). Still, there is some assurance from beneficiaries that activities have occurred which at least enable other auditing processes to be more targeted in their focus.

The last-mile issue becomes even more problematic in pure policy-advocacy initiatives such as the gender equity and household budgeting training that *Enhance Equity* offers to villagers. The objective of these training sessions is to change engrained cultural norms and values about the role of gender in decision-making. Information on the number of hours of training provided, and by which staff to which villagers can be recorded and reported via blockchain and triple-entry accounting systems. However, the extent to which these activities are creating an impact in community *perceptions* and the *decision-making* of beneficiaries is missed. Thus, separate human-led impact studies and auditing processes are also needed because changes in behaviour take a long time to embed and are typically not quantifiable. Importantly, some NGOs cannot disclose

[10] Organisations and initiatives, such as AidChain (https://www.aidchain.co) and BitGive (https://www.givetrack.org), are developing platforms to improve aid transparency and tracking using blockchain technology and solve the last-mile issue.
[11] For smaller companies or suppliers operating in developing countries, systems are likely to be paper-based and manual.

that they are trying to change specific behaviours as it affects impact evaluation methodology using quasi-experimental designs (see, for example, Kuruppu and Lodhia, 2020). Therefore, transactions such as Transaction F may need to be done 'off-chain' and reconciled by humans (e.g., external consultants/auditors) with existing milestones.

As important stakeholders, government agencies (such as the NGO Secretariat in Sri Lanka) can be given special 'view only' access to specific information on the blockchain. This may include relevant information on project impact, such as the number of villagers reached and the costs of these programs. This can focus stakeholders on deliberative discussions that enhance accountability (see, for example, Dillard & Vinnari, 2019), and also signal areas where further government support/welfare programs are required. Prior literature has acknowledged the significant divide between the global South (developing) and the North (developed) countries (Goddard, 2020). Providing access to this information can also then strengthen the bilateral and multilateral ties between the governance structures of developing nations and their foreign counterparts. It may also go some way towards reducing some of the distrust that is inherent in the system, or the fears that aid initiatives from foreign actors are new forms of colonisation or soft power (see, for example, Goonatilake, 2006; Jayasinghe & Wickramasinghe, 2011).

Discussion

The upward focus of NGO accountability processes is unlikely to shift even with new technology. This is not necessarily detrimental if upward accountability systems are designed in a way that enhances beneficiary accountability (see, Uddin & Belal, 2019). Technology may create new possibilities for less powerful horizontal and downward stakeholders to play a more engaged role in aid development processes, and also enable them to hold upward stakeholders to account. This improves present downward accountability problems, where power differentials, inequity and exclusion prevent meaningful beneficiary engagement (see, for example, Kingston et al., 2020; Tanima et al., 2021). If implemented mindfully, technological innovation can de-emphasise how powerful stakeholders are privileged via "…formal, vertical, and 'rational' ways to demonstrate accountability…", and accommodate a perspective "…based on the fact that every stakeholder has the right to accountability from any organisation that has an impact on them" (Costa et al., 2019 p. 250).

Figure 2 shows how blockchain solutions move beyond current linear, manual and centralised accountability systems to a decentralised structure which opens up greater possibilities for engagement between various stakeholders. This follows calls from Murtaza (2012, p. 123) to reconsider current NGO accountability practices to enable greater justice in society (see also, Dillard & Vinnari, 2019). Drawing from O'Leary and Smith's (2020, p. 16) work, using technology to conduct impact measurement and reporting may also "…provide an alternative starting point for discussion in which 'something' could be generated from a space of possibilities…", moving organisations beyond their fixation with past impact, to conceiving future aspirations for what could be. This encourages NGOs to reflect on their internal accountability, and their alignment with their ethical and strategic mission (see, for example, Ebrahim, 2003).

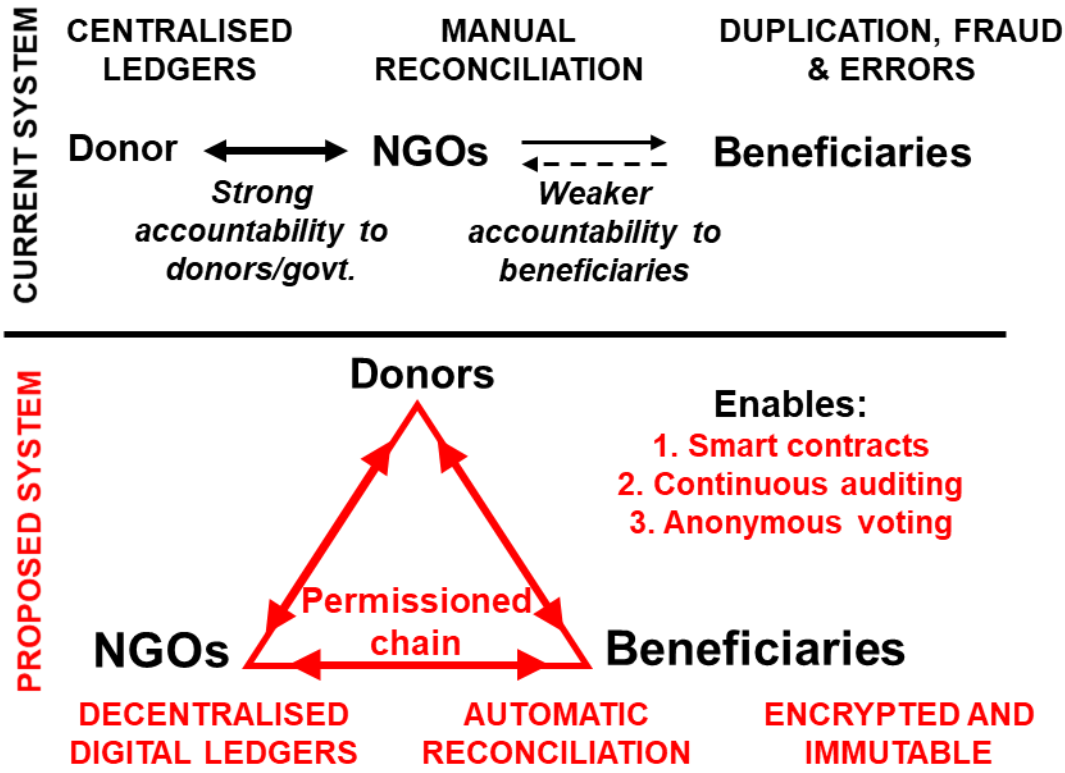


Figure 2: Current and proposed system

Accountability as a process

Blockchain and triple-entry accounting technologies primarily affect account giving and receiving through automation. Such processes are 'explanatory' and information generating (Benjamin,

2008; Brandsma & Schillemans, 2012; Dhanani & Connelly, 2015). These are ideally placed objectives for blockchain and triple-entry accounting given their real-time data processing, reconciliation and reporting capabilities. Auditing of accounts will be transformed into a process based on coding and the verification of systems, rather than the minutia/invoice tracking/reconciliation that sometimes concerns present auditing regimes. Similarly, the capabilities for beneficiaries to provide anonymous feedback would also improve the 'discussion' and 'consequences' stages of accountability (Brandsma & Schillemans, 2012). As a result, explanations would be more tailored to address differences in perspective about performance, leading to multi-directional, and more nuanced conversations about the ideals/virtues to which NGOs should aspire (Bovens, 2010).

While using technology to create a foundation for more engaged conversations around accountability would be ideal, it may also cause NGOs to focus more on 'excuse-making' and image management (see, for example, Brandsma & Schillemans, 2012). This may have positive externalities, focusing NGO staff on *justifying* the value added nature of their activities rather than dedicating significant resources, as in the present systems, to simply *recording and reporting* activities. However, it raises concern around whether, for example, policy-advocacy organisations will be too preoccupied with a 'ceaseless re-specification' (McKernan & McPhail, 2012) of how their expenses look rather than how they can better achieve policy goals. In this sense, it will be important to define 'what' NGOs are held accountable for with regard to, for example, performance according to quality standards, perceived external effectiveness, and efficiency compared to other NGOs (see, Manetti, 2014; Andreaus & Costa, 2014). With the automation offered by the blockchain, NGOs and stakeholders may have less time (or potentially more time) to plan and react. They may find themselves constantly providing information, deliberating on performance, and continuously facing the consequences of the various transactions/activities that take place (Bovens, 2010; Brandsma & Schillemans, 2012). This may be exacerbated by rules-based decision-making backed by smart contracts, which enable faster consequences if pre-programmed conditions are met.

It will be crucially important to ensure that NGOs focus on strategic priorities rather than myopically managing financial and upward accountability (see, for example, Costa et al., 2011). Regulatory and authoritative guidance need to be carefully constructed so that appropriate

incentives and institutional architectures (Brandsma and Schillemans, 2012) are created for people and organisations to engage with these new technologies. Emphasis will need to be placed on Brandsma and Schillemans' (2012) discussion of providing information, and creating the conditions for vigorous and stakeholder engaged debate about that information. Less emphasis should be placed on the rewards and punishment elements of their accountability (Brandsma & Schillemans, 2012), especially in the early phases of technology adoption. This is because such overt pressure may reduce acceptance and create conditions of fear and stress for NGO employees, which are detrimental to NGO activities. Instead, the focus should be on creating the conditions for socially desirable and aspirational actions to improve accountability from NGOs themselves (Dubnick & Frederickson, 2010; Andreaus & Costa, 2014). Taking a proactive approach can simultaneously improve NGO performance and credibility in the eyes of donors, governments, beneficiaries and other stakeholders (Murtaza, 2012, p. 122; Schmitz et al., 2012). For instance, national governments may be interested in using blockchain technology to understand the collective programmatic impact of a group of organisations working in a particular area like gender equality, and how this impact then feeds into achieving national/international targets such as the United Nations Sustainable Development Goals [UN SDGs] (see, for example, de Villiers, Kuruppu & Dissanayake, 2020).

Critical perspectives on accountability

Dillard and Vinnari (2019) argue that present systems of accounting and accountability need to be fundamentally reconfigured if they are to enable pluralism and democratic governance. This needs more than incrementalism (Dillard & Vinnari, 2019 p. 22), requiring a deeper reflection on what organisations are held accountable for, as well as to whom and how.

As discussed in the examples earlier, blockchain and triple-entry accounting systems can crystallise the rigid and regimented types of accountability systems that presently exist (e.g., donor reporting and government activity disclosure), by automating the way that NGOs satisfy donor cravings for impact with numbers and facts, or verification accounts (Benjamin, 2008; see also, O'Dwyer & Unerman, 2008). This could potentially entrench 'calculative practices', quantification and create distance between powerful stakeholders (e.g., donors) and weaker ones (e.g., beneficiaries) (see, for example, Kamuf, 2007). It could also mean that technologies like blockchain may introduce punitive forms of account-giving and receiving; for example, where

funds provided to NGOs may be held as ransom by smart contracts if donor requirements are not fulfilled.

As explained earlier, if unchecked, a sense of continuous auditing may distract or completely trap NGOs into over-accounting their activities (see, for example, Edwards and Hulme, 1996; Schmitz et al., 2012; Roberts, 2009 p. 958; Messner, 2009 p. 933). Implementing blockchain systems could lead to the radical transparency of NGO activities, which may subject NGO workers to higher levels of scrutiny and a lack of freedom to experiment (see, for example, Messner, 2009; Schmitz et al., 2012). Accountability may then become an exercise that is "…typically self absorbed and driven by the narcissistic imperative to garner praise/reward to the self or absolve the self of blame, rather than by the collective need to manage organisational interdependencies" (Roberts, 2009 p. 958).

New technology will also alter traditional norms, rules and behaviours about NGO performance, reporting and accountability (see, for example, Edwards & Hulme, 1996; Ebrahim, 2003; Murtaza, 2012). Qualified personnel will need to be hired or trained to manage blockchain processes. This may distort organisational narratives and behaviours, causing people in mission-driven organisations like NGOs to become conflicted or confused about their purpose (Pianezzi, 2021). These issues may be exacerbated for NGOs working in the policy-advocacy space that focus on changing attitudes and behaviours. More broadly, this tension may reverse the trend towards undertaking policy-advocacy activities back to development-based and direct implementation activities which are easier to quantify and measure (Kuruppu & Lodhia, 2019).

Therefore, the transformations of accountability that are possible with blockchain and triple-entry accounting systems are also fraught with the possibility of de-humanising accountability between people, processes and organisations. This is important to avoid, as lower level basic empathy drives organisations to seek legitimacy via their reporting and accountability practices (Costa et al., 2019). Higher order 're-enactive' empathy, on the other hand, encourages higher-quality and more consistent reporting behaviours (Costa et al., 2019). Higher order empathy can only be achieved through stronger engagement with stakeholders, which in turn brings organisations closer to their missions and identities (Costa et al., 2019; Costa et al., 2011).

If enacted with closeness and higher-order empathy (Costa et al., 2019), and with accountability considered as a 'gift' (McKernan, 2012), these technologies could also humanise existing NGO accountability practices, creating greater space for explanatory accounts (Benjamin, 2008). This can open the space for greater and more inclusive deliberation of NGO performance (Brandsma & Schillemans, 2012). Using new technology may also encourage maintaining a 'proper distance' to guard against overexposure of vulnerable groups (Frey-Heger & Barrett, 2021). In this way, technology could significantly improve accountability by ensuring that stakeholders in aid delivery can focus resources on value-added activities, or invest in socialising forms of accountability (O'Leary, 2017; Tanima et al., 2020). Ultimately, this could enable more reflective internal accountability processes and stronger strategic decision-making within NGOs (Andreaus & Costa, 2014; O'Leary & Smith, 2020). NGOs may also be encouraged to reflect on all stakeholders, their diverse 'truths' (Messner, 2009) and engage with potentially contested views (Dillard and Vinnari, 2019; Kingston et al., 2020). Illuminating these diverse perspectives will create an environment in which accountability moderates power differentials between stakeholders and improves equity and inclusion of the most vulnerable in society (Roberts, 2009; Dewi et al., 2019).

Another important issue is whether poorer and marginalised groups such as *DENAVĀ*'s beneficiaries will have the capacity, including literacy, or resources to engage with technology. If not, using technology may further disempower and exclude voices from aid processes that are intended to empower and include. However, mobile phone use is ubiquitous in countries such as Sri Lanka, and recent research from Christ and Helliar (2021) relating to blockchain use with other vulnerable stakeholders shows how apps could be developed so that audio/verbal records are used.

Conclusion

This paper proposes a way to address NGO accountability, which is under increasing scrutiny, with the aid of blockchain and triple-entry accounting technologies. Smart contracts and anonymised voting rights within blockchains (Yermack, 2017) offer possibilities for innovating the way that NGOs account for and develop aid projects. Combined with triple-entry accounting (Dai and Vasarhelyi, 2017; Cai, 2019), these technologies can improve NGO accountability by increasing efficiency, accuracy and the auditability of record-keeping, performance measurement and external reporting. While such innovation exposes NGOs to greater corporatisation and

auditability (Cazenave & Morales, 2021), it could also enable a deeper reflection on organisational impact and identity (O'Leary & Smith, 2020 p. 16; Pianezzi, 2021). Considering the 'invisibilities' (O'Leary & Smith, 2020, p. 16) and limitations of blockchain and triple-entry accounting systems can also transform traditional accounting(s) (see, for example, Parker, 2011; Dillard & Vinnari, 2019), and generate space for greater democratic engagement in aid processes (Kingston et al., 2020; Tanima et al., 2020; see also, Tregidga & Milne, 2020). Changing organisational structures and processes also creates new opportunities for accountability logics to change (Kuruppu & Lodhia, 2019a). In these ways, NGOs can demonstrate their value creation vis-à-vis their intended missions, garner support from donors, and free up resources to innovate and ensure organisational survival (Moore, 2000).

This study makes a number of contributions to the literature. First, it maps potential pathways for how blockchain and triple-entry accounting can transform existing organisational practices (see, for example, Dai and Vasarhelyi, 2017; Cai, 2019; Bonsón & Bednárová, 2019). This is a contribution to practice because many existing NGOs have limited capacity and resources to assess the potential and limitations of technology. Prior literature has shown how upward accountability dominates present NGO accountability systems (see, for example, Agyemang et al., 2017; Boomsma and O'Dwyer, 2019). Focusing on less powerful stakeholders improves buy-in and is likely to increase the social and economic impact of aid interventions (O'Leary, 2017). This research explains how, through blockchain and triple-entry accounting, upward accountability systems, record-keeping and auditing can be automated. Automation reduces the burden of verification accounting (Benjamin, 2008), intensive record-keeping and reporting practices which consume significant organisational resources (see, for example, Edwards & Hulme, 1996; Ebrahim, 2003; Agyemang et al., 2009; Dhanani & Connelly, 2015). A key challenge raised by the existing NGO accountability literature can be addressed—how to better engage with downward and horizontal forms of accountability, without ignoring the pressure for strong upward accountability (see, for example, Goddard & Assad, 2006; Agyemang et al., 2017; Uddin & Belal, 2019).

Second, this research shows how technology can help shape what accountability is and should be in everyday practice by enabling vulnerable/marginalised groups to participate in dialogic processes (see, for example, Kingston et al., 2020). Accommodating more empathetic (Costa et

al., 2019) and 'socialising' accountability practices (see, for example, Roberts, 2009; Gibbon, 2012; McKernan, 2012) reduces the power differentials beneficiaries face when interacting with more powerful stakeholders, and improves the agency of vulnerable groups in processes which affect their lives (Agyemang et al., 2017; O'Leary, 2017). Greater equity and inclusion of diverse stakeholder voices can also enable NGOs to generate new perspectives and ways for beneficiaries to address structural barriers that impact their welfare (see, for example, Frey-Heger & Barrett, 2021). For instance, more time and resources could be channelled towards more inclusive accountability practices, such as participatory and dialogic engagement with beneficiaries (Tanima et al., 2020). Ultimately, this will encourage greater pluralism and democracy, fundamentally altering accounting and accountability systems by integrating diverse and potentially contested views (Dillard & Vinnari, 2019).

Third, where Kuruppu and Lodhia (2019) and Cordery et al. (2019) have called for more research into how different types of NGOs engage with accountability and stakeholders in diverse ways. This paper contributes to the discussion with contextualised examples, illustrating how different types of NGOs can integrate blockchain and triple-entry accounting into measuring, managing and reporting performance to external stakeholders (see, for example, Carlin, 2019; Pimentel & Boulianne, 2020). For instance, as demonstrated in our analysis, some types of NGOs, such as policy-advocacy NGOs, may struggle to use the blockchain to document their activities and impact, which may create tensions in defining their organisational identities (Pianezzi, 2021) and detract from achieving their missions (Costa et al., 2011). However, deliberative discussion with multiple stakeholders around the adoption of new technology may also spark stronger, more innovative approaches to measure and report on the performance of policy-advocacy initiatives (such as how to better document the reach of a particular gender equity project). As such, this paper presents a more operationalised understanding of how technology can influence multiple dimensions of accountability in different NGOs (Hall & O'Dwyer, 2017), and is a platform of analysis from which future studies can extend.

A further contribution of this study is its critical examination of the possibilities and limitations of new technologies in solving accounting and accountability issues. Prior literature, while salient, has primarily discussed the benefits and potential of adopting blockchain technology (see, for example, Dai and Vasarhelyi, 2017). However, we show through a more critical lens that adopting

new technology to improve NGO accountability is unlikely to be a panacea. This paper identifies the limitations of new technology, such as creating tendencies for over-accounting and over-transparency, which were previously identified as potential issues in theoretical contexts (Roberts, 2009; Messner, 2009). It also raises concerns about reinforcing calculative practices and hierarchical accountability through these technologies (Kamuf, 2007). There are also technological limitations to blockchain and triple-entry accounting systems related to scalability, energy consumption, complexity and security (see, for example, Schmitz & Leoni, 2019; Bonsón & Bednárová, 2019). However, the technical literature (e.g., computing) continues to advance new solutions to overcome these challenges (see, for example, Helliar et al., 2020). Therefore, the accounting profession (see, for example, Bonsón & Bednárová, 2019; Cai, 2019; Carlin, 2019; Schmitz & Leoni, 2019; Pimentel & Boulianne, 2020) and practitioners working in sophisticated multi-stakeholder systems (see, for example, Christ & Helliar, 2021; de Villiers et al., 2021) such as international aid should be encouraged to engage with the development of these technologies.

Our unique method can also be regarded as a contribution to the literature. We demonstrate how it is possible to proceed in a more practical fashion when real-life examples of the use of specific technologies and forms of accounting are not available to study. Instead of following a purely conceptual approach (see, for example, Dai & Vasarhelyi, 2017; Bonsón & Bednárová, 2019), we ground our conceptual solution development in the specific practical problems experienced by a real NGO, without following an action research methodology. Our approach draws on some of the best aspects of a case study and a conceptual study, and could, therefore, be called a case-conceptual method.

There is a need for further empirical work and/or creative research approaches (Carlin, 2019; Pimentel & Boulianne, 2020) to explore the potential of these technologies to address accounting and accountability problems. Multi-disciplinary perspectives are necessary to develop pathways for new accountings which better engage with complex stakeholder systems like international aid. First, more empirical work is needed on how blockchains with triple-entry accounting can be used to increase accuracy and integrity, while reducing monitoring and auditing costs between donors and NGOs, and between NGOs and beneficiaries. This would address the significant challenge of how to make international aid more accountable, and would have significant applications in other contexts where data capture and disclosure is complex, such as efforts for corporations and

governments to collectively measure and report on the progress of the UN SDGs. Second, new insights are needed on how, if at all, these technologies can encourage new, stronger forms of horizontal and downward accountability, and amplify the social and economic outcomes of aid. Governance and controls over these technologies also need to be considered. Third, the ways that these technologies may incentivise certain institutional/organisational forms (e.g., development-based organisations over policy-advocacy) needs further exploration and critique. Blockchains could also make organisational borders more porous and transform an NGO's identity in unexpected ways. Thus, further research is required on how blockchain and triple-entry accounting may impact the attribution of performance in complex systems. Finally, richer insights are needed on the unique tools these technologies enable, such as anonymous voting rights, and whether vulnerable groups have the capacity/resources to engage with such tools. Ultimately, this could empower vulnerable and marginalised people to engage with technological advances that can benefit their own social, political and economic lives and improve the long-term impact of aid and NGOs.

References

Agyemang, G., Awumbila, M., Unerman, J., & O'Dwyer, B. (2009). *NGO Accountability and Aid Delivery*. Retrieved from Association of Chartered Certified Accountants website: https://research-repository.st-andrews.ac.uk/handle/10023/3795

Agyemang, G., O'Dwyer, B., & Unerman, J. (2019). NGO accountability: retrospective and prospective academic contributions. *Accounting, Auditing and Accountability Journal*, Vol. 32 No. 8, pp. 2353-2366. https://doi.org/10.1108/AAAJ-06-2018-3507

Agyemang, G., O'Dwyer, B., Unerman, J., & Awumbila, M. (2017). Seeking "conversations for accountability." *Accounting, Auditing & Accountability Journal*, *30*(5), 982–1007. https://doi.org/10.1108/AAAJ-02-2015-1969

Andreaus, M., & Costa, E. (2014). Toward an integrated accountability model for nonprofit organizations. Accountability and Social Accounting for Social and Non-Profit Organizations (*Advances in Public Interest Accounting)*, Emerald Group Publishing Limited, Bingley, *17*, pp. 153–176. https://doi.org/10.1108/S1041-706020140000017006

Avina, J. (1993). The evolutionary life cycles of non-governmental development organizations. *Public Administration and Development*, *13*(5), 453–474. https://doi.org/10.1002/pad.4230130502

Babbie, E. R. (2010). *The Practice of Social Research.* (12th ed.), Cengage Learning, Wadsworth. https://doi.org/10.2307/2062956

Bagnoli, L., & Megali, C. (2011). Measuring Performance in Social Enterprises. *Nonprofit and Voluntary Sector Quarterly*, *40*(1), 149–165. https://doi.org/10.1177/0899764009351111

Benjamin, L. M. (2008). Account Space: How Accountability Requirements Shape Nonprofit Practice. *Nonprofit and Voluntary Sector Quarterly*, *37*(2), 201–223. https://doi.org/10.1177/0899764007301288

Bernard, H. R., & Ryan, G. W. (2010). *Analyzing Qualitative Data: Systematic Approaches*. Thousand Oaks, California: SAGE.

Bonsón, E., & Bednárová, M. (2019). Blockchain and its implications for accounting and auditing. *Meditari Accountancy Research*, *27*(5), 725–740. https://doi.org/10.1108/MEDAR-11-2018-0406

Boomsma, R., & O'Dwyer, B. (2019). Constituting the governable NGO: The correlation between conduct and counter-conduct in the evolution of funder-NGO accountability

relations. *Accounting, Organizations and Society, 72*, 1–20. https://doi.org/10.1016/j.aos.2018.05.012

Bovens, M. (2010), "Two Concepts of Accountability: Accountability as a Virtue and as a Mechanism", *West European Politics*, Vol. 33 No. 5, pp. 946-967, doi: 10.1080/01402382.2010.486119.

Brandsma, G. J., & Schillemans, T. (2012). The Accountability Cube: Measuring Accountability. *Journal of Public Administration Research and Theory*, *23*(4), 953–975. https://doi.org/10.1093/jopart/mus034

Brown, L. D., & Moore, M. H. (2001). Accountability, Strategy, and International Nongovernmental Organizations. *Nonprofit and Voluntary Sector Quarterly*, *30*(3), 569–587. https://doi.org/10.1177/0899764001303012

Cai, C. W. (2019). Triple-entry accounting with blockchain: How far have we come? *Accounting & Finance, 61*(1), pp. 71-93. https://doi.org/10.1111/acfi.12556

Carlin, T. (2019). Blockchain and the Journey Beyond Double Entry. *Australian Accounting Review*, *29*(2), 305–311. https://doi.org/10.1111/auar.12273

Cazenave, B., & Morales, J. (2021). NGO responses to financial evaluation: auditability, purification and performance. *Accounting, Auditing and Accountability Journal*. https://doi.org/10.1108/AAAJ-01-2020-4397

Christ, K. L., & Helliar, C.V. (2021). Blockchain technology and modern slavery: Reducing deceptive recruitment in migrant worker populations. *Journal of Business Research*, *131*, 112–120. https://doi.org/10.1016/j.jbusres.2021.03.065

Cordery, C., Belal, A.R. and Thomson, I. (2019), "NGO accounting and accountability: past, present and future", *Accounting Forum , 43*(1), pp. 1-15, doi: 10.1080/01559982.2019.1593577.

Costa, E., Parker, L. D., & Andreaus, M. (2014). The Rise of Social and Non-Profit Organizations and their Relevance for Social Accounting Studies. In *Accountability and Social Accounting for Social and Non-Profit Organizations (Advances in Public Interest Accounting, Vol. 17)* (pp. 3–21). https://doi.org/10.1108/S1041-706020140000017003

Costa, E., Pesci, C., Andreaus, M., & Taufer, E. (2019). Empathy, closeness, and distance in non-profit accountability. *Accounting, Auditing and Accountability Journal*, *32*(1), 224–254. https://doi.org/10.1108/AAAJ-03-2014-1635

Costa, E., Ramus, T., & Andreaus, M. (2011). Accountability as a Managerial Tool in Non-Profit Organizations: Evidence from Italian CSVs. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations, 22*(3), 470–493. https://doi.org/10.1007/s11266-011-9183-7

Coyne, J. G., & McMickle, P. L. (2017). Can blockchains serve an accounting purpose? *Journal of Emerging Technologies in Accounting*, *14*(2), 101–111. https://doi.org/10.2308/jeta-51910

Creswell, J. W. (2009). *Research design: qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, California: SAGE Publications Inc.

Crofts, K., & Bisman, J. (2010). Interrogating accountability: An illustration of the use of Leximancer software for qualitative data analysis. *Qualitative Research in Accounting & Management*, *7*(2), 180–207. https://doi.org/10.1108/11766091011050859

Dai, J., & Vasarhelyi, M. A. (2017). Toward blockchain-based accounting and assurance. *Journal of Information Systems*, *31*(3), 5–21. https://doi.org/10.2308/isys-51804

de Villiers, C., Kuruppu, S., & Dissanayake, D. (2021). A (new) role for business – Promoting the United Nations' Sustainable Development Goals through the internet-of-things and blockchain technology. *Journal of Business Research, 131*, 598–609. https://doi.org/10.1016/j.jbusres.2020.11.066

Dewi, M. K., Manochin, M., & Belal, A. (2019). Marching with the volunteers. *Accounting, Auditing & Accountability Journal*, *32*(4), pp. 1117-1145. AAAJ-10-2016-2727. https://doi.org/10.1108/AAAJ-10-2016-2727

Dhanani, A. and Connolly, C. (2015), "Non-governmental Organizational Accountability: Talking the Talk and Walking the Walk?", *Journal of Business Ethics*, *129*(3), pp. 613-637, doi: 10.1007/s10551-014- 2172-1.

Dillard, J., & Vinnari, E. (2019). Critical dialogical accountability: From accounting-based accountability to accountability-based accounting Title. *Critical Perspectives on Accounting*, *62*, 16–38. https://doi.org/https://doi-org.access.library.unisa.edu.au/10.1016/j.cpa.2018.10.003

Dubnick, M. J., & Frederickson, H. G. (2010). Accountable agents: Federal performance measurement and third-party government. *Journal of Public Administration Research and Theory*, *20*(SUPPL. 1), i143–i159. https://doi.org/10.1093/jopart/mup039

Ebrahim, A. (2003). Accountability in practice: Mechanisms for NGOs. *World Development*, *31*(5), 813–829.

Edwards, M., & Hulme, D. (1996). *Beyond the magic bullet: NGO performance and accountability in the post-cold war world*. Kumarian Press West Hartford, CT.

Epstein, M. J., & McFarlan, F. W. (2011). Measuring the Efficiency and Effectiveness of a Nonprofit's Performance. *Strategic Finance*, *93*(4), 27–34.

Fanning, K., & Centers, D. P. (2016). Blockchain and Its Coming Impact on Financial Services. *Journal of Corporate Accounting & Finance*, *27*(5), 53–57. https://doi.org/10.1002/jcaf.22179

Flick, U. (2006). *An introduction to qualitative research*. London: Sage Publications Ltd.

Frey-Heger, C. and Barrett, M. (2021), "Possibilities and limits of social accountability: The consequences of visibility as recognition and exposure in refugee crises", *Accounting, Organizations and Society*, Vol. 89, p. 101197, doi: 10.1016/j.aos.2020.101197.

Gibbon, J. (2012). Understandings of accountability: an autoethnographic account using metaphor. *Critical Perspectives on Accounting*, *23*(3), 201–212. https://doi.org/10.1016/j.cpa.2011.12.005

Gibson, W. J., & Brown, A. (2009). *Working with Qualitative Data*. London: Sage Publications Ltd.

Goddard, A. (2020). Accountability and accounting in the NGO field comprising the UK and Africa – A Bordieusian analysis. *Critical Perspectives on Accounting*, 102200. https://doi.org/10.1016/j.cpa.2020.102200

Goddard, A., & Assad, M. J. (2006). Accounting and navigating legitimacy in Tanzanian NGOs. *Accounting, Auditing & Accountability Journal*, *19*(3), 377–404.

Goonatilake, S. (2006), Recolonisation: Foreign Funded NGOs in Sri Lanka, Sage Publications India Pvt Ltd, Delhi.

Gray, R., Brennan, A. and Malpas, J. (2014), "New accounts: Towards a reframing of social accounting", *Accounting Forum*, Vol. 38 No. 4, pp. 258-273, doi: 10.1016/j.accfor.2013.10.005.

Grbich, C. (2007). *Qualitative data analysis : an introduction / Carol Grbich.* London: Sage Publications Ltd.

Grigg, I. (2005), "Triple entry accounting", Systemics, http://iang.org/papers/triple_entry.html.

Hailey, J. (2000). Indicators of identity: NGOs and the strategic imperative of assessing core values. *Development in Practice*, *10*(3–4), 402–407. https://doi.org/10.1080/09614520050116550

Hall, M., & O'Dwyer, B. (2017). Accounting, non-governmental organizations and civil society: The importance of nonprofit organizations to understanding accounting, organizations and society. *Accounting, Organizations and Society*, *63*, 1–5. https://doi.org/10.1016/j.aos.2017.11.001

Helliar, C. V., Crawford, L., Rocca, L., Teodori, C., & Veneziani, M. (2020). Permissionless and permissioned blockchain diffusion. *International Journal of Information Management*. https://doi.org/10.1016/j.ijinfomgt.2020.102136

Jayasinghe, K., & Wickramasinghe, D. (2011). Power over empowerment: Encountering development accounting in a Sri Lankan fishing village. *Critical Perspectives on Accounting*, *22*(4), 396–414. https://doi.org/10.1016/j.cpa.2010.12.008

Jeffrey Unerman, & Brendan O'Dwyer. (2006). Theorising accountability for NGO advocacy. *Accounting, Auditing & Accountability Journal*, *19*(3), 349–376. https://doi.org/10.1108/09513570610670334

Kaba, M. (2021). NGO Accountability: A Conceptual Review across the Engaged Disciplines. *International Studies Review*, *0*, 1–39. https://doi.org/10.1093/isr/viaa094

Kamuf, P. (2007). Accounterability. *Textual Practice*, *21*(2), 251–266. https://doi.org/10.1080/09502360701264428

Kingston, K.L., Furneaux, C., de Zwaan, L. and Alderman, L. (2020), "Avoiding the accountability 'shamritual': An agonistic approach to beneficiaries' participation in evaluation within nonprofit organisations", *Critical Perspectives on Accounting*, p. 102261, doi: https://doi.org/10.1016/j.cpa.2020.

Kuruppu, S. C., & Lodhia, S. (2019). Disruption and transformation: The organisational evolution of an NGO. *The British Accounting Review*, *51*(6), 100828. https://doi.org/10.1016/j.bar.2019.03.003

Kuruppu, S. C., & Lodhia, S. (2020). Shaping accountability at an NGO: a Bourdieusian perspective. *Accounting, Auditing & Accountability Journal*, *33*(1), 178–203. https://doi.org/10.1108/AAAJ-09-2016-2696

Manetti, G. (2014). The Role of Blended Value Accounting in the Evaluation of Socio-Economic

Impact of Social Enterprises. *Voluntas*, *25*(2), 443–464. https://doi.org/10.1007/s11266-012-9346-1

Marshall, C., & Rossman, G. B. (2011). *Designing Qualitative Research* (5th Ed.). Thousand Oaks, California: Sage Publications.

Mawdsley, E., Townsend, J. G., & Porter, G. (2005). Trust, accountability, and face-to-face interaction in North-South NGO relations. *Development in Practice*, *15*(1), 77–82. https://doi.org/10.1080/0961452052000321613

McKernan, J. F. (2012). Accountability as aporia, testimony, and gift. *Critical Perspectives on Accounting*, *23*(3), 258–278. https://doi.org/10.1016/j.cpa.2011.12.009

McKernan, J. F., & McPhail, K. (2012). Accountability and Accounterability. *Critical Perspectives on Accounting*, *23*(3), 177–182. https://doi.org/10.1016/j.cpa.2011.12.003

Messner, M. (2009). The limits of accountability. *Accounting, Organizations and Society*, *34*(8), 918–938. https://doi.org/10.1016/j.aos.2009.07.003

Moore, M. H. (2000). Managing for Value: Organizational Strategy in for-Profit, Nonprofit, and Governmental Organizations. *Nonprofit and Voluntary Sector Quarterly*, *29*(1), 183–204. https://doi.org/10.1177/0899764000291S009

Murtaza, N. (2012). Putting the Lasts First: The Case for Community-Focused and Peer-Managed NGO Accountability Mechanisms. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, *23*(1), 109–125. https://doi.org/10.1007/s11266-011-9181-9

Najam, A. (1996), "NGO accountability: a conceptual framework", *Development Policy Review*, Vol. 14 No. 4, pp. 339-354, doi: 10.1111/j.1467-7679.1996.tb00112.x/abstract.

O'Dwyer, B. (2004). Qualitative Data Analysis: Illuminating a Process for Transforming a 'Messy' but 'Attractive' 'Nuisance.' In C. Humphrey & B. Lee (Eds.), *The Real Life Guide to Accounting Research* (pp. 391–407). https://doi.org/10.1016/B978-008043972-3/50025-6

O'Dwyer, B. (2005), "The construction of a social account: a case study in an overseas aid agency", Accounting, Organizations and Society, Vol. 30, pp. 279-296.

O'Dwyer, B., & Boomsma, R. (2015). The co-construction of NGO accountability: Aligning imposed and felt accountability in NGO-funder accountability relationships. *Accounting, Auditing & Accountability Journal*, *28*(1), 36–68. https://doi.org/10.1108/AAAJ-10-2013-1488

O'Dwyer, B., & Unerman, J. (2008). The paradox of greater NGO accountability: A case study of Amnesty Ireland. *Accounting, Organizations and Society*, *33*(7–8), 801–824. https://doi.org/10.1016/j.aos.2008.02.002

O'Dwyer, B., & Unerman, J. (2010). Enhancing the role of accountability in promoting the rights of beneficiaries of development NGOs. *Accounting and Business Research*, *40*(5), 451–471. https://doi.org/10.1080/00014788.2010.9995323

O'Leary, S. (2017). Grassroots accountability promises in rights-based approaches to development: The role of transformative monitoring and evaluation in NGOs. *Accounting, Organizations and Society*, *63*, 21–41. https://doi.org/10.1016/j.aos.2016.06.002

O'Leary, S., & Smith, D. (2020). Moments of resistance: An internally persuasive view of performance and impact reports in non-governmental organizations. *Accounting, Organizations and Society*, *85*, 101140. https://doi.org/10.1016/j.aos.2020.101140

Parker, L. D. (2011). Building Bridges to the Future: Mapping the Territory for Developing Social and Environmental Accountability. *Social and Environmental Accountability Journal*, *31*(1), 7–24. https://doi.org/10.1080/0969160X.2011.556389

Pianezzi, D. (2021). We are what we tell : an enquiry into NGOs' organizational identity and accountability. *Accounting, Auditing & Accountability Journal*, Vol. 34 No. 8, pp. 1824-1850. https://doi.org/10.1108/AAAJ-06-2020-4647

Pimentel, E., & Boulianne, E. (2020). Blockchain in Accounting Research and Practice: Current Trends and Future Opportunities*. *Accounting Perspectives*, *19*(4), 325–361. https://doi.org/10.1111/1911-3838.12239

Rahmani, R. (2012). Donors, beneficiaries, or NGOs: whose needs come first? A dilemma in Afghanistan. *Development in Practice*, *22*(3), 295–304. https://doi.org/10.1080/09614524.2012.664622

Reith, S. (2010). Money, power, and donor–NGO partnerships. *Development in Practice*, *20*(3), 446–455. https://doi.org/10.1080/09614521003709932

Roberts, J. (2009). No one is perfect: The limits of transparency and an ethic for 'intelligent' accountability. *Accounting, Organizations and Society*, *34*(8), 957–970. https://doi.org/10.1016/j.aos.2009.04.005

Rozario, A. M., & Vasarhelyi, M. A. (2018). Auditing with smart contracts. *International Journal of Digital Accounting Research*, *18*(December 2017), 1–27.

https://doi.org/10.4192/1577-8517-v18_1

Schmitz, H. P., Raggo, P., & Vijfeijken, T. B. (2012). Accountability of Transnational NGOs Aspirations vs. Practice. *Nonprofit and Voluntary Sector Quarterly*, *41*(6), 1175–1194. https://doi.org/10.1177/0899764011431165

Schmitz, J., & Leoni, G. (2019). Accounting and Auditing at the Time of Blockchain Technology: A Research Agenda. *Australian Accounting Review*, *29*(2), 331–342. https://doi.org/10.1111/auar.12286

Scobie, M., Lee, B., & Smyth, S. (2020). Grounded accountability and Indigenous self-determination. *Critical Perspectives on Accounting*, 102198. https://doi.org/10.1016/j.cpa.2020.102198

Sinclair, A. (1995). The chameleon of accountability: Forms and discourses. *Accounting, Organizations and Society*, *20*(2–3), 219–237. https://doi.org/10.1016/0361-3682(93)E0003-Y

Tanima, F. A., Brown, J., & Dillard, J. (2020). Surfacing the political: Women's empowerment, microfinance, critical dialogic accounting and accountability. *Accounting, Organizations and Society*, 101141. https://doi.org/10.1016/j.aos.2020.101141

Tanima, F.A., Brown, J., Wright, J. and Mackie, V. (2021), "Taking critical dialogic accountability into the field: Engaging contestation around microfinance and women's empowerment", *Critical Perspectives on Accounting*, p. 102383, doi: https://doi.org/10.1016/j.cpa.2021.102383.

Tregidga, H. and Milne, M.J. (2020), "Not at our table: Stakeholder exclusion and ant/agonistic engagements", *Critical Perspectives on Accounting*, p. 102265, doi: 10.1016/j.cpa.2020.102265.

Uddin, M. M., & Belal, A. R. (2019). Donors' influence strategies and beneficiary accountability: an NGO case study. *Accounting Forum*, *43*(1), 113–134. https://doi.org/10.1080/01559982.2019.1589905

Yermack, D. (2017, March 1). Corporate governance and blockchains. *Review of Finance*, Vol. 21, pp. 7–31. https://doi.org/10.1093/rof/rfw074

Yin, R. (2009). *Case Study Research: Design and Methods*. Thousand Oaks, California: Sage publications, Inc.