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## **Towards a participatory digital ethnography of blockchain governance**

Ellie Rennie, Michael Zargham, Joshua Tan, Luke Miller, Jonathan Abbott, Kelsie Nabben, Primavera De Filippi

### **Introduction**

In decentralised blockchain systems, the ongoing operations, maintenance and improvement of platforms and applications require that people who are unknown to each other arrive at a collective decision. Depending on the platform or application, participants may signal their preference by updating software or sending a transaction to a smart contract. Actions that seem like routine technical or administrative processes can have far-reaching consequences for how digital infrastructures develop and whose interests they serve.

Preceding these actions are conversations that take place on social platforms, also ordered through technical architectures. Such “off-chain” deliberations on social platforms, together with “on-chain” software-based rules and actions, make up what has become known as blockchain governance (Werbach 2018), Dgov (Semenchuck 2018), or “DeGov” (Buterin 2021). Identifying effective governance of decentralised blockchain infrastructures is an urgent concern for those involved with implications for the economies that blockchain technologies operate in (Schneider 2021).

Where platform governance of centralised infrastructures calls for greater explainability of automated decision-making to limit harmful outcomes, decentralised communities choose automation to make governance processes manageable and transparent in conditions of low trust. Software may be used to define pre-agreement of processes or actions, reducing scope for error or attack, or improving responsiveness to exogenous influences. In this paper our chief concern is how to understand “governance interactions” within such systems, defined by Kooiman as “solving societal problems or creating societal opportunities; attending to the institutions as contexts for these governing interactions; and establishing a normative foundation for all those activities” (Kooiman 2003, 2).

Focusing on governance interactions makes governance interpretable and analysable (Kooiman 2003), yet in this case requires understanding the roles of, and relationships between, human and non-human actors. We began experimenting with bringing some of the tools of decentralised governance into our own research approach. Aside from ameliorating the challenges of data collection on and across platforms, these tools enabled the co-creation of datasets, illuminated issues and moments that we might otherwise have missed, and helped to turn observation into dialogue. The insight we derive from this is that

embedding humanities and social science research inside human-machine entities is not just a means to understand decentralised futures but may help meet their requirement for attentiveness over their own boundaries and dynamics.

We describe our tools and methods for understanding automated futures through a case study of the SourceCred community, an organization using, developing and maintaining open source software called SourceCred. The SourceCred codebase is also used by other decentralised communities for various organisational functions, including reputation and compensation. SourceCred shows how novel forms of measurement (made possibly by automation) can change the nature of online coordination towards new ways of working and belonging for online communities. Ethnography provides a means to observe the processes of “attending to” the algorithm and the experiences of working for and with a system. In the case of SourceCred, governance interactions were inseparable from the values, care and attention of the community’s members towards the protocol and each other.

### **From platform governance to governance surface**

To govern, in broad terms, is to constrain the field of action that is available to others (Foucault 1982). Governance occurs in both political and non-political spheres and is shaped by systems and tools, evolving “in relation to what is technically possible for it to see at whatever historical moment” (Bratton 2016). Blockchain infrastructures are governmental in that they are systems for coordination, permitting some actions and limiting others, through what is prescribed in software code. They are also governed in the organizational governance sense - “a sort of constitutional law of the firm” (Colebatch 2014, 309) – entailing rules, standards and policies.

Existing approaches to understanding governance of and by technology provide only limited tools for blockchain governance research due to their focus on centralised infrastructures. The term “platform governance” typically refers either to attempts to curb the power of platforms through regulation (governance of platforms), or to the actions and powers of corporations in setting terms for use (governance by platforms). Scholarship in this area recognises that corporations, even when working within the limits of law, have significant discretion to develop their own rules, which may conflict with other rights and responsibilities (Suzor 2019). Platform corporations derive power through their use of data, including capabilities of pre-emption and surveillance that enact social and political processes through machines of their own creation (Gorwa 2019). At the epistemological level, technology affects how we access knowledge and modifies what we can know and be expected to know (Hong 2020). Andrejevic (2020) observes that automated systems program context, resulting in a “mode of governance that dispenses with processes of

subjectification by operating directly on the environment of the individual actors, shaping their conduct by intervening in their surrounding milieu” (18). While the temptation is to see this purely as a problem of transparency, others look instead to the material and ideological influences that may be at play in the use of algorithms (Ananny and Crawford 2018). Researchers from the fields of humanities and social sciences have argued in favour of explainability, which can mean descriptive accounts as well as critical simulation (see Burgess et al. in this issue?). Our focus in this paper is on “explainability to whom?” recognising that decentralised communities seek validation of socio-technical resilience rather than explanations of the mathematical dimensions of systems.

Ethnographic research has focused on the power and practices of users of platforms. Platform governance is complicated and extended by users; tactics applied or overlaid to automated systems may subvert platform logics and create different outcomes. For instance, ethnography has revealed how “boundary work” (Nippert-Eng 2008) is performed by users to delineate and manage social connections, privacy and information sharing within or despite the rules set by platforms (Marwick and boyd 2014). Others have examined how users can shape platforms through the creation of roles with specific governance functions (Gillespie 2018) or by deploying bespoke, externally created bots to enforce rules, manage spam, or monitor conversations on some platforms (Latzko-Toth 2014). Bots have been associated with problematic governance outcomes when added by external parties as they can alter the terms set by the platform unbeknownst to the user (Jhaver et al. 2019).

Like centralised computing infrastructures, blockchain protocols disrupt political geography, present new challenges for jurisdictions, and have immense amounts of capital associated with them (two trillion USD across blockchains at the time of writing). Automation is also a feature of blockchain platforms, from smart contracts that execute predefined agreements to actions performed by bots beyond the purview and control of most users (such as Miner Extractible Value (Daian et al. 2019)).

However, users of decentralised blockchain systems experience different configurations of power to what is available on centralised platforms; they can maintain custody of assets, control their personal information, and perform peer-to-peer transactions. Some applications on decentralised platforms are ‘unstoppable’ – meaning immutable code – where no-one controls the keys to make direct changes and all actions are automated (such as Tornado Cash). At the other end of the spectrum are systems where the power to enact change lies with the community, sometimes with elaborate structures and processes (for instance, MakerDAO). On-chain decision-making in such cases is typically performed using a decentralised autonomous organisation (DAOs), which Hassan and De Filippi define as a “blockchain-based system that enables people to coordinate and govern themselves

mediated by a set of self-executing rules deployed on a public blockchain, and whose governance is decentralised—i.e., independent from central control” (Hassan and De Filippi 2021, 1).

There is a growing awareness within blockchain communities that decentralized governance, particularly when tokens are involved, can leave these systems and their constituents vulnerable. Some key issues that confront blockchain projects include: The level of engagement in voting processes (including who votes); the influence of those holding a disproportionate amount of tokens in plutocratic systems; conflict of interest in voting; problems related to identity and reputation (including bots influencing outcomes); collusion; and transparency (Zietz, GEV article). DeGov may also bring new networked forms of accountability. The possibility that members may leave (including copying software to “fork” the protocol) creates pressure on those most invested to be responsive and attune to group needs, although this can be constrained by the costs of exit.

Existing conceptions of platform governance are therefore insufficient for understanding these systems. The question of *how* they are governed requires paying particular attention to the capabilities and actions of users in relation to the boundaries that are set for and by them. Zargham et al. (2021) have helpfully named this the ‘governance surface’, which narrowly construed is the set parameters that are subjected to human oversight. Broadly construed, the governance surface is the set of actions made available by a software system that can affect changes to the policies enacted by that software which can include adjusting who has access to set or change parts of the system in the future. By clearly identifying the governance surface, it is possible to analyze the relative stability of a sociotechnical system’s properties to governance interactions as well as the system’s capacity to adapt to changes in circumstances.

### **Ethnography for decentralised systems**

Some blockchain governance interactions are readily observable through code repositories such as Github or through on-chain transactions. Others occur on sites where people propose, debate and, in some cases, vote on improvements, including Discourse for polls and Gnosis Snapshot for votes. Typologies of governance can be developed by looking at how these various tools are implemented. However, some aspects of blockchain governance are more difficult to trace.

To govern, people must develop a sense of what they hope or expect to see, which they arrive at through learning, mimetic desire (Girard), and agonism (Mouffe). If these aspects of governance are visible anywhere it is on the social channels established by blockchain developers for users. These channels provide for the everyday consumption of information

and announcements, and are where people go for assistance, to learn, complain and question. Blockchain communities develop norms, behaviours, and languages to describe themselves within these spaces. Participants may take on moderation roles as they accumulate expertise and status, shaping not only the conduct of people but also the non-human administrators and enforcers of rules.

For decentralised communities grappling with the forces of decentralisation, participation, and automation, ethnography may be the only means by which to surface and analyse unstructured processes, including some vulnerabilities in governance design (either as an input into a mixed methods approach or a standalone exploration of a decentralised community). For instance, while the rules may be visible in Github, activities such as reorganizing the permissions in github or discord (creating private spaces, or defining roles for read/write access, etc) may alter the governance surface, yet be difficult to see, requiring close attention to a project and its community. Research with decentralised communities may also uncover power dynamics within the group, including behaviours and influence on decision outcomes that may have serious consequences for the protocol.

Blockchain projects grappling with decentralised governance are aware that what occurs in informal spaces is part of decision-making processes and their outcomes, evident in efforts to conscript people with experience from other domains to patch gaps in governance and community management. Some projects have commissioned research to better understand what is occurring within Discord communities. For instance, research for UniSwap by Shorin et al (2021) found the forum to be disconnected to governance discussions happening elsewhere and recommended means to address this.

However, ethnographers face particular challenges inside these servers. Ethnography typically involves linking up information that is discovered with information that is presented by others. Participants knowingly or unknowingly offer ideas, experiences, and information to the researcher either in passing or through formal interviews. In the process, a dataset is collated, which typically stays with the researcher until the written ethnography is produced. When communication takes place on Discord, logistical and ethical issues can inhibit these workflows. Researchers must deal with high volumes of conversation; when an event is happening, the text chat will move fast, retrievable only through scrolling. Ensuring that participants are aware of the research becomes difficult when people come and go from servers regularly. In creating software that automates consent and data management functions, we also found that ethnography became a more participative process.

Our work is not the first to grapple with these issues in researching digital communities; ethnographers in the fields of STS and communication studies have written of the

ambiguity that comes from only being able to see a portion of the action occurring within a system, including what can seem like fleeting interactions (Pink et al. 2015; Kozinets 2020). As with other studies of online communities, observing governance within blockchain communities entails a shift from “intimate knowledge of face-to-face communities and groups” to looking at communities who may be networked, emergent and changing (Burrell 2009; also Marcus 1995). In online contexts, even longstanding members of these communities - including those who play key roles - may only ever have a partial view into what is taking place. Hine (2020) writes that when undertaking ethnography for the internet, the researcher must accept a “perpetual feeling of uncertainty, of wondering what has been missed, and attempting to build interpretations of events based on sketchy evidence” (pg). To deal with the vast amount of information online, ethnographers have deployed compatible techniques from social science and data science. The tools we created command that researchers interact with a community during the process of data collection and provide the community with visibility over data and data collection processes.

## **Encountering SourceCred**

We approached SourceCred to be our first partner in this endeavour partly because the SourceCred product is used in a number of other blockchain communities to make work traceable and in some cases linked to a payment system. Their CredRank algorithm is adapted from Google’s PageRank algorithm (first developed by Larry Page and Sergey Brin at Stanford, Brin & Page 1998) which “computes “importance” of nodes in a graph based on the “importance” of nodes connected to it” (Miyazono 2020; see also Zargham 2019 who was an early contributor to the project). SourceCred’s plugins, which are used to gather information, currently work across GitHub, Discourse and Discord.

A token called Cred is minted for each individual contributor according to the calculations of the algorithm. While Cred is non-transferrable, a second token, Grain, is distributed to those with Cred. Within the SourceCred community, Grain is redeemable for USDC (a cryptocurrency pegged to the US dollar) at a rate determined by the community. Those who use instances of SourceCred choose whether or not to issue their own token analogous to Grain (not all do). SourceCred is also interesting from a governance perspective as it has potential to address identity provability problems which are a common challenge in DAOs, in that it creates a default “proof of humanity” by providing visibility over individual contributions across multiple modes of interaction (eg Discord, Discourse, Github, etc). SourceCred developer Seth Benton writes that SourceCred can act as a Sybil-resistant identity tool as “as meaningful contributions over time are difficult for bots to fake” (Benton 2019).

SourceCred's Discord plugin has been a topic of contention within the community at times as it weights contributions that occur in an informal space - exactly the interactions we set out to observe. Measuring Discord contributions and assigning Cred to them was first proposed by founder Dandelion in 2019: "We could have a plugin that reads the history of our Discord server and finds every message with at least one [SourceCred emoji] reaction. Then, it can create a node for that message, with edges connecting the reactors to the message that generated the reaction" (Decentralion, October 2019). A SourceCred emoji was soon created for this purpose and a debate around whether to restrict Cred to GitHub and Discourse ensued. Some argued that Discourse - the platform used for formal proposals - was for more considered contributions and therefore sufficient, while others thought this biased people who were willing to "jump through hoops and self promote" (Decentralion). When our research commenced, community sentiment was falling on the side of recognising diverse contributions and supportive of the Discord plugin as a means to achieve this.

SourceCred was also interesting to us because it was in the process of transitioning its own governance model, moving from a "Temporary Benevolent Dictator" (TBD) to a non-hierarchical structure still to be determined. Various models had been proposed and discussed already, including sociocracy and Indigenous governance systems. The community was also confronting the prospect of a fork, wherein a small group of former SourceCred members had decided that they would copy the codebase of SourceCred and set up a new entity (and forming a new SourceCred DAO). According to the proposer, SourceCred seemed disjointed from the "ecosystem", that experimentation with governance and social activities had become the primary focus, and weightings were favouring Discord contributions. While the community was not opposed to forks in principle (the code is open source), the way it was undertaken was viewed to be hostile by those working on SourceCred at the time and there was a significant risk that existing partners would see the forked version as the legitimate one given the proposer's mention of the Web3 ecosystem. These governance-focused events produced a series of important conversations within the SourceCred community, carried across the various communication platforms used by the group. Our aim was to locate governance interactions of significance. Before discussing this, we first describe Discord and SourceCred's use of it.

## **Discord and the SourceCred server**

The Discord <sup>[i]</sup> platform launched in 2015 and designed with the sociability of online communities in mind (Baguley 2019). Discord is a community center - the beating heart of many blockchain communities. Once a Discord server is created, access is granted via invitation, although this can be a link on a public website. Some channels in a server may be

restricted to a core team or only accessible once the user has agreed to abide by certain conditions. Individuals may have multiple Discord accounts in one or more servers, and many use pseudonyms. Those providing technical support and answering questions may be volunteers unknown to the project's core team except through their presence inside the server and related platforms.

One of the attractions of Discord for blockchain communities is its flexible design, allowing admins to configure their server to include channels for specific conversations and bots that automate some tasks. In Discord, bots can serve as upholders of good behaviour and social standards, such as making sure the user understands expectations relating to conduct before being allowed to read or respond to discussions. While the architecture of Discord servers may vary widely, it is the place where people are encouraged to wander in to find information and potentially friends and collaborators.

Although topics are delineated into channels – such as “governance”, “support” and “general” – conversations can easily spill across these boundaries. Some blockchain communities are linked, appearing as ‘bridges’ between servers, reflecting the nested nature of these protocols and projects. The openness of many forums and the open API can also make Discord susceptible to scammers, who can crawl servers for lists of members, sending direct messages to people on those lists. Messaging individuals with questions or to seek their consent for data collection and analysis can be unproductive, time-consuming and easily ignored.

SourceCred uses Discord as its primary place for discussion, announcements and meetings. Social gatherings also take place; a channel where people chat and dance and another for quiet working. Posts that appear on other platforms are often linked to inside Discord, including meeting minutes. More formal deliberation centres on the Discourse site, a platform where people post proposals for others to comment on, but will often be carried over into Discord. Bots are used extensively within the SourceCred Discord server (including bespoke bots), alongside particular non-software systems that have been introduced to make online governance interactions more effective, including the use of American sign language in video calls to signal when one wishes to say something, express sentiment on a discussion point, or to ask for clarification. Use of emojis within the platform are more than responses as the SourceCred algorithm calculates Cred based on emojis. The elaborate system of tools and protocols – human and software – are extraordinary to encounter; beyond an online community, the server is a decentralized workplace and a lab for the development of DAO tools.

## **Using MetaEth**

We created a bot and bridge initially in order to automate the administrative aspects of data collection. Our research with SourceCred officially commenced when an administrator within the SourceCred server ran software to establish a bridge with our own Discord server and to add a bot that we had created: the Telescope. The outcome of these actions meant communication would stretch between Discord servers (SourceCred's and our own), introduce a new space (channel) for SourceCred members, and the collection of information and metadata would commence. The data could be exported into a spreadsheet or carried into a publicly accessible database called Govbase where we record the formal properties of governance (Tan - also add footnote to say we are all involved in Govbase etc). Within the SourceCred server our channel was known as MetaEth (short for ethnography, not Ethereum).

What was initially intended by our team as a simple set of tools to collect key conversations and events from inside a Discord server evolved into a system for networked ideas and inputs sourced across the various applications that SourceCred communicated through. The Telescope bot was set up so that anyone within the Discord server could activate it using the telescope emoji. Once applied to a comment, the bot would then send a message to the project's channel within the researchers' server and ask whether to request permission to add the comment to the dataset (a measure designed to prevent someone spamming the dataset). If a researcher responded yes, the bot would then send a direct message to the author of the comment asking them if they were happy for it to be included, and whether they would like it used anonymously or with attribution to their Discord handle (see diagram). If the author agreed to the comment being included in the dataset, the comment would appear in the approved messages feed, either in an anonymized form or with the associated username, depending on the author's preference. If the author disapproved, the comment would not be added to the dataset (this happened with approximately 20% of requests). Following a suggestion by a community member, we changed the consent process to an 'opt in once' design. In this rendition, an author approves the first comment to be tagged as well as future comments. They continue to be alerted when a new comment of theirs is tagged by the Telescope and may withdraw individual comments even after they have given initial consent.

We found that using a bot to manage the consent process is useful in online communities where members may have arrived after the researchers have introduced themselves to the group. The Telescope bot will relay information about the research and tell the participant who they should contact if they have concerns.



## **MetaEth in action**

People quickly began to grasp how the bot could be used: to go back through significant posts to direct the researcher to historical events or discussions; to highlight when a meeting was happening that might be useful to the researcher; and to direct the researcher to a conversation that had occurred on another platform, including meeting minutes or audio recordings. As expected, some community members used the Telescope bot more than others (taking on the role of “informants”) and were more present in our channel discussions. From these engagements we ended up with a dataset that contained important decisions and linked us directly to where a discussion had taken place on a key governance matter. We also achieved clarity over which comments we might quote directly in our research.

The bot also enabled a form of participatory ethnography, with similarities to Tacchi’s (2015) Ethnographic Action Research (EAR) method, in which local researchers (working in development settings) collect and share information, assisting researchers to understand the possibilities of technologies while improving their own practice. As comments began to be approved by their authors and appeared in our channel in the SourceCred server, members of the community began discussing the curated list of comments inside the channel. For instance, a member had missed a post when it was first authored and began responding to it, reopening discussion of a particular proposal. In another case, a member of the research team asked a question about a proposed change to the algorithm that had appeared in GitHub, asking whether it had been put to a governance decision (overhauling the “scoring rules” amounted to a significant change in policy with implications for all stakeholders). Members of the development team responded that it was still an experimental design, undertaken at the request of a partner organization who suggested that the PageRank-based algorithm was difficult for their non-technical community members to interpret. A discussion ensued, revealing the change was of ‘existential’ importance, and the developer leading the change had chosen to tread carefully. While this suggests that there is a role for processes that induce transparency, the contextual detail that emerged from discussion (typical of ethnographic methods) provided insight into the ways that values and concern for others influenced code upgrades at SourceCred. Processes that were not visible from knowing the formal boundaries of governance - including exploration, concern and deliberation that had not yet become visible in formal governance processes - were illuminated in the channel. As one person described it, we had seen a new protocol emerge when it was still being ‘turned over by the mycelium’. Similarly, their requests to us, such as the change to the consent process as well as suggestions that we ask more questions, are shifting our research practice.

We also experienced first-hand how automation can obscure some governance processes. If the telescope emoji was applied to a comment in the server that had been generated by another bot, the post would not show up as bots cannot give consent (a fixable problem by assuming default consent). Automation also initially reduced our ability to add context. After some anxiety at how people might respond to requests that appeared from a bot without any indication as to how it might be used, we altered the system so that the curator could add commentary to a requested message using the reply function in the requested messages feed. Curators were then able to add reflections on the context of the comment or why they would like to include it in the dataset. These comments could be exported to assist with coding the data.

Through these systems we were able to better understand SourceCred itself, including how individuals alter their ways of working and interacting with each other to accommodate the algorithm they work on and for. The SourceCred algorithm needs to know when a contribution has occurred, which is achieved by people recording their own and others' work. This can manifest as expressions of gratitude and support for work in channels called "props" and "didathing". With this comes a heightened awareness of the conditions of their own and each other's labour, how different types of work are weighted, and the legacy of past contributors which never disappears from the tally. Not everything is attributable to the algorithm; the qualities, ethics and concerns of SourceCred arose from the life experiences of individuals involved, some of whom live in geographical proximity to each other (the word 'family' is used often). The same systems would likely generate different outcomes when transposed into a different group and governance system. Suffice it to say that the people and automated systems of SourceCred challenge standard conceptions of workplace hierarchies and how infrastructures are built and maintained. It is precisely these differences that suggest to us that research on decentralized futures needs to look beyond the transparency and explainability of algorithms and towards degrees of attentiveness – towards or because of – automated systems. For instance, to achieve the desired outcome of fair scores, instead of tweaking the tech to feel more fair, SourceCred have at times tweaked their behavioral norms.

While our work on blockchain governance is ongoing, our work with SourceCred has turned it towards looking at the social "closure" of (technical) automated systems. SourceCred the codebase is automated but SourceCred the community is autonomous. And yet the capacity for that autonomous community to self steer so productively is in part attributable to SourceCred code which is a kind of cybernetic sensory perception. The possibilities of blockchain governance and decentralised automated futures lie within this relationship.

## **Conclusion**

In a conference presentation (discovered via a video linked to within the Discord server), the founder of SourceCred, Dandelion, says that SourceCred's version of the PageRank algorithm works in conditions where there is strong community moderation, relying on the attention of the community to prevent it being gamed (ref). While platforms such as Google use obscurity to achieve system security, Dandelion theorised that in decentralised systems security is achieved by people observing each other's actions.

Once our research tools had been added to the SourceCred server, it became apparent to us that research can play a part in generating and focusing attention on issues and questions, possibly enabling the same kind of 'security' in governance processes. While it is too early for us to say whether our approach might impact on governance, participatory and partly automated ethnographic methods can help us understand how decentralized futures are unfolding.

The Telescope bot and its associated channels are, at one level, just a tool – a means for dealing with large amounts of data, managing consent, and communicating with research participants. However, it can also change the research in meaningful ways by surfacing the priorities of a community of users, including their perceptions of key events or issues. It also creates an explicit set of boundaries around approved records, providing those in the forum to know what is on the official record. Falzon (ref) writes that ethnographers “think of their data as a gift from their informants, with all the implications of reciprocity that gift exchange implies” (pg). If anything, the Telescope bot makes the reciprocity implications stronger, establishing expectations for interaction that are more immediate than ethnographers may be used to.

The onus remains with the researchers to understand the context of what is in the dataset, and to question and analyse the data in relation to the broader system. However, the community can be an interlocutor in this process, actively identifying points of interest and seeking responses from the researchers. By using these tools, we also made ourselves a participant in the systems that we seek to study, a product of decentralised human curation and automated administration.

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[i] Blockchain communities can be found on various social channels, including Telegram, Slack and Discord.