Cuando Ostrom se encuentra con blockchain: explorando las potencialidades de blockchain para la gobernanza procomunal

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¡Hola!

My name is **David Rozas** (@drozas)
Postdoc researcher @p2pmod. ½ computer scientist, ½ sociologist. Trying to bring together the social and the technical to foster Commons-Based Peer Production.
Outline

◇ Key concepts around decentralised technologies
◇ Debate on blockchain-based governance: beyond markets and states?
◇ Commons governance, Ostrom’s principles and example: community network
◇ Affordances of blockchain for commons governance
◇ Conclusion and future work
Blockchain

- Distributed & persistent ledger/database
- Without a third party
- E.g. cryptocurrency, such as Bitcoin (Nakamoto, 2008), without banks
- But more than that!
Smart contract (Szabo, 1997)

- Snippets of code on the blockchain
- Decentralised execution
- Rules automatically enforced without central authority
Distributed Autonomous Organisation (DAO)

- Self-governed organisation controlled by rules implemented in smart contracts
- Analogy with legal organisation
  - Legal documents (bylaws), define rules of interaction amongst members
  - DAO members’ interactions are mediated by rules embedded in DAO code
Blockchain-based governance*

- Predominant techno-determinist discourses (e.g. Swan, 2015; Heuermann, 2015; Hayes 2016):
  - Over-reductionist with social aspects, such as distribution of power
  - Embed market-driven, utilitarian, individualistic values

- Not new... Internet as space for utopia/dystopia (Wellman, 2004)

* Governance with/through blockchains... not of!
Blockchain-based governance

- Critical stand, but reinforcing traditional institutions (e.g. Atzori, 2015; Atzori & Ulieru, 2017):
  - Central authorities necessary for democratic governance
  - Blockchain in non-transformative ways (e.g. increase transparency of institutions (Nguyen, 2016), avoid tax fraud (Ainsworth & Shact, 2016))
  - Ignore power for collective action & self-organisation
Blockchain-based governance

- Perspectives of blockchain-based governance beyond markets & states?
- Bringing together literature and commons perspectives
- Blockchain as source of potentialities (and risks) for commons governance (Benkler, 2006; Fuster-Morell et al., 2014)

Disclaimer:
- Theoretical, starting empirical work!
- Focus on potentialities, plenty of tensions and risks
Commons-Based Peer Production

◇ Mode of production (Benkler, 2006) characterised by (Fuster-Morell et al., 2014):

- Collaborative process
- Peer-based
- Commons-process
- Favouring reproducibility

◇ Radically different to “Silicon Valley” sharing economy
(Breaking) the tragedy of the commons

- Hardin (1968) states how shared resources are depleted by (homo-economicus) individuals acting out of self-interest

- Traditional view to avoid this logic — “If I do not use it, someone else will”, manage commons through
  - Private ownership
  - Centralised public administration
Ostrom’s (1990) principles

1. Community **boundaries**
2. Rules adapted to **local** conditions
3. **Participatory** decision-making
4. Monitoring
5. Graduated **sanctions**
6. **Conflict resolution** mechanisms
7. **Recognition** by higher authorities
8. **Multiple layers** of nested enterprises
An example: Guifi.net

◇ Free, open & neutral Community Network (CN)
◇ +35k nodes
◇ Internet Service Provider, infrastructure as a commons
◇ Ostrom principles (Baig et al., 2015)
◇ Not only wireless, fiber
Guifi.net: some actors

- Some actors:
  - Users/customers
  - Community network hackers & makers
  - Professional operators
  - Formal institution: Fundació
Guifi.net: compensation system

- Balances contributions accounted for resource usage of operators, monitored by Fundació (Baig et al., 2015)

(Baig et al., 2015)
Blockchain as source of affordances*

1. Tokenisation
2. Self-enforcement and formalisation of rules
3. Autonomous automatisation
4. Decentralisation of power over the infrastructure
5. Transparentisation
6. Codification of trust

* “functional and relational aspects which frame, while not determining, the possibilities for agentic action in relation to an object” (Hutchby, 2001; p.244). We frame them as processes in this analysis.
1. **Tokenisation**

Transforming rights to perform an action on an asset into a data element on the blockchain (e.g. access reports in medical field)
Tokenisation

◇ Guifi.net: measure and distribute value drawing on tokens (Selimi et al., 2018)

◇ Beyond:
  ■ Rights more easily and granularly defined, propagated and/or revoked
  ■ Artefacts as source of explicitation of less visible forms of power and value
2. Self-enforcement & formalisation of rules

Encoding clauses into source code, automatically self-enforced, executed without the need for a central authority: smart contracts (Szabo, 1997)
Self-enforcement & formalisation

◇ Guifi.net:
  ▪ Capping rules for network use: e.g. enforces a bandwidth limit, penalises misuse
  ▪ Local rules of compensation system more visibly discussed
  ▪ Autonomy for decision-making for local aspects in Barcelona by those in Barcelona, and vice-versa

◇ Beyond:
  ▪ Rules for pooling, capping or mutualising
  ▪ Explicitation
  ▪ Autonomy from higher authorities
3. Autonomous automatisation

Using DAOs (Decentralised Autonomous Organisations) to automatise organisational processes
Autonomous automatisation

- Guifi.net (and beyond):
  - Monitoring and/or graduated sanctions to the DAO
  - Exploration of potential conflicts
  - Facilitating creation of nested layers:
    - Transferring resources amongst nodes
    - DAOs coordinating smaller DAOs
4. Decentralisation of power over the infrastructure

Communalising ownership and control of tools through decentralised infrastructure
Power over infrastructure

◇ Guifi.net:
  - Main platform of collaboration ([www.guifi.net](http://www.guifi.net)) controlled by Fundació
  - Monitoring infrastructure could be decentralised
  - Shape power dynamics for negotiations between Fundació and local levels

◇ Beyond:
  - Relationships between technical and social power (Forte et al., 2009, pp. 64-68). As in Wikipedia (Tkacz, 2014; Jemielniak, 2016)
    - Facilitates “right to fork”
    - New conditions of negotiation
5. **Transparentisation**

Opening organisational processes and associated data, relying on persistency and immutability of blockchain.
Transparentisation

◊ Guifi.net:
  ▪ More transparency in maintaining common infrastructure

◊ Beyond:
  ▪ Long tradition in open and participative processes
  ▪ Scaling up monitoring and conflict resolution

Who fixed what?

Monitored by Fundació (and operators unofficially)
6. Codification of trust

Codifying trust into “trustless systems”: facilitate agreement between agents without requiring a third party, providing certain degree of trust.
Codification of trust [!]

◇ Aware of techno-determinist market-driven discourses:
  ■ Focus on contractual transactions amongst selfish individuals, hobbessian values: “Crypto-leviathan”
    (Reijers et al., 2016)
    ▪ Shift of trust: code is law?
◇ Re-interpret “trustlessness” as:
  ▪ Partial, limited property
  ▪ Integrating social culture and practices -> encoding (certain) degree of trust between nodes: interoperability
Codification of trust

◇ Guifi.net (and beyond):
  - Internal interoperability: locally-shaped platforms, autonomously governed, interoperating between them and/or broader level
    E.g. local nodes in Guifi.net
  - External interoperability: coordination between different collectives
    E.g. meta-cooperatives, different notions of value
    (De Filippi and Hassan, 2015)
### Summing up

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<th>Tokenisation</th>
<th>Self-enforcement and formalisation</th>
<th>Autonomous automation</th>
<th>Decentralisation of power over the infrastructure</th>
<th>Transparency</th>
<th>Codification of trust</th>
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<td>(1) Clearly defined community boundaries</td>
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<td>(2) Congruence between rules and local conditions</td>
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<td>(3) Collective choice arrangements</td>
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<td>(6) Conflict resolution mechanisms</td>
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<td>(7) Local enforcement of local rules</td>
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<td>(8) Multiple layers of nested enterprises</td>
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Peer production (and beyond)

Diversity of areas (Fuster-Morell et al. 2016) ...

... and beyond: social economy, platform cooperativism
Plenty of tensions & risks to explore

- **Tokenisation:** extreme quantification and data fetishism *(Sharon & Zanderbengen, 2017)*

- **Self-enforcement & formalisation:** concentration of power in coders, lack of reflexivity *(De Filippi and Hassan, 2018)*, extreme formalisation, breaking dynamics, gaming the platform, ...

- **Transparentisation:** opening processes is far more than opening data *(Atzori, 2015)*, right to be forgotten *(Khan, 2016; Mayer-Schönberger, 2011)*
Blockchain-based governance: our approach

◇ Situated technology: focus on situational parameters, aware of cultural context, making visible the invisible, incorporating social meanings (Bell, Genevieve, et al. 2013)

◇ Mutual-shaping (Quan-Haase, 2012):
  ■ Critical with technological determinist perspectives & limitations
  ■ Social shaped character of blockchain
  ■ But understood as possible agent of change

◇ As potential source of affordances (Gibson, 1979; Hutchby, 2001)
When Ostrom Meets Blockchain: Exploring the Potentials of Blockchain for Commons Governance
In conclusion & future work

- Bringing together literature on peer production to governance through/with blockchain debate: Ostrom’s principles
- Identification of potential affordances
- Emergence of research questions and useful categories for empirical exploration

Theoretical, need to explore boundaries, risks, models, culture, as situated technology... time to go to the field!
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De Filippi, P. and Hassan, S. (2018). "Blockchain technology as a regulatory technology: From code is law to law is code." arXiv preprint arXiv:1801.02507


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- Jonhston (2014), http://www.johnstonslaw.org/ accessed on 29th May 2018
¡Gracias!

Any questions?

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