P2P MODELS

When Ostrom Meets Blockchain: Exploring the Potentials of Blockchain for Commons Governance

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Hi!

I am 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

- 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-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

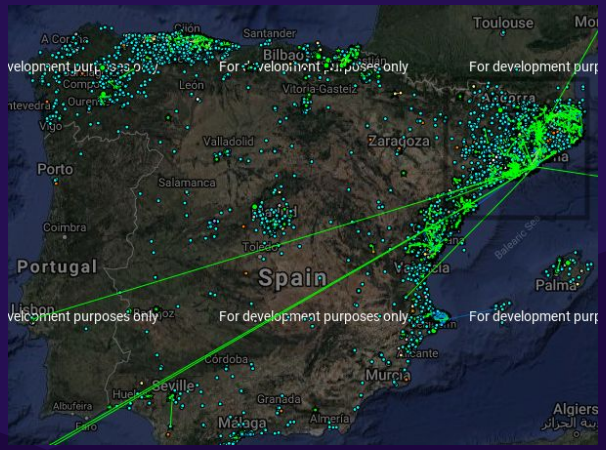
Blockchain-based governance

- 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

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

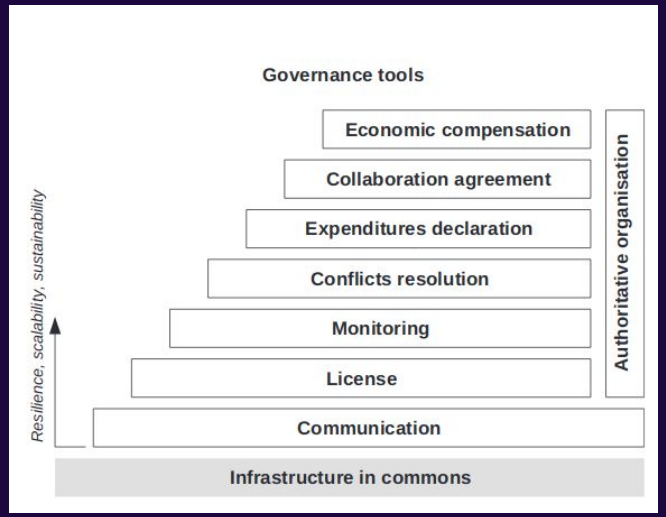
Guifi.net: some actors

- Some actors:
  - Users/customers
  - Community network hackers & makers
  - Professional operators
  - Formal institution: *Fundació*

Goufone

Guifi.net: compensation system

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

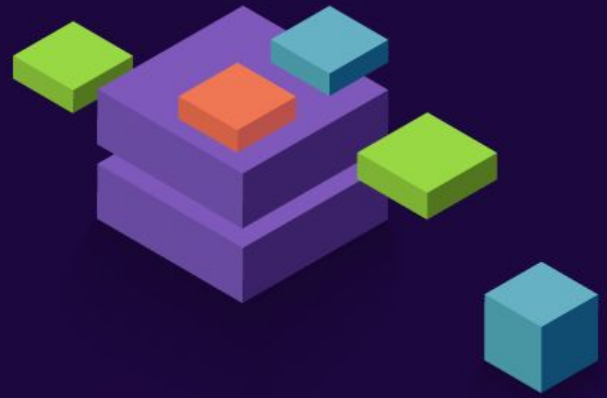


(Baig et al. , 2015)

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

Towards Blockchain-enabled Wireless Mesh Networks

Mennan Selimi, Aniruddh Rao Kabbinale, Anwaar Ali, Leandro Navarro, Arjuna Sathiaseelan

(Submitted on 2 Apr 2018)

quick mesh project

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

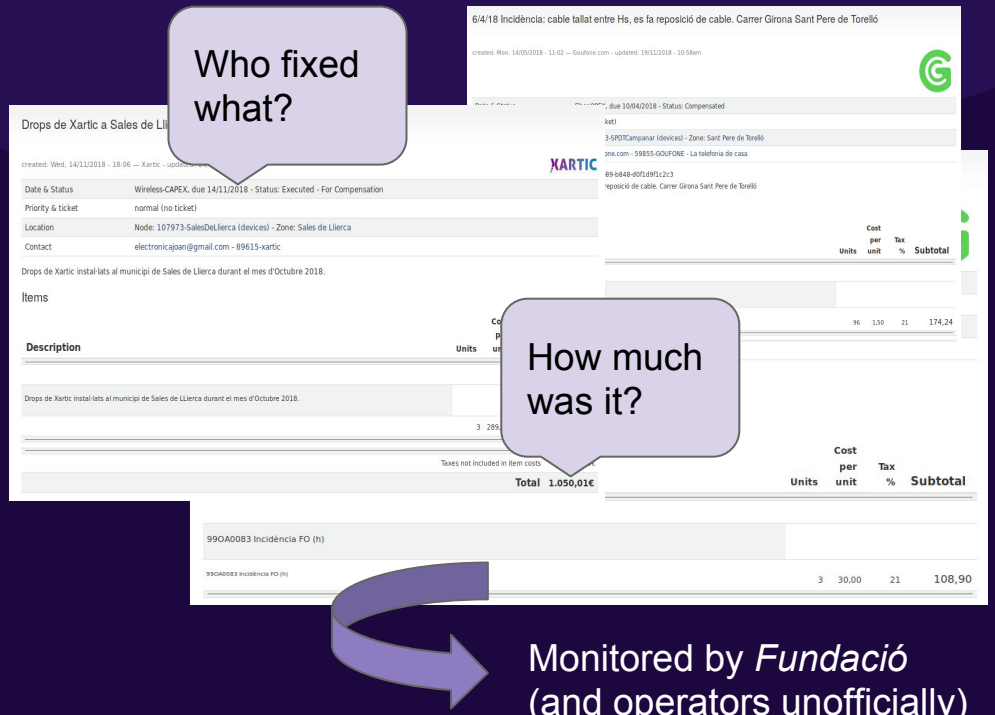
- Guifi.net:
  - Main platform of collaboration (ww.guifi.net) controlled by *Fundació*
  - Monitoring infrastructure could be decentralised
  - Shape power dynamics for negotiations between *Fundació* and local levels
- Beyond:
  - Relationships between technical and social power (Forte et al., 2009, pp. 64-68). As in Wikipedia (Tkacz, 2014; Jemielniak, 2016)
  - Facilitates “right to fork”
  - New conditions of negotiation

5. Transparentisation

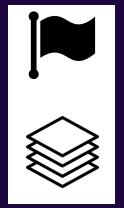
Opening organisational processes and associated data, relying on persistency and immutability of blockchain

Transparentisation

- Guifi.net:
  - More transparency in maintaining common infrastructure
- Beyond:
  - Long tradition in open and participative processes
  - Scaling up monitoring and conflict resolution



6. Codification of trust

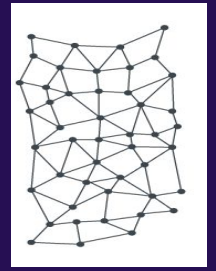


Codifying trust into “trustless systems”: facilitate agreement between agents without requiring a third party, providing *certain* degree of trust

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



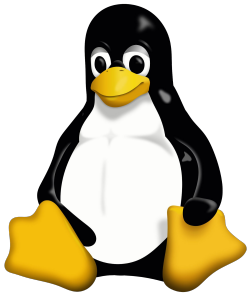
- Guifi.net (and beyond):
  - Internal interoperability: locally-shaped platforms, autonomously governed, interoperating between them and/or broader level
    E.g. local nodes in Guifi.net
  - External interoperability: coordination between different colectives
    E.g. meta-cooperatives, different notions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

Summing up

	Tokenisation	Self-enforcement and formalisation	Autonomous automatisation	Decentralisation of power over the infrastructure	Transparentisation	Codification of trust
(1) Clearly defined community boundaries	✓					
(2) Congruence between rules and local conditions	✓	✓		✓		
(3) Collective choice arrangements	✓			✓		
(4) Monitoring		✓	✓	✓	✓	
(5) Graduated sanctions		✓	✓			
(6) Conflict resolution mechanisms			✓		✓	
(7) Local enforcement of local rules		✓		✓		✓
(8) Multiple layers of nested enterprises			✓			✓

Peer production (and beyond)

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



P2PU

amara

... and beyond: social economy, platform cooperativism

SMartib

cleta

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)

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!

Working paper at SSRN

SSRN
Tomorrow's Research Today

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Thanks!

Any questions?

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