P2P MODELS

When Ostrom Meets Blockchain

Exploring the Potentials of Blockchain for Commons Governance

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23rd January 2020, Business School, University of Sydney, Australia

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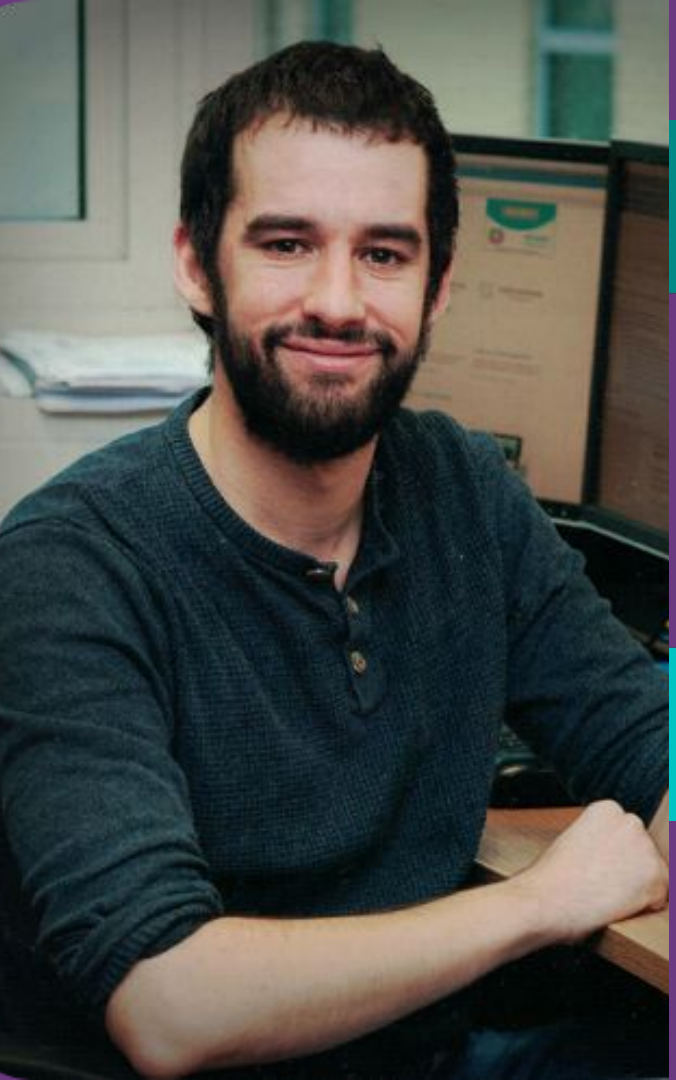


¡Hola!

I'm 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

1.

P2PModels & key concepts around decentralised technologies.

2.

Debate on *blockchain-based* governance: beyond markets and states?

3.

Commons governance, Ostrom's principles and example: community network.

4.

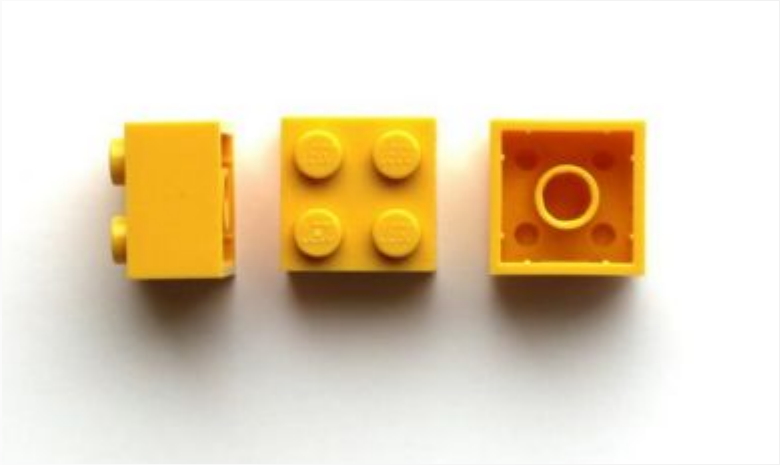
Affordances of blockchain for commons governance.

5.

Conclusion and future work.

P2P MODELS

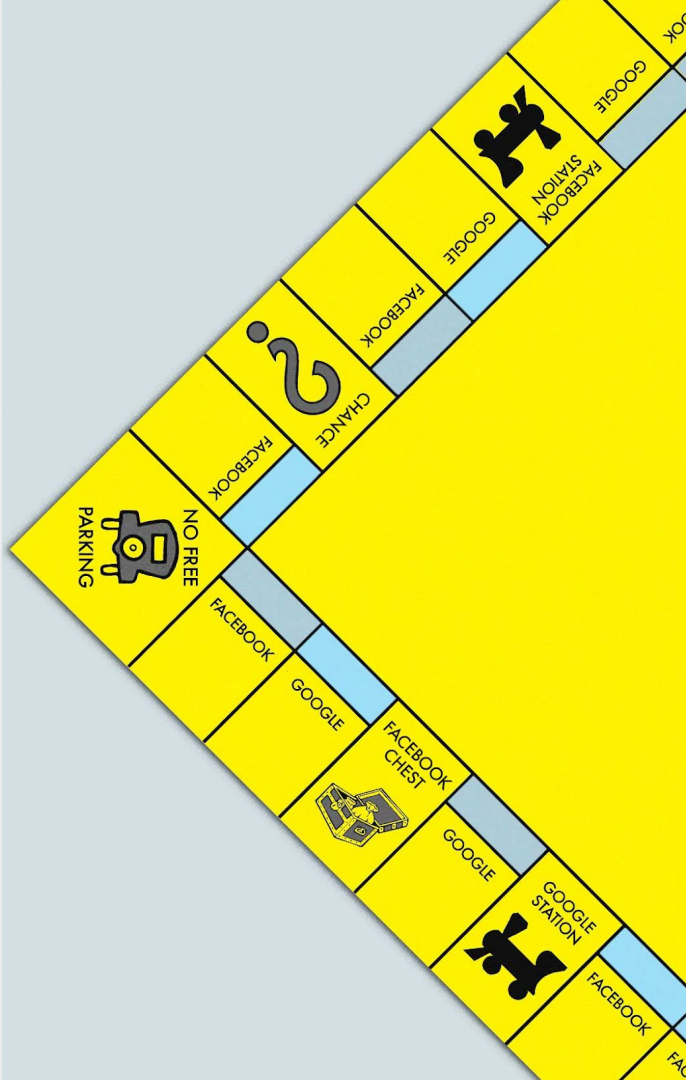
P2PModels: Three challenges of collaborative economy



Infrastructure

Centralised Monopolies

- Today’s Collaborative Economy dominated by large centralised platforms
- Concentrate massive amounts of user data



Governance

Disempowered Communities

- Collaborative Economy platforms mediate the interaction of large communities
- However, users have no say in the platform

Value

Concentration of Profits

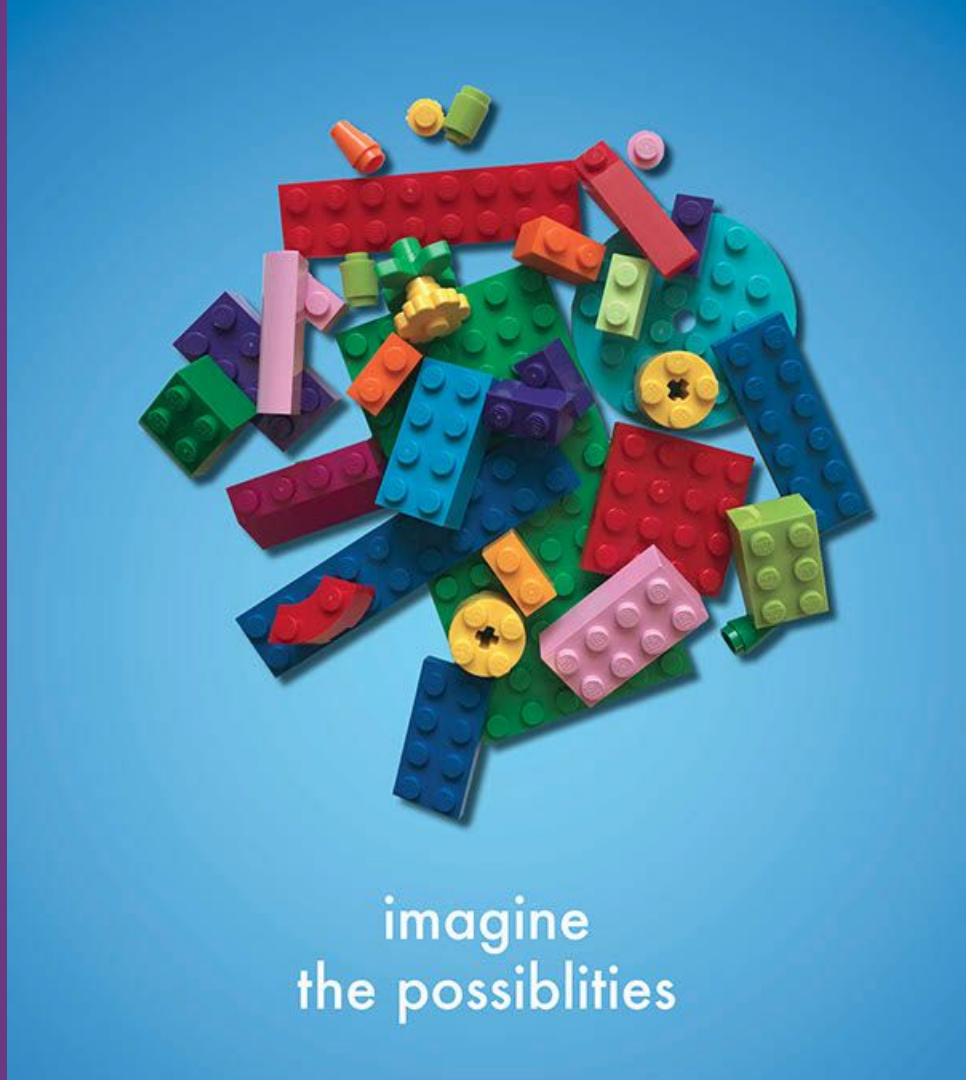
- Major industry players concentrate profit and appropriate value
- Users rarely rewarded for their work.

Can blockchain help to tackle some of these problems?

THE PROJECT

1.

- **Provide a software framework to build decentralised infrastructure for Collaborative Economy**
- **Minimises dependencies from central points of control**



THE PROJECT

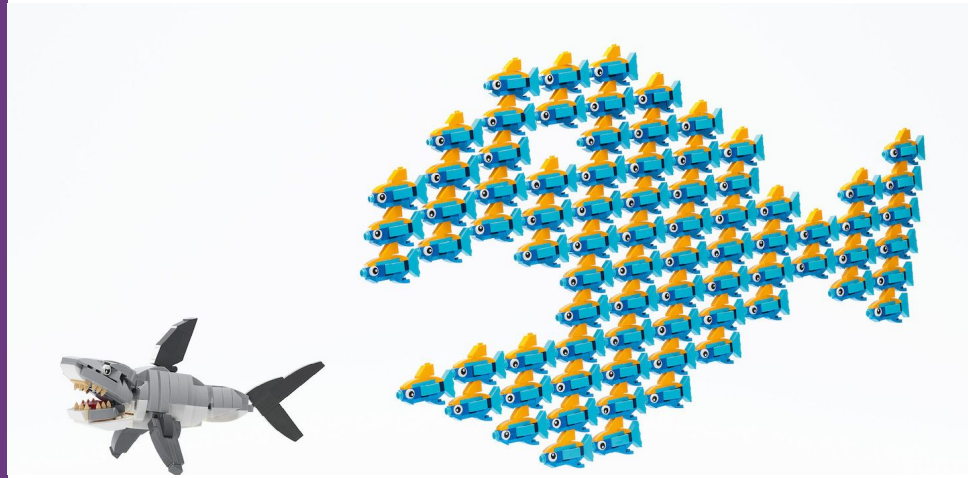
2.

- Enable democratic-by-design models of governance for communities
- Ensure higher levels of equality and inclusion

THE PROJECT

3.

- Enable value distribution models which improve economic sustainability
  - Participants
  - Organisations



THE PEOPLE

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Principal Investigator

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Feminist Anthropologist

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Comunication Strategist

Paulo J. Colombo

Blockchain Developer

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Geek Sociologist

Elena Martínez

UX Sorceress

Antonio Tenorio

Governance Alchemist

Eve Zelickson

Social Researcher

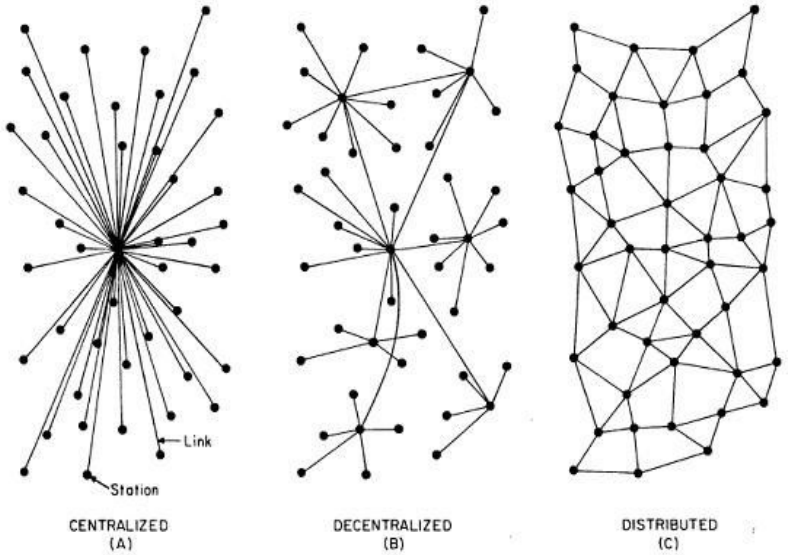
Rosa Chamorro

Financial & Administrative Matters

P2P MODELS

BLOCKCHAIN

- Distributed & persistent ledger/database.
- Without a third party.
- E.g. cryptocurrency, such as Bitcoin (Nakamoto, 2008), without banks.
- But more than that!
  - Storing in a decentralised way
  - Executing in a decentralised way



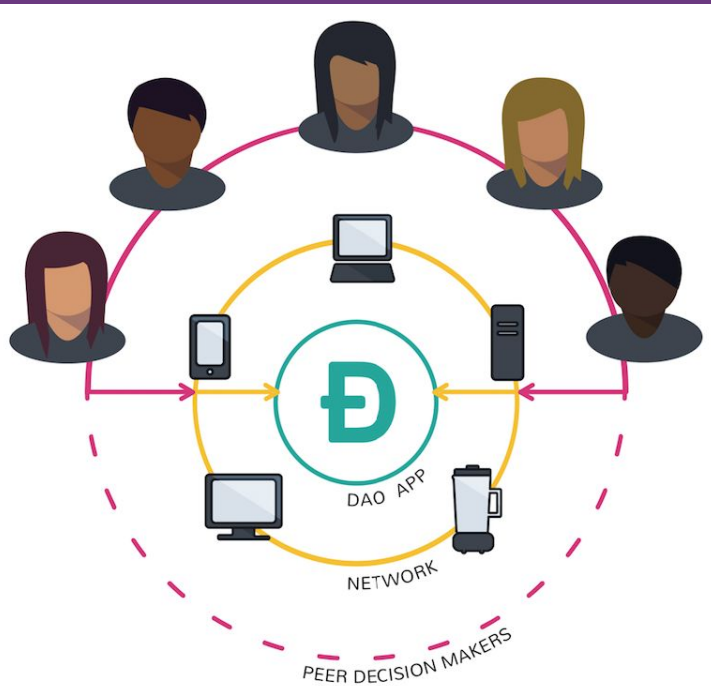
SMART CONTRACT

(Szabo, 1997)

- **Snippets of code on the blockchain.**
- **Decentralised execution.**
- **Rules automatically enforced without central authority.**

DAO
DISTRIBUTED AUTONOMOUS ORGANISATION

- Organisation (partially) controlled by rules implemented in smart contracts.
- Analogy with legal organisation.
  - Legal documents (bylaws), define rules of interaction amongst members.
  - DAO members' interactions are (partially) mediated by rules embedded in DAO code.



BLOCKCHAIN BASED GOVERNANCE*

*** Governance with/through blockchains... not of!**

- **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)**

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?**
- **Blockchain as source of potentialities (and risks) for commons governance (Benkler, 2006; Fuster-Morell et al., 2014)**
- **Bringing together literature and commons perspectives.**

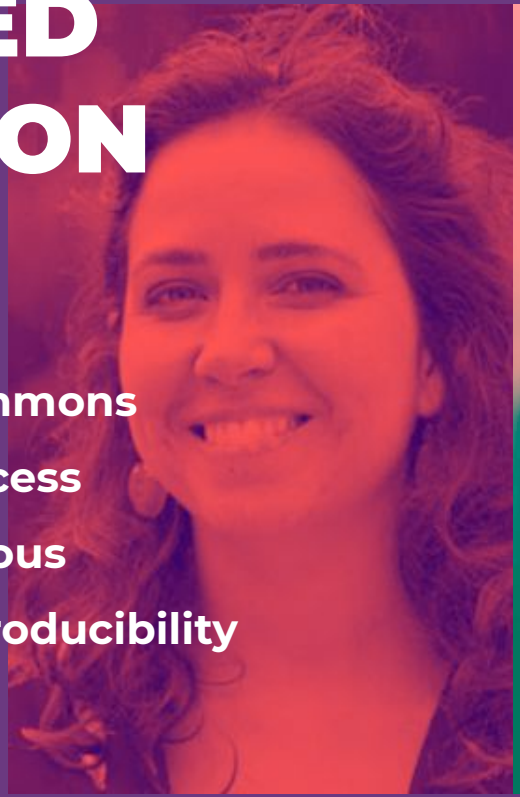
- Disclaimer:
  - Theoretical, ongoing empirical work!
  - Focus on potentialities, plenty of tensions and risks

COMMONS-BASED PEER PRODUCTION

Mode of production (Benkler, 2002; 2006) characterised by Fuster-Morell et al. (2014)

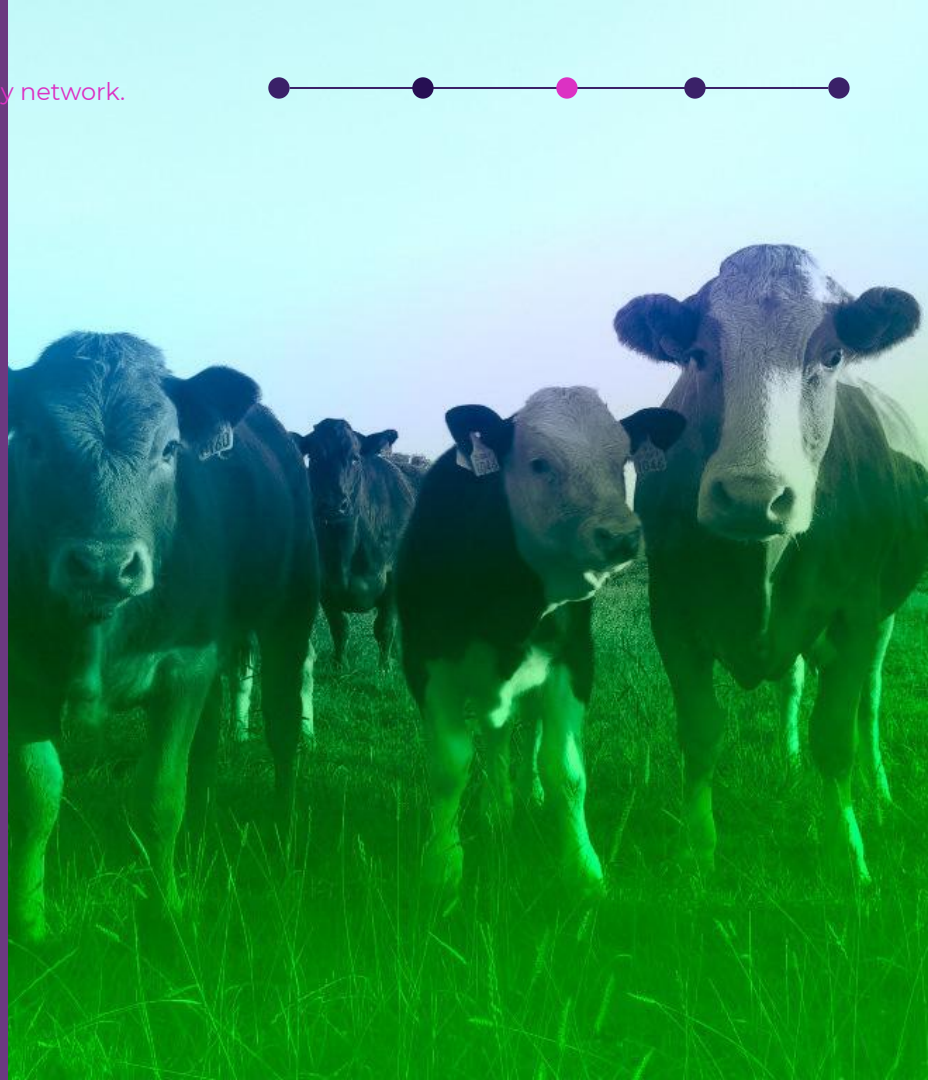
- ✓ **Collaborative process**
- ✓ **Peer-based**
- ✓ **Commons process**
- ✓ **Favous reproducibility**

> *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"
- Commons need to be managed by:
  - Private ownership.
  - Centralised public administration.



OSTROM PRINCIPLES
(1990)

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

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

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

1. Community boundaries
2. Rules adapted to local conditions
3. **PARTICIPATORY DECISION-MAKING**
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3.

Commons governance, Ostrom's principles and example: community network.

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
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Commons governance, Ostrom's principles and example: community network.

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
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Commons governance, Ostrom's principles and example: community network.

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6. **CONFLICT RESOLUTION MECHANISMS**
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Commons governance, Ostrom's principles and example: community network.

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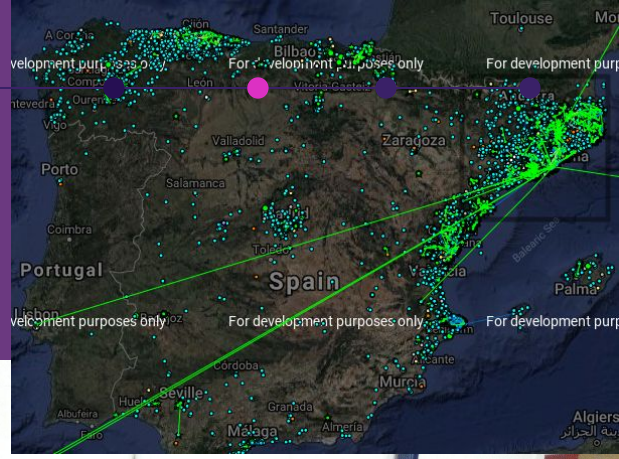
6. Conflict resolution mechanisms
7. **RECOGNITION BY HIGHER AUTHORITIES**
8. Multiple layers of nested enterprises

3. Commons governance, Ostrom's principles and example: community network.

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): 50k users on a daily basis (Guifi.net, 2020)
- +35k nodes, 65k km links (Guifi.net, 2020)
- Internet Service Provider, infrastructure as a commons.
- Ostrom's principles (Baig et al. , 2015).
- Not only wireless, fiber.



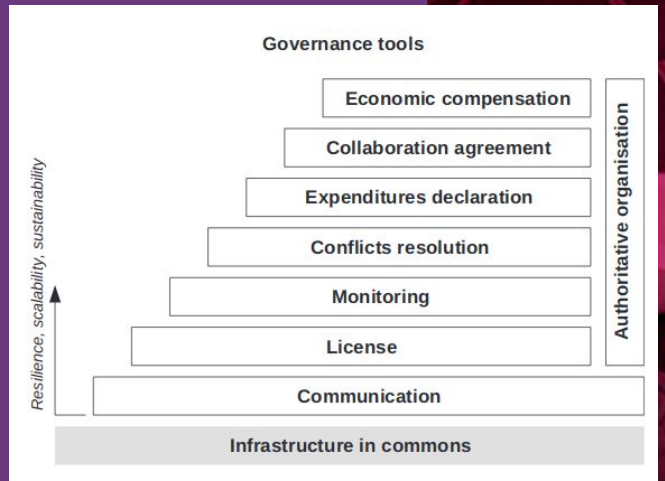
GUIFI.NET SOME ACTORS

- 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)



- **Examples:**
  - **Operators declare investments and expenditures to maintain infrastructure**
  - **Degrees of "commitment to the commons" monitored by *Fundació***
  - **Meetings for rules according to local conditions**
  - **Sanctions for misuse**

BLOCKCHAIN AS SOURCE OF AFFORDANCES*?

I
Tokenisation

II
Self-enforcement and formalisation of rules

III
Autonomous automatisation

IV
Decentralisation of power over the infrastructure

V
Transparentisation

VI
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 potential processes in this analysis.

TOKENISATION

Transforming rights to perform an action on an asset into a data element on the blockchain

TOKENISATION

- Guifi.net: measure and distribute value drawing on tokens (Selimi et al., 2018; Navarro et al., forthcoming)
- 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)

Blockchain models for universal connectivity

Leandro Navarro[1,2], Ignacio Castro[3,2], Arjuna Sathiaseelan[2], Emmanouil Dimogerontakis[1], Mennan Selimi[1], and Roger Baig[1,4]

quick mesh project

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: Barcelona, Madrid and vice-versa.
- Beyond:
  - Rules for pooling, capping or mutualising.
  - Explicitation.
  - Autonomy from higher authorities.

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.**

DECENTRALISATION OF POWER OVER THE INFRASTRUCTURE

IV

Communalising ownership and control of tools through decentralised infrastructure.

DECENTRALISATION OF POWER OVER THE INFRASTRUCTURE

Guifi.net:

- Main platform of collaboration (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.

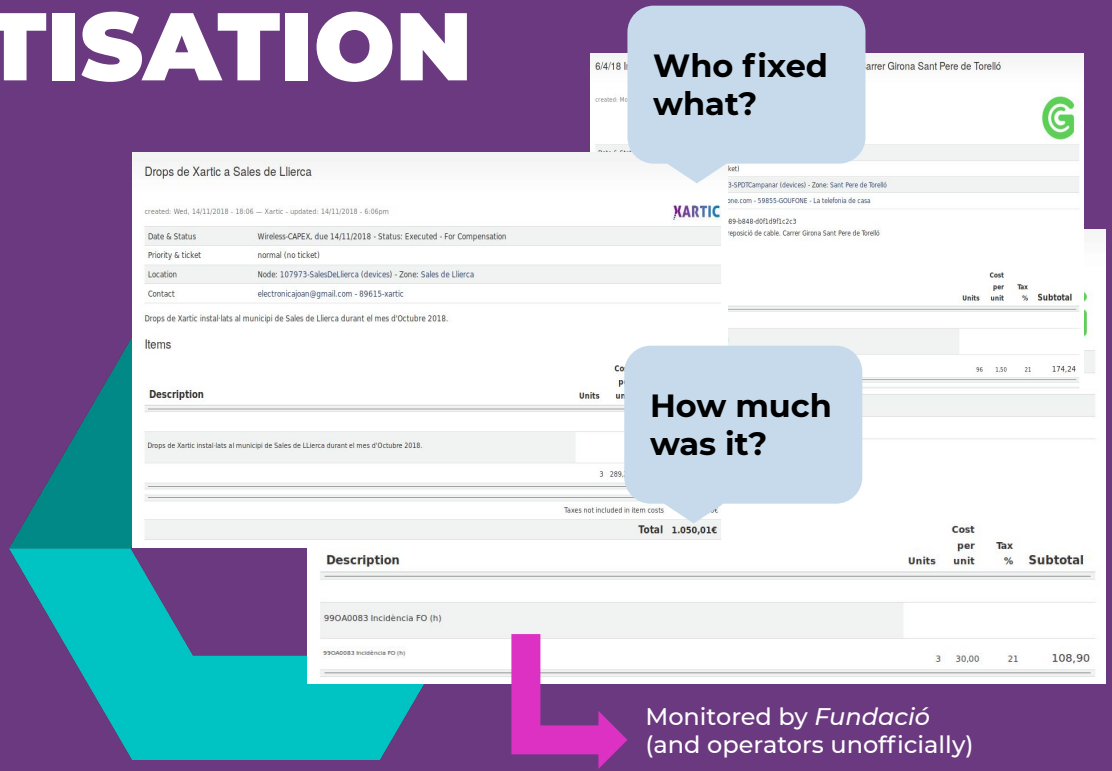
TRANSPARENTISATION

V

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



CODIFICATION OF TRUST

VI

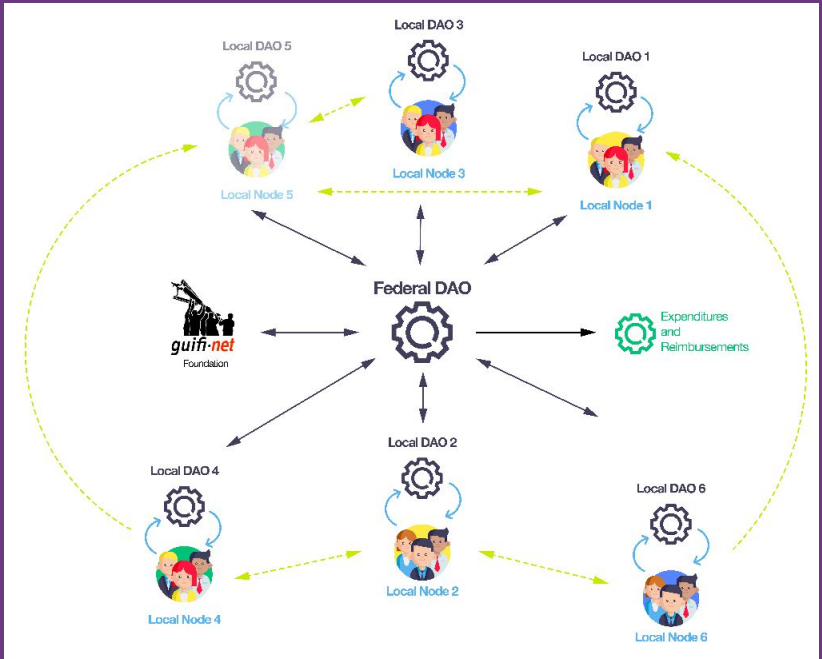
Codifying trust into “trustless systems”: facilitate agreement between agents without requiring a third party, providing *certain* degree of trust.

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)



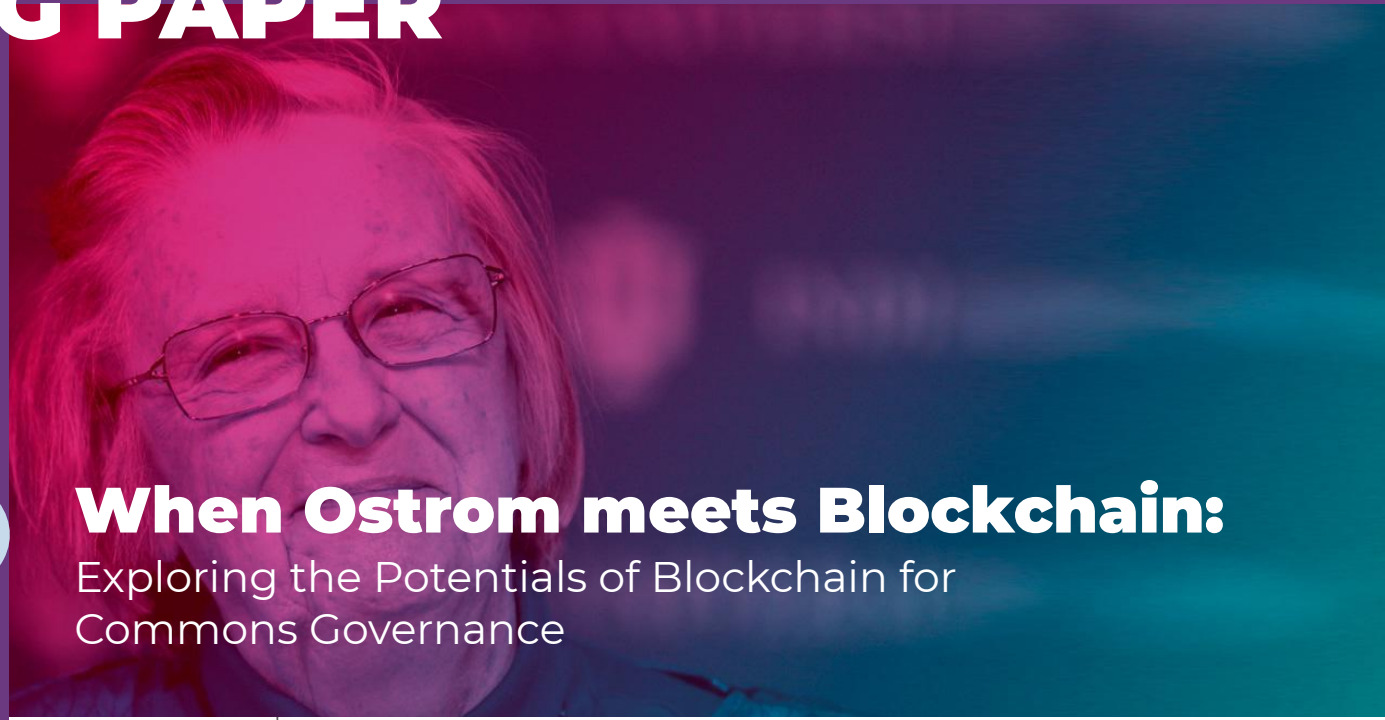
Rozas (2020)

SUMMING UP

	(I) Tokenisation	(II) Self-enforcement and formalisation	(III) Autonomous automatisation	(IV) Decentralisation of power over the infrastructure	(V) Transparentisation	(VI) 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			✓			✓

WORKING PAPER AT SSRN

Ping me for an updated version!



SSRN
Tomorrow's Research Today

Rozas, David and Tenorio-Fornés, Antonio and Díaz-Molina, Silvia and Hassan, Samer, When Ostrom Meets Blockchain: Exploring the Potentials of Blockchain for Commons Governance (July 30, 2018). Available at SSRN: https://ssrn.com/abstract=3272329 or http://dx.doi.org/10.2139/ssrn.3272329

PEER PRODUCTION
(AND BEYOND)

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

ARDUINO

WIKIPEDIA
The Free Encyclopedia

P2PU

amara

guifinet
Xarxa Oberta Lliure i Neutral

... and beyond: social economy, platform cooperativism

coop57 SCCL

SMartib

cleta

SOM energia

PLENTY OF TENSIONS & RISKS TO EXPLORE

TOKENISATION

- Extreme quantification and data fetishism (Sharon & Zanderbengen, 2017)

SELF-ENFORCEMENT & FORMALISATION

- Concentration of power in coders (De Filippi and Hassan, 2018)
- Extreme formalisation, breaking dynamics, *gaming* the platform...

TRANSPARENTISATION

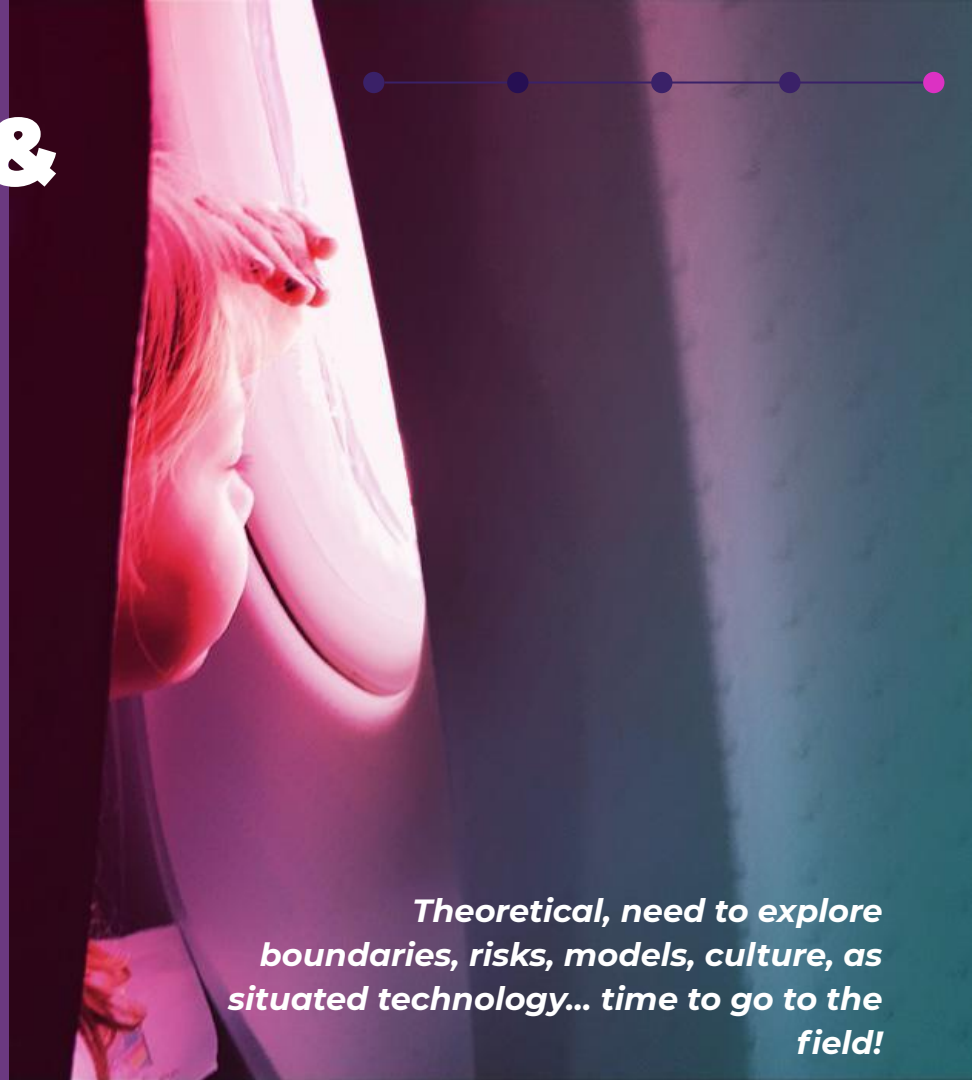
- Opening processes is far more than opening data (Atzori, 2015)
- Right to be forgotten (Khan, 2016; Mayer-Schönberger, 2011)

IN CONCLUSION & FUTURE WORK

1. Bringing together literature on peer production to governance through/with blockchain debate: Ostrom's principles.

2. Identification of potential affordances.

3. Useful categories for empirical analysis, emergence of research questions to be explored



Theoretical, need to explore boundaries, risks, models, culture, as situated technology... time to go to the field!

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THANKS!

Any questions?

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P2P MODELS | economy governance infrastructure

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Extra! New Case Studies

- Amara is a crowdsourcing platform for collaborative creation of subtitles.
- Relevance of platforms to mediate work.
- From volunteer (TED) to paid labour (AoD)

Timeline

2018-19

Social research

(started a year ago, ongoing)

2018-19

Intervention point: tasks allocation

2018-19

Development (starting early next year)

2018-19

Shifting decision-making (governance) of rules for distribution of value.

Research and experimentation

- Intervention point: tasks allocation. Beyond “first-come, first served” current competitive logic
- Future: reputation system, certificates, etc.

Smart

The Spanish branch of a cooperative that provides solutions to creative professionals.

Smart facilitates professionals to develop projects, provides training to improve skills and offers mutual services to comply with the law.

Methods

- Ethnographic method (qualitative techniques) and co-design dynamics.
- Gender perspective through the whole project and research.

Provisional prototype

- Easy-to-fill spreadsheet (link format) whose data will be stored in blockchain / IPFS (incensurable data bank)
- Basis for denouncing the contracting conditions by some companies or organisations.

The research

Timeline

06/18

Smart becomes our study case

12/18

Informal agreement of collaboration

01/19

Bottom up approach. Definition of the strategy of social research.

01-02/19

Ethnography. Interviews with cooperative members

02/19

Definition of the needs of the community. Design Thinking approach to imagine solutions for the challenges

03/19

Surveys and breakfast to validate or solutions

04/19

Co-design and co-creation workshops with Smart-IB members

07/19 - 11/19

Blockchain alert! Product definition. Back to the research and workshops

THANKS!

(again :-P)

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P2P MODELS | economy governance infrastructure

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