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Politecnico  
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**Nexa Center**  
*for Internet & Society*



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**DIGITAL COMMUN(UTIE)S.  
A SOCIO-ECONOMICS  
APPROACH**

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## Presentation outline

- Digital Commons: definition & political challenges
- Investing Digital (knowledge) commons
- What digital tells about commons?
- If time: Example of an analysis: Commons Algorithmic Management



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# Digital Commons: definition & political challenges



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- “Digital knowledge commons”: collective and voluntary practices of online knowledge production. First coined in Ostrom & Hess’ book (2006)
- Use the power of the Internet to provide people with new resources:
  - That everybody can use and contribute to
  - Free, Libre Open source Software projects (FLOSS), Wikipedia’s goal
- Raise several questions, at different social levels:
  - Participation. Why do people, organizations (“agents”) participate?
  - Organization. How do 10 to 1000 people coordinate to do so?
  - Economy. How these projects sustain, what are their impact on the industries?
  - Society. What social benefits? A new model to address collective needs?
- A discussion of these elements through the lens of the name “digital commons”

# Classic commons: A Political Challenge: producing non classic goods (Ostrom, 1990)

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- « Common-pool resources are sufficiently large that it is difficult, but not impossible, to define recognized users and exclude other users altogether. [...] Common goods are:
  - rivalrous: When one person consumes a good, another person is unable to subsequently consume that good and the overall stock of the good decreases. For example, when a fisherman catches a fish, no other fisherman is able to catch that fish.
  - non-excludable: There is no possibility to exclude anybody from consumption of this good. »
  - [https://en.wikipedia.org/wiki/Common\\_good\\_\(economics\)](https://en.wikipedia.org/wiki/Common_good_(economics))
  - E. Ostrom has studied and showed how these specific goods can be better managed by a group of people interested by their exploitation...
    - Better than when by the State or a private actor
    - Providing that it is always a social, institutional framework which organized the possibilities

- A classical commons is defined (Ostrom 1990) by:
  - institutional arrangements (based on uses, customs, in addition to law),
  - physical or material resources (e.g. software, technical monitoring devices),
  - **which allow the construction of exclusionary of access and rare or rival resource exploitation mechanisms.**
  - The project is to have a sustainable exploitation of this resource, thus to **manage collectively the withdrawals** on the resource.
- Digital Commons is kind of oxymoronic...
  - Knowledge, digitalization: free diffusion
  - Free, Libre Open source Software projects, Wikipedia's goal: to give (back) everybody access to these resources
  - Non rival, non exclusive: it's a public good
    - difficulty to produce, governance problems,
    - but commons? Where is the common pulled resource?

- Two visions of what a commons is, agreeing on being about:
  - The development of projects of polycentric governance of the production of collective goods
    - Digital project bloom in the 2000s:
  - The criticism of the State and the Market's capacity to manage collective needs for good
  - The troubling similarity of the governance mechanisms with classic commons...
- Is it enough to speak of digital commons?

# Vision 1: Digital commons: it is about collective governance!

- Is it enough to speak of digital commons?
  - Hess et Ostrom, 2007: yes, when polycentric governance and rules regarding the management of a resource which implies social dilemma
  - Mindel et al. (2018): so in the digital world, any collective action where people can coordinate through a platform is a commons (AirBnB is a common, as is Wikipedia, Facebook, GitHub, etc.)
- Community/polycentric governance put forward by Ostrom's work in commons' governance
  - Ostrom's interest is about collective governance... and easy parallel to make
- More than collective action coordination and governance?
  - What types of “goods” are produced?
  - Why do people participate?

=> production of what, by whom?



# Vision 2: Digital commons: it is about collective access production management!

- Another vision, more Intellectual Property Right oriented
    - Commons as resources available to people « independently from personal relations, authorization, access rights given by others » (Lessig, 2001, p. 85).
      - This is a public good (for the economist)
      - Evolution (Kapczynski, 2010): public goods managed by a group
      - A third way of producing public goods, beyond (an better than?) State and Market
  - New system of production (Benkler & Nissenbaum, 2006) :
    - “common based peer-production”
    - radically decentralized, collaborative and non-proprietary; based on the sharing of resources and products among scattered, flexibly connected individuals who cooperate with each other without relying on market signals or managerial hierarchies
    - Better on the definition of what is a digital commons, but...
  - Remains the question of why this group does that...
    - The classic question of public good production, and of incitations
    - IPR has been built to create incentives by providing a (temporal) monopoly for the producer
    - Strange to use IPR to “renounce” this monopoly
- => production (of what), by whom, why?

- Two visions of what a common is, according to Yochai Benkler:
  - Classic commons à la Ostrom
    - Physical commons, boundaries and situated/idiosyncratic regulation systems following certain main rules which are met in the new commons
  - “Open commons”: digital, dynamic capacities
    - Decentralized and modular collaboration dynamic
    - Free entry/exit system
    - A system producing a non rivalrous resource
- Which do not exhaust the questions about what a digital commons is..
- What is “common” in the Digital commons?
  - The « collective good » turned into common good, then commons? (political studies)
    - Why not speaking of public good?
  - Or a new kind of (economics) commons?
    - New because of the goods? The organization? The incentives?

# Investing Digital (knowledge) commons

- Let's investigate what is behind the digital commons!



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# Starting for the actions, the activities to understand what happens

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Ostrom (2003, p. 248) :

- « The first attribute that scholars should examine is whether excluding beneficiaries requires high costs or only low costs. If exclusion is costly, potential beneficiaries face a collective action problem. Second, one needs to determine whether consumption is subtractive or not. Potential beneficiaries whose consumption is subtractive face a common-pool resource type of collective action problem. »
- « attributes of the goods produced and allocated, as well as the rules used for their production and allocation, affect the diverse incentives that participants face. »
- A double interrogation:
  - Existence of a shared, rare resource?
  - How people interact on this resource?
    - How the accesses to this resource are regulated

# Classic commons

- The management of a shared and rival resource:
  - The right to access it
  - The right for some to exploitation it
- The construction of a collective governance:
  - by several people,
  - creating coordination by rules negotiation
  - regarding the management
- based on the law, the custom, the technology, the internal regulation... and the physical-technological characteristics of the good
- Core of what interested Ostrom (an institutional economist)
- A specific Case of Olson's (1965) discussion of collective action (small groups & monitoring)

	Owners	Project Managers	Managers	Consumers
Access (to the fact that the good exists)	X	X	X	X
Action (which impacts the good: sample)	X	X	X	X
Action Management	X	X	X	
Consumer exclusion	X	X		
Access alienation capacity	X			

Bundles of rights, from Ostrom et Schlager (1996)

- Producers look for a **direct reward** from their participation / contribution (Sonali, 2006 ; Forte & Bruckman, 2008 ; Bateman et al. 2011)
  - Intellectual challenge,
  - access to easier publication, visibility through a platform
  - Orientation of the production (toward their vision of a fact, a knowledge)
  - feedback (access to experts)
- Over time, new benefits which encourage to stay (and to accept the rules)
  - Peer recognition, social status
  - Sometimes providing benefits on connected markets (job market)
- Coherent with the Auto-determination theory (Deci & Ryan, 2002)
  - **Autonomy, competency** (efficiency, mastering of a subject, exposition),  
**relationship to others**

# Digital commons: why & how to regulate participation?

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- A rare resource: contribution
  - The right to modify the knowledge base (article, software), to participate in the **knowledge flux management**
  - Rare because:
    - The existing **knowledge stock** & the contributing framework constrain what is possible to contribute
    - The expert, reviewer's time is limited
- Regulation, hierarchization through a modular organization
  - Sub-projects (article, module, themes in a forum) managed by a responsible/package manager/upstream
  - Regulation via the techno-structure, digital tools, bots
  - Rules discussion & negotiation by a sub-group of the contributors
- Which produces a public good (in the economics sense)
  - The **stock of knowledge**
  - Which has to evolve (to be managed), and which bounds the evolution

- The consumers (the contributors access to the knowledge flux)
  - Being able to act on the flux has a value
  - It is because one does, participates, that one can do and benefit from the collective action, especially when it relates to the management of a common digital resource.
  - it is not the ownership that confers rights of access and governance over a project, but activity, collective management.
- The users have access to the (knowledge) stock
  - As for a classic commons, they may enjoy it, not act on
  - Most of the studies (especially in law) discuss this stock only
  - Hence their difficulty to define the common resource
  - But this stock is just the public good, protected by the open licenses (CC, for instance)



# Digital commons: organizing the bundle of rights of access to the rare resource

- And again, a regulation by a bundle of rights
  - Built thanks to (IP) rights...
  - But also the usage (the rules) & the technology...

	Owner	Sub-Project manager Administrator	Moderator / article-package manager	Contributor	User
Access to the knowledge (stock)	X	X	X	X	X
Action on the knowledge (flux)	X	X	X	X	
Management of the contributions/actions	X	X	X		
Contributor exclusion power	X	X			
Capacity of alienating the access (brand, server, etc.)	X				

# Digital commons exist, they are:

- A collective management of a rare resource accessible to a small selected group
  - the access to contribution: contribution space & peers which evaluate it
- By a socio-technical systems which takes care of project's evolutions
  - knowledge flux organization, control, etc.
- Allowing a bigger group to benefit from the existence of the resource
  - the access to a knowledge stock

# What digital tells about commons



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- Digital facilitates the building of knowledge production projects (according to Marwell et Oliver's 1993 criteria) :
  - Incremental building & modularity (investment only on the element of interest and direct reward from the investment)
  - Facility to built groups of affinity (global recruitment)
  - Platform/IS which facilitates the management
- Private and human regulation:
  - More equipped than in classic commons
  - More opened, but with **more filters**:
    - **a priori**:
      - On the system technicality
      - On the knowledge production action capacities
      - => contributor auto-selection
    - **and a posteriori (new)**
      - Thanks to technical tools (bots, IS right management)
      - Because the action can be erased/reverted without consequences (for the knowledge stock & the project)

- Projects controlled by a single agent are not commons
  - Even if the production is open-sourced
- Commons are not the only collective management systems
  - Club good management (access to a non-rival, exclusive resource)
    - Sportive equipment, association
    - Easier exclusiveness
  - Digital club good also exist (Moodle)
- For a commons to exist, it must be:
  - **A rare resource accessible to a small selected group** (the access to contribution: contribution space & peers which evaluate it): a single contributor FLOSS projects is not a commons
  - **collectively managed:** Twitter is not a commons
  - **By a socio-technical systems which takes care of project's evolutions** (knowledge flux): an archive is not a commons
  - **Allowing a bigger group to benefit from the existence of the resource** (knowledge stock): a closed project is not a a commons

- Consequences?
  - shifting the cost of regulation onto the newcomers,
  - Producing effort to be evaluated ;
  - ( $\pm$  automatic) regulation by norm and rule:
    - possibility to learn these rules (explicit?)
    - & to test them several times
  - position is gained by reputation, more than by a priori competences (difference with classical epistemic communities)
- Again: The regulation of access to the rare resource is at the heart of the governance process
  - a construction that mixes law, contract, and organizational power
  - not fixed, permanent process of discussion through trials,
  - more uncertain boundaries, more changing groups

# The notion of “community”. Different roles, bundle of rights

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- Users
  - Access to the "public" resource
  - Law (license), but also policy and practice (open access journal, dissemination of "author" versions)
  - Legal structure is not disrupted
- Collectives
  - Contributors, who access a "private" resource
  - The more popular the project, the more competitive the access
  - Increased barriers to entry / Risk of exclusion of sub-population
- Community: the policy-makers
  - The ones that manage the socio-technical system
  - From the collective and/or the initiators of the project
  - The ones who say "we", the ones on the other side of the border
  - Paradox: the community is the **hierarchy**

# The notion of “community”. The definition does not creates or grants the position

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- Regulation that remains "organizational"
  - Discussion, mutual adjustment, implementation of rules in the IT/socio-technical system
  - Based on a posteriori control
  - Request for access, accepted or not
- Porous border between the different statuses
  - Need for permanent renewal
  - Rites of passage
  - Recognition by peers / democratic centralism



- Who can defend the common good?
  - The public good can be defended (license violation)
  - But need for an actor in capacity of defending it: person or institution...
- Should the commons, the system of production be defended?
  - From whom, by whom, and why?
  - Possibility of a "fork" that obliges to take into account the contributors
  - Questionable monopoly on the resource: "too big to fail" syndrome?
- Questions the role of these projects for our societies
  - What responsibility towards users?
  - Same type of responsibility as companies?
  - No legal entity? Often an association / foundation whose role it is. Who manages it?

# Commons Algorithmic Management

- Analyzing Wikipédia algorithmic governance
  - Does a commons manage AI better?
  - If Yes/No, why?
- To explore algorithmic/AI governance



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# Algorithmic management (AI)

- Not always efficient:
  - Over-standardization effects up to discrimination
  - Enforces the owners' power and control
  - Do not listen to users' need, difficulties, etc.
- Call for a better control of their use
  - At work
  - By the platforms
  - Data collected, algorithmic code...

See the special issue of the European Journal of Information Systems on that matter: Volume 31, Issue 3, and especially Kordzadeh, & Ghasemaghaei (2022), for a review of the literature and a discussion of that question.

# Algorithmic management (AI) “Failures”: not always intentional

- Failure in design & use:
  - two main human factors (Markus, 2017, p. 233)
    - complacency (e.g., over-reliance due to low level of suspicion),
    - bias (i.e., tendency to ascribe greater power and authority to automated aids over other sources of advice),
  - technico-organizational factor: the tool’s “managers” may not be the participants’ “managers”
- Call for the improvement of implementation practices (Mikalef et al. 2022)
- But few studies of platforms algorithmic management work (Möhlmann et al., 2021) => access to, the platforms’ regulation procedures, data, and codes...

# Open platforms Algorithmic management?

- Users managed platforms
  - Users mean contributors, of course
  - Less money oriented goals
- Do commons' algorithms take better decisions?
  - Less bias?
  - Less errors?
  - More flexibility, better, quicker matching to the uses?
- Information available
  - About the contribution
  - The algorithms implemented
  - Their consequences (their decision)

# Open platforms Algorithmic management of what?

- What is the resource that is managed?
  - cf. part 1: **contribution**
  - Quality, respect of the rules, law etc.
- Why algorithmic management?
  - Because of the project's success
  - Too many contributions for too few managers
    - A rare resource: manager (“patrollers”)
    - A lot of newcomers
    - A growing exposure which makes the project a target
      - Vandalism
      - Non adequate content

# Open platforms Algorithmic management How?

- “bots”
  - Programs, built by:
    - the platform owner (Wikimedia Foundation, US)
    - Local users (to help them in their tasks)
  - A lot!
    - 71 active bots in FR-Wikipédia at the time of study
  - For a long time
    - the platform has heavily relied on “bots”, to control what a person can or cannot do (Geiger 2011).

# A case study of the use and action of a bot

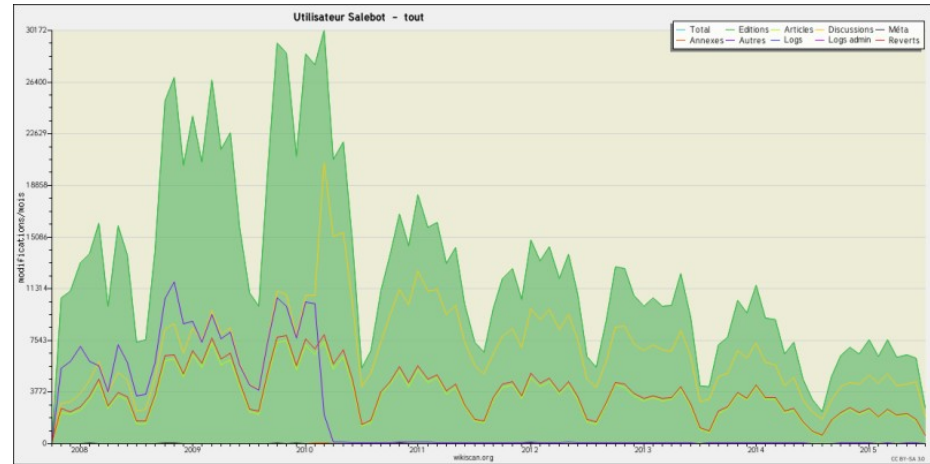
- Digital ethnography (Kozinets 2015)
- On the regulating activities, Algorithmically mediated
- Problems?
  - To whom?
    - Users,
    - Managers? Which managers?
  - How are they identified? Qualified?
  - How are they solved?
- Meet salebot: the naughty bot <https://fr.wikipedia.org/wiki/Utilisateur:Salebot>
- Vandal fighter: it eliminates contributions which are “measured” as vandalism (“revert”)



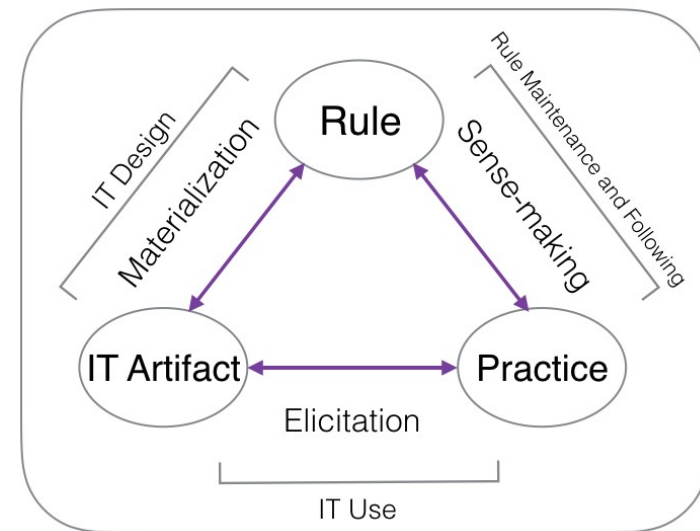


# Data collection: the life story of an object

- Of course:
  - The discourses about this object and its consequences
  - By humans
  - About rules, materialization, practices
- Challenge moments
- But also day-to-day management
  - Problems identified as so
  - But also “not a bug, a feature” moments



Salebot's activity (revert)



An IT-based regulation system (from de Vaujany et al. 2018, Figure 1, p. 16, reproduced with the authorization of the authors)

# Results (1): errors are inevitable

- errors or discrepancies occur... eventually
  - when taking into account new, original contributions, or unplanned actions

“I made errors from the start. One of the first was because a vandal had vandalized another vandal. I had not seen this coming and I had to revoke the second vandal’s version and return to that of the first. My trainer dealt with this problem.” Salebot’s life story, 2006 – 2007.

“In 2008, there was a person I systematically revoked when adding website addresses. My trainer had just added as revocable contributions sequences of more than 30 characters long with no spaces... My trainer [...] enabled me to locate the Web addresses.” Salebot’s life story, 2008.

- Users and goal change, not algorithms!
  - Another example: Deepl’s Italian “voi”

## Results (2): algorithmic control makes it hard to detect them

- Users have hard time identifying what's wrong
  - Did they do something wrong in good faith?
  - Did the control fail?
- Poor algorithmic justification, or understanding or the contributor's goal

“Now when we add contributions to articles under IP, we are directly reverted by Salebot for vandalism and warned that we are a malicious vandal. See what just happened to me: [...]” 83.195.83.236, 8 June 2008. The Bistro.

“You have discovered a vulnerability in Salebot. The reason for revocation, posted on your page, is “The detection included: 30 characters with no spaces.” [...] They are then logically cleared. There is no question of prohibiting publishing to IPs [...]” Serein, the same day.

- Also, where to go to complain?
  - Do you know the bistro? (French) or its Italian equivalent?
  - Even if everything is explained in the “how to contribute doc”

# Results (3): discrepancy is judged as an error if & only if policy makers say so

- The supervised must complain
  - For a discrepancy to be signaled
  - In the right spaces
  - And must prove that there is a problem/ s/he is right

**Blocked by Salebot**  
Hello i've just been blocked by salebot even though i've not vandalised anything (i've got a dynamic IP) so, without wishing to offend salebot, this is a violation of the first law of the robots: "A robot cannot undermine a human being, nor can it, by remaining passive, allow a human being to be exposed to danger" see box <http://fr.wikipedia.org/wiki/Utilisateur:Salebot> i am not in any way a vandal kind regards — The preceding unsigned message was left by Electrical fence (to discuss), June 28 2013 at 13:48.

[...]

Do you have any secondary sources to prove you are not a vandal? Please note that all editors, a fortiori with an IP, are automatically a suspect.[ref. necessary]  
Oblomov2 (d) 28 June 2013 at 17:38

- But only if the tenured participants say so...
- and if the bot owner acknowledges it:

"I made a bit of a mess yesterday with the "deletion of 30 characters without any spaces" rule ... I found that there were some URLs that were really 30 characters / digits long with no other symbols. Everything should be back to normal now. Sorry." Gribeco, same day, same space.

# Results (3): and the bots are at the policy makers' service

- Technical choice to consider Salebot as a human
  - No botflag anymore
    - As it made its modifications not visible by the patrollers
    - Thus they would go to a page already corrected
  - Consequences:
    - The fact that it is a bot is less clear
    - Newcomers have harder time to identify what happens, to whom complain
- Salebot not always “intelligent”, or “sensitive”, or welcoming

“Without having seen what it is about, I advocate not thinking twice about reverting Salebot, besides the fact that it is not really touchy [...], it should not be forgotten that it has a pointillist vision of the article, impressionist-like [...] Having to explain this to the author and replace Salebot's unpleasant message of Salebot with a welcome message is no laughing matter.” TigHervé (t)

- But it is useful, needed, and should be kept

# Results (4): relying of a bot is a socio-technical choice, other can have been made/ are made

- In other language projects, other bots
  - Less efficient, but with more room for human decision/interaction
  - AbuseFilter, created by the Wikimedia Foundation
    - it is often limited to flagging dubious edits and not to acting on the content (as Salebot did in its beginning),
    - cannot evolve autonomously (learn by itself).
- explanation (the Wikimedia Foundation & abuse filter advocate within Wikipédia policymakers):
  - more effective for the global project, because:
    - newcomers were needed to extend the coverage and the diversity of the contribution,
    - therefore of the contributors
    - Hence should be detected, helped, not reverted
  - even at the expense of an increase in controller workload.
- Used in Wikipédia as well, but only after the French project poli

# Consequences (1)

- Yet another platform?
  - AI/ algorithmic management reinforces the boundary between:
    - simple contributors
    - the policy-makers (« the community)
  - With the same difficulties to detect, qualify and correct discrepancies
    - Burden of the proof on the supervised
    - Overconfidence of the supervisor
    - Conformism reinforcement
  - But possibility to learn (trial and error),
    - no stigmatization (the digital anonymity)
- Similarity to private platforms
- And a necessity for the project to survive

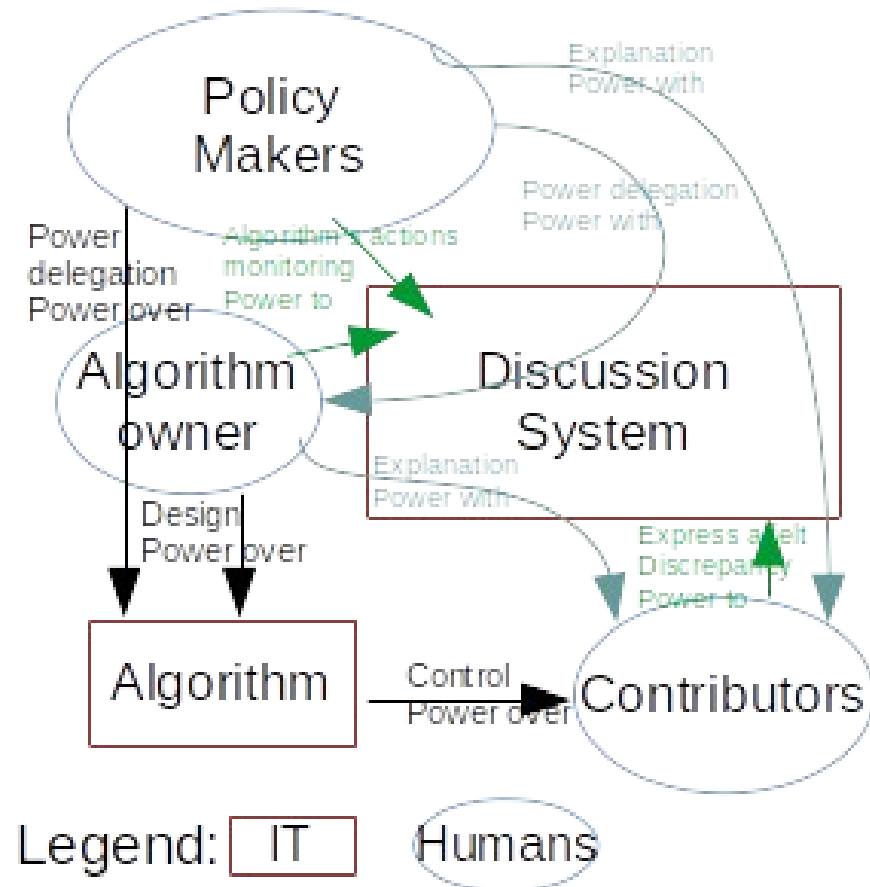
## Consequences (2)

- Feedback loop regarding regulation
  - Human discussion spaces
  - Collective regulation and governance collective (“policy makers”)
- To which (any)one can access
- Digital common’s key element of differentiation
  - Even for the algorithmic management governance
  - Open feedback loop



# Conclusion: Commons Algorithmic Governance, the Wikipédia case

- Two spaces:
  - Creation, knowledge production
    - Rules enforcement, quality governance,
    - image of the project
    - Power over
  - Project management
    - Managing the unexpected
    - Creativity, power with
    - Always evolving
      - New goals
      - Society evolution
- The algorithms:
  - Allow for the surviving of the two spaces
    - Raising the boundaries
    - Maintaining their porosity
  - Discursive control, constant negotiation of their power and their creators' power





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**Thank you for your attention...**

**And your questions!**

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