

# Forking as Cultural Practice: Institutional Governance after the DAO

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## Abstract

Since the microcomputing revolution in the 1970s we live in the age of permanent (technological) disruptions, but institutional and educational practices have barely changed. “Technologies come and go but the university remains, in a recognizable and largely unchanged form” (Flavin, 2017). Disruptive technologies, such as distributed consensus systems (blockchains, DLTs) challenge the role of the university as gatekeeper to knowledge and question the structure and organisational architecture of institutions. The only chance for traditional institutions is to find interfaces to informal and technology-driven “production cultures” (Tarasiewicz, 2011) to be able to radically reinvent the university. If the universities don’t react to technological and societal change, they will be forked, replaced, and decentralized.

## Keywords

Bitcoin, Blockchain, Code Governance, Code Politics, Coded Cultures, Consensus, Cryptography, Cryptopolitics, Cypher-punks, DAO, Disruption, Distributed Autonomous Organisations, Ethereum, Forking, Governance, Hacker Culture, Innovation.

## Introduction

With the accelerated pace of the introduction of new technologies, the appropriation of techno-culture has targeted all niches of informal work. Terms such as “Hackerspaces” and “Hackathons” show that the terminology “hacker” and “maker” has been commodified (Davies, 2017). In recent years, informal cultures of knowledge production are actively targeted and their methods and formats are emulated and transported into business and education. The hacker ethic, as Brett Scott points out, is a composite of “not merely exploratory curiosity or rebellious deviance or creative innovation within incumbent systems. It emerges from the intersection of all three” (Scott, 2015). Numerous incompatibilities question the interfaces between informal and ‘formal’ research (Wagner, Newman & Tarasiewicz 2015). In the new age of permanent disruption “it is not assets we need to leverage, but networks” (Satell, 2013).

## Disruption and University

A “disruptive innovation” (Bower & Christensen, 1995) is said to create a new market and value network (or disrupt existing ones), with “significant societal impact” (Assink, 2006). Hypes and hype-cycles are evolving, while at the same “tethered appliances” (Zittrain, 2008) are consequently “reducing the potential for technological literacy” (Wuschitz et al., 2016). Institutions as tethered appliances introduce limitations, and have been re-invented (Johnson et al., 1995), hacked (Cohen and Scheinfeldt, 2013) and rebooted (Berechet and Istrimschi, 2014), while still being in its permanent crisis (Nelson, 1997; Scheper-Hughes, 2011; McCabe, 2013).

Although there are many ongoing attempts to implement novel and “disruptive” technologies into teaching and learning practices, traditional institutional practices have barely changed (Blin and Munro, 2008; Christensen et al., 2011). “Teachers have implemented computers in the most commonsense way – to sustain their existing practices and pedagogies rather than to displace them” (Christensen et al, 2011). As Michael Flavin notes, “technologies come and go but the university remains, in a recognizable and largely unchanged form” and “the use of disruptive technologies challenges the role of the university as gatekeeper to knowledge and signifies the possibility of a more open borders approach.” (Flavin, 2017).

## The Age of Permanent Disruption: from the ‘Crypto Dream’ to the ‘Blockchain Revolution’

...disruptive innovation does not take root through a direct attack on the existing system. Instead, it must go around and underneath the system” (Christensen et al, 2011)

Simon Penny describes how cultural production and innovation always involves diverse communities of toolmakers, and their “particular contributions and motivations are seldom noted, except in specialised studies” (Penny, 2008). Often such cultures, are, as Penny

calls them, “renegades” or “eccentrics”, producing their tools outside of institutions and “by definition, ahead of the technological- industrial curve” (Penny, 2008). One example of such an eccentric innovative technology-based community are the cypher-punks.

In 1983 cypherpunks already debated the usage of digital cash without a central issuing authority (Chaum, 1983, 1990; Finney, 1993; Medvinsky and Neuman, 1993; May, 1994; Szabo, 1997; Dai, 1998; Reagle, 2005), which was only introduced in 2008 by the anonymous entity ‘Satoshi Nakamoto’ (Nakamoto, 2008). Within a self-published paper Nakamoto described the blockchain ledger, thus inventing the first crypto-currency: Bitcoin. Digital currency and even more so the ‘blockchain’ might be the most disruptive invention since the internet, though its ‘disruptiveness’ is still debated (Iansiti & Lakhani, 2017; Swan, 2015; and others). Originally interpreted as a critique to the bank bailouts after the financial crisis (en.bitcoin.it, 2017) and used only by a few, together with existing other so called “altcoins” (Tarasiewicz & Newman, 2015), the market capitalization of digital currencies nears \$27.85 bln as of 04/2017 (Suberg, 2017).

Blockchains have a multitude of potential applications and the industry is “imagining a blockchain world” (Ernst & Young, 2016), but we have to still read them as experimental technologies. They are “distributed community experiments” tackling evolving problems that emerged throughout the various phases of adaptation and collective learning processes (Tarasiewicz & Newman, 2015). Traditionally designed institutions are trying to react to the massive technological and societal change disruptive technologies introduce, but the underlying own governance models and decision making protocols are rarely questioned.

### Code Governance and Fork Politics

“Generally, no leaderless developers have ever written big and complex software. It is unheard of. Whether that shows that people cannot or prefer not to do it, is unclear”. (Meatballwiki, 2010)

Conflicts appear in coding communities on a regular basis, protocols for resolution have to exist in order to continue development. A “Fork” in software engineering describes the situation, when developers create their own “branch” and start individual development on it. “The right to fork is inherent in the [fundamental software freedoms] common” and “also takes place

in non-profit associations and political and religious movements”. Participants of the social system of software projects can utilise their “right to fork” as well as their “right to leave” (Meatballwiki, 2010). Software repositories are usually governed through “benevolent dictators”, in contrast to “management committees of meritocratic projects” (Gardler & Hanganu, 2010). But the introduction of the blockchain (Nakamoto, 2008) introduced numerous new governance models, which are based on experimental “cryptoeconomic” settings (Zamfir, 2014) and are tested by numerous initiatives in experimental way. As De Filippi notes, this had been already achieved through the automation to decision-making processes, the incorporation of legal rules into code and more recently through the “code-ification of law” (De Filippi, 2016).

Flattening organisational structures (to emulate and mimic development and production cultures) is experimented upon in technology-based companies for a longer time already, *Holacracy* for example, is a system of organisational governance developed by the company HolacracyOne. Its’ claims are to “[turn] everyone into a leader” and goes on explaining “this isn’t anarchy – it’s quite the opposite” (Robertson, 2015).

Critique of the system is manifold - Bernstein et al. describe “old power rules can be deeply embedded in culture and institutions”, so a transition from an existing (hierarchical) governance model to self-governed one appears problematic (Bernstein et al., 2016). Other examples are “liquid democracy” or “delegative democracy” (most prominently used by the German pirate party), where an electorate vests voting power in delegates rather than representatives (Ford, 2002).

*Futarchy* describes a form of governance proposed by economist Robin Hanson (2007). He criticises, that democracies “fail largely by not aggregating available information” and that “betting markets are our best known institution for aggregating information”. Under futarchy, users would “vote values, but bet beliefs” (Hanson, 2007). Voting would not be to implement particular policies, but on metrics to determine how well their organisation/institution is doing, and prediction markets would be used to pick the policies that best optimize the metric. In a binary (yes/no) vote on a specific topic, two prediction markets would emerge, and on resolution, all trades on the rejection market would be reverted. Vitalik Buterin (co-founder of the Ethereum ‘world computer’) in 2014 described a

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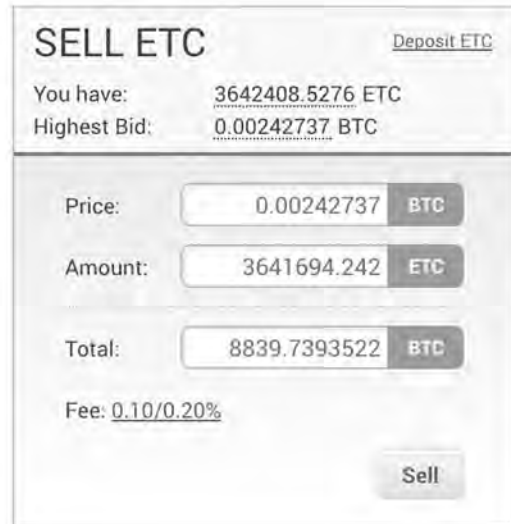
decentralized autonomous organization (DAO) using futarchy to govern a (fictional) nation. “DAOs allow us to very quickly prototype and experiment with an aspect of our social interactions that is so far arguably falling behind our rapid advancements in information and social technology else-where: organizational governance” (Buterin, 2014).

The Ethereum project had to face a “hard fork” on the network in 2016, resulting in two different blockchains: ‘Ethereum’ and ‘Ethereum Classic’ as philosophical differences between “radical crypto-decentralists” and “bailout supporters” of the first decentralized autonomous organisation emerged (Widrum, 2016). *The DAO* was to this date an investor -directed, stateless venture capital fund, with the largest crowdfunding campaign in history with over \$168 million in available (crypto) funds (Metz, 2016). After hackers exploited a vulnerability in the DAO code, and a third of the collected funds have been moved away, the original proclamation of Ethereum’s “unstoppa-ble code” and “by -laws [which] are immutably chiseled into the Ethereum blockchain” (Cryptohustle, 2016) has been questioned. The community decided to block the ‘stolen’ funds through a hard-fork of Ethereum, a modification of the underlying code.

## Conclusion

De Filippi and Loveluck in their 2016 paper differentiate between “governance by the infrastructure (achieved via the Bitcoin protocol)” and “governance of the infrastructure (managed by the community of developers and other stakeholders)”. It would be more interesting not to use the blockchain as a “regulatory technology” enforcing a particular set of predefined protocols and rules (Bitcoin), but as a “platform on which people might encode their own sets of rules and procedures that will define a particular system of governance” (De Filippi and Loveluck, 2016). For ‘new’ and ‘old’ institutions alike, governance models based on distributed consensus and cryptoeconomics offer a significant opportunity for implementing change to react to technological and societal developments. The preconditions for such a model are not only technological, as governance in cryptocurrencies relates to decisions about the “rules of the protocol (the code) and the incentives the network is based on (the economics)” (Tomaino, 2017). There is a strong need for a form of ‘blockchain literacy’, but more importantly there must be a strong emphasis on the

interaction and communication between both institutions and informal coding communities to further the research into and development of new amalgamations of social and organisational structures. Otherwise everything is ‘forked’.



The image shows a screenshot of a 'SELL ETC' interface. At the top, it says 'SELL ETC' and 'Deposit ETC'. Below that, it displays 'You have: 3642408.5276 ETC' and 'Highest Bid: 0.00242737 BTC'. There are three input fields: 'Price' with the value '0.00242737 BTC', 'Amount' with the value '3641694.242 ETC', and 'Total' with the value '8839.7393522 BTC'. A 'Fee' is listed as '0.10/0.20%'. A 'Sell' button is located at the bottom right.

Artistic Bokeh (2016). *Pittoresque Poloniex* (Sep 05 2016) 61908b82e19911e780ec9836635dc92ce7444a97f6af8 316d55850650

## References

- Berechet, D. and Istrimschi, P. (2010). *Education Reboot: Reinventing the University*. Procedia - Social and Behavioral Sciences. Volume 142, 14 August 2014, Pages 755-761. <http://www.sciencedirect.com/science/article/pii/S187704281404539X>
- Bernstein, E., Bunch J, Canner, N. and Lee, M. (2016). *Beyond the Holacracy Hype*. Harvard Business Review, July-August 2016. Retrieved from <https://hbr.org/2016/07/beyond-the-holacracy-hype>
- Blin, F. and Munro, M. (2008) *Why hasn't technology disrupted academics' teaching practices? Understanding resistance to change through the lens of activity theory*, Computers and Education, vol. 50, pp. 475-490.
- Bower ,J. ,Christensen, M. (1995). *Disruptive Technologies: Catch-ing the Wave*. Harvard Business Review, January-February 1995.

- Buterin, V. (2014). *An Introduction to Futarchy*. Retrieved from <https://blog.ethereum.org/2014/08/21/introduction-futarchy>
- Chaum, D. (1983). Blind signatures for untraceable payments. In D. Chaum, R. L. Rivest, & A. T. Sherman (Eds.), *Advances in cryptology: Proceedings of crypto 82* (pp. 199-203). New York: Plenum Press.
- Chaum, D., Fiat, A., Naor, M. (1990) *Untraceable electronic cash*. Lecture Notes in Computer Science: Proceedings on Advances in cryptology. In: CRYPTO '88, (Vol. 403 pp. 319-327). Berlin: Springer.
- Christensen, C. M., Horn, M. B., and Johnson, C. W. (2011) *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*, New York, McGraw Hill.
- Cohen, D. and Scheinfeldt, T. (2013). *Hacking the Academy: New Approaches to Scholarship and Teaching from Digital Humanities*. Ann Arbor, MI: University of Michigan Press. Retrieved from <http://hackingtheacademy.org/>
- Cryptohustle (2016). 5 reasons why the DAO bailout was bad for Ethereum. Retrieved from <https://cryptohustle.com/5-reasonswhy-the-dao-bailout-was-bad-for-ethereum>
- Dai, W. (1998) B-Money. Retrieved from <http://www.weidai.com/bmoney.txt>
- Davies, R. (2017). *Hackerspaces: Making the Maker Movement*. Cambridge: Polity Press.
- De Filippi, P. (2016). Blockchain technology as regulatory technology: From code is law to law is code. *First Monday*, Volume 21, Number 12 - 5 December 2016.\*
- De Filippi, P. & Loveluck, B. (2016). The invisible politics of Bitcoin: governance crisis of a decentralised infrastructure. *Internet Policy Review*, 5(3). [en.bitcoin.it](http://en.bitcoin.it), (2017). *Genesis Block*. [bitcoinwiki](http://en.bitcoin.it/wiki/Genesis_block). Retrieved from [http://en.bitcoin.it/wiki/Genesis\\_block](http://en.bitcoin.it/wiki/Genesis_block)
- Ernst & Young (2016). *Blockchain reaction: Tech plans for critical mass. Report 2016*. Retrieved from [http://www.ey.com/Publication/vwLUAssets/ey-blockchainreaction-tech-companies-plan-for-critical-mass/\\$FILE/eyblockchain-reaction.pdf](http://www.ey.com/Publication/vwLUAssets/ey-blockchainreaction-tech-companies-plan-for-critical-mass/$FILE/eyblockchain-reaction.pdf)
- Finney, H. (1993). *Detecting Double-Spending*. Retrieved from <http://www.finney.org/~hal/chcash2>
- Flavin, M. (2017). *Disruptive Technology Enhanced Learning - The Use and Misuse of Digital Technologies in Higher Education*. London: Palgrave Macmillan.
- Ford, B. (2002). *Delegative Democracy*. Retrieved from <http://www.brynosaurus.com/deleg/deleg.pdf>
- Gardler, R. and Hanganu, G. (2010). *Benevolent Dictator Governance Model*. OSS Watch. Retrieved from <http://osswatch.ac.uk/resources/benevolentdictatorgovernancemodel>
- Hanson, R. (2007). *Shall We Vote on Values, But Bet on Beliefs?* Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.71.8309>
- Hemetsberger, A. and Reinhardt, C. (2006). *Learning and Knowledge-building in Open-source Communities - A Socialexperiential Approach*. *Management Learning. The Journal for Critical, Reflexive Scholarship on Organization and Learning*, Vol 37, Issue 2. <https://doi.org/10.1177/1350507606063442>
- Iansiti, M. and Lakhani, K. (2017). *The Truth About Blockchain*. *Harvard Business Review* January-February 2017. Retrieved from <http://hbr.org/2017/01/the-truth-about-blockchain>
- Johnson, L., Rush, S. and Coopers & Lybrand LLP (1995). *Reinventing the University: Managing and Financing Institutions of Higher Education*. Wiley.
- May, C. (1994) *Cyphernomicon*. Retrieved from <https://www.cypherpunks.to/faq/cyphernomicon/cyphernomicon.html>
- McCabe, C. (2013). *Publish or perish: Academic publishing confronts its digital future*. Retrieved from <http://hub.jhu.edu/magazine/2013/fall/future-of-academicpublishing/>
- Meatballwiki (2010). *RightToFork*. [meatballwiki.com](http://meatballwiki.org/wiki/RightToFork). Retrieved from <http://meatballwiki.org/wiki/RightToFork>
- Medvinsky, G. and Neuman, B. (1993). *NetCash: A design for practical electronic currency on the Internet*. Retrieved from [http://clifford.neuman.name/papers/pdf/9311\\_netcashmedvinsky-neuman-cccs93.pdf](http://clifford.neuman.name/papers/pdf/9311_netcashmedvinsky-neuman-cccs93.pdf)
- Metz, C. (2016). *The biggest crowdfunding project ever - The DAO - is kind of a mess*. *Wired*. Retrieved from <https://www.wired.com/2016/06/biggest-crowdfunding-project-ever-dao-mess/>
- Nelson, C. (1997). *Will Teach for Food: Academic Labor in Crisis*. University of Minnesota Press.
- Penny, S. (2008). *Bridging Two Cultures: Toward an Interdisciplinary History of the Artist-Inventor and*

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- the Machine-Artwork, in Dieter Daniels and Barbara U. Schmidt (eds.), *Artists as Inventors- Inventors as Artists* (Ostfildern, Germany: Hatje Kantz Verlag, 2008), pp. 55-69.
- Reagle, Joseph M. (2005). *Trust in Electronic Markets - The Convergence of Cryptographers and Economists*. First Monday Special Issue #3: Internet banking, e-money, and Internet gift economies. Retrieved from <http://firstmonday.org/ojs/index.php/fm/article/view/1509/1424>
- Robertson, B. (2015). *Holacracy: The New Management System for a Rapidly Changing World*. Henry Holt and Co.
- Satell, G. (2016). *These 4 Major Paradigm Shifts Will Transform the Future of Technology*. Forbes Magazine. Retrieved from <https://www.forbes.com/sites/gregsatell/2016/05/15/these-4-major-paradigm-shifts-will-transform-the-future-of-technology>
- Satell, G. (2013). *A New Age of Disruption*. Digital Tonto. Retrieved from <http://www.digitaltonto.com/2013/a-new-age-of-disruption/>
- Scheper-Hughes, N. (2011). *The Crisis of the Public University*. <http://www.chronicle.com/article/The-Crisis-of-the-Public/130135>
- Scott, B. (2015). *The hacker hacked*. aeon magazine. <https://aeon.co/essays/how-yuppies-hacked-the-original-hackerethos> Retrieved March 28, 2017.
- Suberg, W. (2017). *Cross-Crypto Market Cap Reaches New All-Time High Due to Altcoin Upheaval*. Retrieved from <https://cointelegraph.com/news/cross-crypto-market-capreaches-new-all-time-high-due-to-altcoin-upheaval>
- Swan, M. (2015). *Blockchain: Blueprint for a New Economy*. O'Reilly Media.
- Szabo, N. (1997). *Formalizing and securing relationships on public networks*. First Monday, 2(9). Retrieved from <http://szabo.best.vwh.net/formalize.html>
- Tarasiewicz, M. (2011). *Coded Cultures Between New Media Arts and Production Cultures*. Coded Cultures: New Creative Practices out of Diversity. Vienna/NY: Edition Angewandte and Edition Transfer. <http://fs3.at/a/us/3709104572>
- Tarasiewicz, M. and Newman, A. (2013). *Experimental cultures and epistemic spaces in artistic research*. Handbook of Digital Currency. Singapore: Elsevier.
- Tarasiewicz, M. and Newman, A. (2015). *Cryptocurrencies as distributed community experiments*. Proceedings of the 19th International Symposium on Electronic Art, ISEA2013, Sydney ISEA International, Australian Network for Art & Technology, University of Sydney. [https://www.academia.edu/5547302/Experimental\\_cultures\\_and\\_epistemic\\_spaces\\_in\\_artistic\\_research](https://www.academia.edu/5547302/Experimental_cultures_and_epistemic_spaces_in_artistic_research)
- Tomaino, N. (2017). *The Governance of Blockchains*. Retrieved from <https://thecontrol.co/the-governance-of-blockchains-5ba17a4f5da6>
- Wagner, S., Newman, A. and Tarasiewicz, M. (2015). *Epistemic practices in arts and technology*. Journal for Research Cultures, Issue 1. Vienna: Research Institute for Arts and Technology. ISSN 2411-3751 <https://researchcultures.com/issues/1/editorial.html>
- Widrum, A. (2016). *Rejecting Today's Hard Fork, the Ethereum Classic Project Continues on the Original Chain: Here's Why*. Bitcoin Magazine. <https://bitcoinmagazine.com/articles/rejectingtoday-s-hard-fork-the-ethereum-classic-project-continues-on-theoriginal-chain-here-s-why-1469038808/> Retrieved March 28, 2017.
- Wuschitz, S., Wagner, S., Newman, A. and Tarasiewicz, M. [Eds.](2016). *Openism: Conversations in Open Hardware*. Vienna: Edition Angewandte.
- Zamfir, V. (2014). *Towards a general theory of cryptoeconomics*. Talk at the Centre Of Mathematical Sciences, University Of Cambridge.
- Zittrain, J. (2008). *The Future of the Internet and How to Stop It*. New Haven & London: Yale University Press. Retrieved from <http://nrs.harvard.edu/urn-3:HUL.InstRepos:4455262>

## Author Biography

Matthias Tarasiewicz is active as curator, researcher and technology theorist since the last millennium. He co-founded Coded Cultures (media arts festival and research platform) and is deeply involved in coding and decoding (both literally and theoretically). He researches in the fields of artistic technology, experimental documentation and cryptocurrencies. His work BitCoincloud received various prizes and has been shown internationally since 2010. He is part of the group 'Artistic Bokeh' and was coordinator for research projects such as 'AXIOM - Open Source Cinema' (EU Horizon2020), Artistic Technology Research (FWF PEEK), etc. He currently works as Board chair for the Research Institute for Arts and Technology, as Editor of the Journal for Research Cultures and as researcher and consultant for numerous

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