

Project Proposal

Decentralization for a stronger democracy

by

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Abstract

Big technology companies form an oligarchy of rentiers as a result of platform capitalism, competing for markets instead of conventional internal market competition. In the digital infrastructure sector competing standards are erected, and most or all of the market will adopt this standard. Erecting a competing standard is very costly and either very or not profitable, limiting the feasibility of competing. These standards are rented out to the rest of the economy, combined with the size of these standards; this is an impediment to the economy as no capital is generated for the rest of the economy. Intellectual property is built with this money and rented out, cementing the powerful position of big technology. Assuming that the lack of competition in the internal market results in a higher cost and lower quality, the market mechanics of the digital infrastructure sector come at a premium to society: The Wasted Oligarchy Premium for Digital Infrastructure (WOPDI).

Decentralised governance of the digital infrastructure sector enabled by blockchain technology might be the answer to this problem. There has been significant progress in the field of decentralised governance enabled by blockchain technology, but there remains a big disconnect between conventional governance and decentralised governance. This is why the following research question was formulated: *What is the potential of blockchain technology enabled decentralised governance to change the nature of the market in the digital industry from competition-for-market to competition-in-market?*

To answer this question, a comparison should be made between a conventional and decentralised implementation of digital infrastructure, a mixed-methods case study is proposed. Potential can be determined with an estimate of the impact and an evaluation of feasibility. It is proposed to do this by estimation of the WOPDI, by comparing the costs for conventional and decentralised infrastructure using cost-benefit analysis and evaluation of feasibility using comparative cognitive mapping, using the case of Music DAO, in the music streaming industry.

Answering the main research question by comparing a carefully selected centralised counterpart of Music Dao to Music DAO. Evaluating when Music DAO can be considered operational. The cost difference for the economy, were Music DAO used instead of its centralised counterpart. What the driving factors are behind the market position of Music DAO. What measures decision makers might take to better Music DAO's market position. And finally, addressing the knowledge gap more directly with an evaluation of the differences and similarities between Music DAO and its centralised counterpart in terms of governance and power balance.

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Introduction: problem and knowledge gap

"Capitalism is dead, and it is replaced by something worse: Technofeudalism", says Yanis Varoufakis, promoting his new book on the role of big technology in the economy (Cadwalladr, 2023). As both the European Union and the US are legislating against gatekeepers in digital markets (Nadler, 2022 and EU Commission, 2022). The power of big technology has become intense. The problem becomes clearer when we look at the economics of platforms.

1.1. Platform economics

Big tech companies such as Microsoft, Google, Amazon, Meta (Facebook) and Apple earn their money by renting out intellectual property, targeted advertising space, or infrastructure (computer hardware). This means that these companies do not produce capital that can be accumulated for other parties in the economy. This is more so a problem due to the size of these companies. The size and growth of this sector is an impediment to the economy as a whole, since we all pay rents for intellectual property, advertising space, and infrastructure; less money is left to pay for production of goods (Srniczek, 2021). This on its own does not make for a big problem yet, as we all enjoy these services, why would it be a problem to pay for these rents? It becomes a problem when the rent price is not reasonable and it is not feasible to rent from another provider. Then we are stuck with an unreasonable high cost that we have to pay.

1.2. Competing *for* markets (not *in* markets)

Srniczek (2021) also mentions that these companies are predominantly monopolists. This follows from the nature of the market in which they operate. The assets developed by big technology companies are extremely expensive to build and are essentially a standard on their own, because there is little incentive to make these assets interoperable, as that enables potential customers not to rent the newly developed asset. Because these assets are developed to be standards, the competition becomes very ruthless, as the winner literally takes it all. This is not what we normally think about when we think about competition. Normally, we think of buying one type of asset from one company over the other company because of some competitive advantage the first company has in providing a better product. That is not how companies compete in the digital sector. They compete by erecting competing standards. Customers choose a standard, and customers are locked in. leaving the competing standard with very little or no profit, making it infeasible to keep supporting a competing standard. This ruthlessness creates an industry where the best standard is adopted, and other standards perish, a monopoly. Moreover, to achieve the best standard, you need the most investment, and it will only be feasible to have a good return on investment if a new standard is erected. This large investment need works monopolisingly. The company that erects a standard will be able to raise the money necessary to establish the next standard; other companies cannot (Srniczek, 2021 and Geroski, 2003). This is why big technology companies can lock the economy into its erected standards, making for an unreasonably high cost and it being infeasible to switch to another provider as a consumer.

1.3. The wasted oligarchy premium for digital infrastructure

Assuming that the lack of competition in the internal market will result in higher prices and lower quality: Society pays a Wasted Oligarchy Premium for its Digital Infrastructure (WOPDI) for products and/or services due to the lock-in mechanism created by the competition-for-markets (CFM) nature of digital markets. This premium is paid for products or services provided by a CFM digital infrastructure market and is equal to the difference between the price paid and the price paid if the same product or service was provided by a market that has a competition-in-markets (CIM) nature. This is not an easy metric to calculate, but it is important to establish that society pays a premium because of the market mechanics in our digital sector. While keeping in mind that the premium does not go toward the purchase of capital that will remain in society, it is wasted. The WOPDI goes toward further cementing the powerful position of the digital infrastructure oligarchy.

1.4. Societal relevance: reducing the amount of WOPDI paid

Besides legislating against gatekeepers it might be possible to work on this problem by creating decentralised standards. In this way a CFM natured market might start behaving in a CIM manner. As more local decentralised parties can compete with each other. This way the amount of WOPDI paid by society can arguably be brought down to zero. Lowering the amount of money spend on non-capital creating processes and saving consumers money.

1.5. Relevance to the Engineering and Policy Analysis masters programme

This thesis is relevant for the engineering and policy analysis master's programme as it considers a complex sociotechnological environment that is the digital industry. Accounting for the different actors and their incentives by approaching the problem as a multi-actor problem. Consumers want a nice customer experience, the government wants to keep the economy healthy and thus minimise the amount of WOPDI paid in the economy, and producers of intellectual property still want to earn a fair wage in a liberal market system.

This thesis proposal will first further address the current state-of-the-art in this area. Then the approach is chosen, followed by the planning.

Research question - Literature review

In this section a literature review is conducted to demarcate what we currently know, what we do not know, and what we would like to know; "The state of the art". To formulate a relevant research question.

2.1. Decentralisation

Blockchain based decentralisation of the governance of a market might be possible. Blockchain technology can be the next historic step in decentralisation. Decentralisation is a general method that has been used over the course of history to improve systems. A famous example of decentralisation is the separation of powers, or "trias politica". Separating legislative, executive, and judicial powers, rather than centralising them into one. Or, take, for example, the democratic model. Blockchain technology offers opportunities in this regard. Using blockchain technology, one can rely on a network rather than a central authority (Poltorak, 2021 and Atzori, 2015). Which might lead to a myriad of system improvements (Ølnes et al., 2017). For example, avoiding fraud and manipulation, reducing corruption, transparency and audit-ability, privacy, reduced costs, etc.

2.2. Literature finding

Google scholar was chosen for the search engine and the search string "blockchain technology decentralised governance" was crafted by iteratively improving the search string until the most relevant literature to the topic popped up; there were 46.400 results, which was considered a good number of results as the topic is still not very specific. The 10 most relevant articles were chosen for review, ignoring duplicate results and relying on the relevance sorting option Google Scholar offers.

2.3. Results

As all literature uses blockchain technology to decentralise governance, the decentralisation of governance enabled by blockchain technology is abbreviated as Blockchain enabled Governance (BeG).

The literature shows some earlier controversy, and then a more constructive direction, concluding in a further research suggestion.

Chronologically, the literature is initially about the potential boons and dooms to society that BeG poses. Blockchain applications are assessed from a political perspective (Atzori, 2015), BeG is seen as a force that challenges traditional mechanisms of state authority, citizenship, and democracy. And the analysis to what extent BeG tools can be considered hyper-political tools and advocates the role of the state as a necessary central point of coordination in society. New modes of governance based on blockchain technology are examined with the assumption that blockchain technology will replace traditional authority roles (Reijers et al., 2016). In the literature, a progression of understanding is apparent over time.

Later, literature is more concise, to the point, and unafraid of what was "the unknown" before. Centralised firms can be outcompeted and bad equilibria can be avoided using "soft decentralised governance" with the notion that smart contracts cannot be complete without a traditional authority (De Filippi, 2019). The need for governance in the digital realm is underpinned by the notion of shortcomings of current modes of governance, and a novel conception of governance is invented by combining literature on governance with social network theory literature; "decentralised networked regulation" (Zwitter and Hazenberg, 2020).

After this progression there is some divide in the literature that can be characterised with "dreamers" and "doomers".

The great potential in BeG also poses great danger. A new subset of law is explored as blockchain technology is predicted to shift power away from centralised authorities (De Filippi and Lavayssiere, 2020). The large economies that thrive in autonomous decentralised organisations are comparatively analysed (Faqir-Rhazoui et al., 2021). With the earlier political level literature in mind, there seems to be conflict of interest between BeG involved parties. Underneath the dreamer and doomer composure there are anarchist and criminal motivations versus regulatory and citizenship motivations. A more constructive composure is represented by (Zwitter and Hazenberg, 2020). The BeG topic seems to grow out of dreamer-versus-doomer debate and take on a more constructive composure.

The underlying problems or issues with BeG are being addressed. Platform governance structures are analysed in the sense of decentralised, semi-decentralised, and centralised structures (Chen et al., 2021), this can be seen as a continuation of the need of (De Filippi, 2019) for "soft decentralised governance". More complex decentralised governance is theorised with new forms of decentralised participative governance models (Zutshi et al., 2021). And finally, insights are integrated of recent literature on this topic, concluding that future research should investigate smart contract governance of blockchain applications and infrastructure using decision making tools and spatial cognition algorithms (Balcerzak et al., 2022).

2.4. Formulating the research question

There is substantial perceived potential in BeG in most of the literature found. A novel mode of governance was theorised by Zwitter and Hazenberg (2020). The degree to which governance should be decentralised to avoid bad equilibria has been observed and researched (De Filippi, 2019 and Chen et al., 2021). The feasibility of participative governance models is theorised Zutshi et al. (2021). And a synthesis of a larger body of literature resulting in a comprehensive overview was made (Balcerzak et al., 2022). The current knowledge gap seems to lie between conventional governance and decentralised governance. It is not clear what the potential benefits or disadvantages are when deciding to adopt decentralised governance. Combining this gap with the identified problem, the following research question can be formulated:

What is the potential of blockchain technology enabled decentralised governance to change the nature of the market in the digital industry from competition-for-market to competition-in-market?

If answered, this will further the understanding of what BeG can be used for.

Approach: Mixed methods

In this chapter, the approach of the research is addressed. The steps that are taken to reach an answer to the main question are expressed. The questions that will be answered in the process are highlighted and a reflexion is made on the general composure of this research. Finally, the limitations to the approach are discussed.

3.1. Case study: Music DAO, Meritrunk

This problem has already been potentially solved in a technical fashion for the specific case of the digital infrastructure for the music industry, for streaming music. Music DAO in its latest version developed by Planje (2023), if combined with Meritrunk developed by Nasrulin et al. (2022) has the potential to meet the needs of consumers and musicians and pay for software development. And intuitively, Music DAO needs only a fraction of the capital that a similar digital infrastructure like Spotify, Youtube Music, Tidal, or Apple music would need to provide the users of the platform with what they want.

Music DAO has the potential to do this because it is a Decentralised Autonomous Organisation (DAO). A DAO is made up of its users; it is not an application that is developed and owned by a company. The contribution of the users gives them voting rights through the Meritrunk algorithm (so again no supervision necessary), isolating selfish and/or malicious users into powerless exile. While not giving more wealthy users more voting power than a regular contributing user. This seriously questions whether it is necessary to have centralised authorities to execute governance for the music streaming market.

This can create a market where anyone can offer to contribute and the best contribution can be chosen using a cryptographic voting mechanic, creating a CIM-natured market where there was a CFM-natured market. This makes it possible to estimate the WOPDI in the case of music streaming and also estimate the added value that adopting decentralised governance brings in this case.

In addition to the voting mechanism, if the protocols used are documented well enough and available, anyone can create their own implementation of these protocols and have the software work in a compatible fashion. People can decide to join the ecosystem without breaking laws on intellectual property. In Music DAO's case, these protocols are public knowledge and freely available on Github as the development was part of government funded research.

3.2. Mixed methods

Assessing the potential of Music DAO to change the nature of the music streaming market from CFM to CIM while estimating the WOPDI society pays for music streaming, a careful comparison should be made between an operational version of Music DAO as an example of a market of CIM-nature and a centralised counterpart in the current market of CFM-nature. This should be done using cost-benefit analysis (CBA).

After all the caveats are clear between the two, the feasibility can be assessed. To assess the feasibility, a qualitative approach is more suitable.

The necessity for a change and the definition of the desired outcome after the change, or "destination", do not pave the road toward the destination. To achieve the desired result, the necessary change must make sense now in our current complex world. To make sense of this change now; qualitative research is the way to go (Creswell, 2009).

Feasibility can be assessed with a multi-actor analysis, identifying what the involved actors really want from the music streaming market. Analysing how and if all involved actors are still willing to do their part if the market were more decentralised. I propose to use Comparative Cognitive Mapping (CCM) for this purpose.

3.3. Sub questions

To answer the main research question, the following subquestions need to be answered first:

1. What is a good example for an operational centralised counterpart (CCP) to Music DAO?
2. What decisions are made in the CCP to keep it operational?
3. When to consider Music DAO operational?
4. Can Music DAO make the necessary decisions to be considered operational?
5. How big is the WOPDI in the case of music streaming, an estimate?
6. What stakeholders are involved with Music DAO and its CCP, and what are their incentives regarding the music streaming market?
7. What factors are the drivers behind the market position of Music DAO versus its CCP?
8. What measures can decision makers take to help Music DAO's market position?
9. What are the similarities and differences between Music DAO and its CCP in terms of governance and power balance?

Sub-question 1 through 5 are part of the CBA, then questions 6, 7 and 8 can be answered using CCM. Sub-Question 9 considers what we can learn regarding the knowledge gap more directly. Answering these questions will answer the main research question and address the identified knowledge gap directly.

3.4. Data collection: Literature study

All necessary information will first be attempted to be gathered through literature study. This was chosen as the data collection method because conducting interviews for the whole CCM is likely to take too long, while information might also be available in the literature. Where there are gaps in the literature on the incentives of stakeholders in the CCM, interviews with relevant stakeholders should be conducted.

4

Planning

Below the planning is presented, the writing of the parts associated with the activity go hand in hand in this planning.

Activity \ week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Proposal Writing	X	X	X	X																			
Case study literature reading					X																		
Mixed methods literature reading					X	X																	
Cost benefit analysis literature reading					X	X																	
Comparative Cognitive mapping literature reading						X																	
SQ1: What is a good example for an operational centralised counter-part (CCP) to Music DAO?					X																		
SQ2: What decisions are made in the CCP to keep it operational?						X																	
SQ3: When to consider Music DAO operational?							X																
SQ4: Can Music DAO make the necessary decisions to be considered operational?								X															
SQ5: How big is the WOPDI in the case of music streaming, an estimate?									X														
SQ6: What stakeholders are involved with Music DAO and its CCP, and what are their incentives regarding the music streaming market?						X				X	X	X											
SQ7: What factors are the drivers behind the market position of Music DAO versus its CCP?													X										
SQ8: What measures can decision makers take to help Music DAO's market position?														X									
SQ9: What are the similarities and differences between Music DAO and its CCP in terms of governance and power balance?															X								
Literature study	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
Writing the thesis																X	X	X					
Feedback processing																		X	X	X	X		
Kick-off					X																		
Half way meeting										X													
Green light meeting																		X					
Defense																							X

Figure 4.1: Planning

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