"Hyperledger" versus "Hyperscaler": Can coopetition on decentralized platforms be a countervailing power to big tech?

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***Abstract*— We collect observations on how power constitutes itself in decentralized digital platform constellations that position themselves as alternatives to platforms operated by big tech (which we coin "hyperledgers"). We then compare these forms of power to the incumbent structures, the so called "hyperscalers". Such a comparison yields new insights into the way power "works" in surveillance-based platform capitalism. The crucial insight of our analysis is that it is highly unlikely that platform alternatives can be scaled up decisively within the current capitalist accumulation regime. Instead of focusing on finding business models within this regime, platform alternatives should therefore strive for regime change. This, however, would require new alliances, in particular between the victims of surveillance (workers and consumers) and the platform alternatives. The latter, in turn, would not only require massive public funding, but also support from civil society actors representing workers (i.e. unions) to be able to compete with incumbent hyperscalers.**

***Keywords*—Power relations, platform and surveillance capitalism, entrepreneurial actvisism, organizing studies, labor relations, democratization.**

I. Introduction

[1]The concentration of power typical of platform-based surveillance capitalism is not only a concern for citizens, consumers and politicians. It is also a distressing fact for companies and organizations for which digital technologies are more of a means than an end. For these reasons, some of these organizations are joining forces and form consortia to develop alternative and independent platform solutions. In these ventures, they often rely on communities of experts who have formed in the area of certain digital technologies.

The resulting networks of organizations and experts consciously position themselves as collaborative alternatives to existing centralized platforms. We look at a specific form of such collaborations in order to answer three questions: What is the potential of these alternatives to become serious threats to incumbent platforms and a countervailing power to their owners?

What mechanisms characterize power relations in platform capitalism? What role does labor and work play in constituting and countering power relations?

The research field we use to answer these questions is the so-called Hyperledger Foundation (HF). It is an example of an astonishingly stable, consortium-based constellation of actors that sees itself as an alternative to the current form of platform capitalism. We also examine the case of TradeLens. a concrete, consortium-based project in the HF environment. This project serves as an example of an alternative with a more business-oriented character that was initially very successful, but ultimately failed.

Using these cases, we collect observations on how power constitutes itself in alternative platform constellations (which we coin "hyperledgers"). We then compare these forms of power to incumbent structures (which we coin "hyperscalers"). Such a comparison yields new insights into the way power "works" in surveillance-based platform capitalism. The crucial insight of our analysis is that it is highly unlikely that platform alternatives can be scaled up decisively within the current capitalist accumulation regime. Instead of focusing on finding business models within this regime, platform alternatives should therefore lobby for regime change. This, however, would require new alliances, in particular between the victims of surveillance (workers and consumers) and the platform alternatives. The latter, in turn, would require massive public funding and support from civil society actors representing workers (i.e. unions) to be able to compete with incumbent hyperscalers.

The article is structured as follows. In Section II, I introduce two stylized antagonistic forms of organizing the platform economy: "Hyperscalers" (i.e. centralized platform operators with the ability to scale up different services related to cloud computing in a seamless way) and "hyperledgers" (decentralized consortia that compete against large platforms). Even though hyperledgers and hyperscalers are involved in a struggle resembling "David versus Goliath", I show that decentralized structures have proven to display a surprisingly high level of vitality. However, the concrete solutions produced by the consortia (such as the application TradeLens for logistics) usually fail. In Section III, I ask what could explain the surprising end of initiatives such as TradeLens and the high survival rate of structures such as HF. Section IV is a more speculative meditation on "power plays" and the role of labor in the platform economy. In Section V, we reflect on the role of labor and its political representation more empirically, Section VI summarizes the main results.

II. Hyperscalers and hyperledgers: Centralized versus decentralized corporate platforms

How are power and power relations constituted within the new platform economy? Recent events in the U.S. political system make it very clear that this question is of crucial importance. The election of Donald Trump through the help of the owner of X, Elon Musk, and the ensuing

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institutionalization of the latter as a powerful redesigner of government and governance have highlighted that power relations in platform capitalism are shifting markedly. Economic power in the digital economy not only constitutes informal political power and control over how and about what the public is informed (as it always did). It has become semi-formal or formal political power. The Kowtow of other powerful IT moguls after the election made it clear that expectations that more "liberal" powers of platform capitalism would balance authoritarian tendencies were premature.

Though rarely recognizing the dimension of the problem, political economists have foreshadowed this wider debate [1]. They have expanded the seemingly neutral representation of platforms that dominated the early years of platform capitalism to include a critical perspective. The background to this was the monopolization and power-building tendencies that started to emerge in the 1990ies: A few dominant companies distinguished themselves by controlling and extracting enormous amounts of data [2] and increasingly exploited power asymmetries to their advantage [3].

The term platform has thus increasingly become synonymous for the problems associated with the accumulation regime of platform-based "surveillance capitalism" [4]. The latter might be described as forms of "state platform capitalism" [5] which combines three elements. (1.) The concentration of economic and political power in the hands of a few technology firms and their owners; (2.) The integration of these firms with state institutions; (3.) The increasing use of platform structures in the geopolitical context.

Some of these tech firms have recently evolved into so called hyperscalers. In standard terminology, these include Amazon Web Services (AWS) (operated by Amazon), Microsoft Azure (operated by Microsoft), Google Cloud (operated by Google), Alibaba Cloud (operated by Alibaba Group, Oracle Cloud (operated by Oracle). In the narrow and more technical sense, hyperscalers are companies that provide cloud computing services through data centers. They feature vast computing resources, storage capabilities, and networking infrastructure that allow them to scale their operations rapidly to meet growing demand. They are capable of managing and delivering massive amounts of data and computing resources, on a global scale. Their infrastructure supports everything from websites to enterprise systems.

To understand the relevance of these hyperscalers for this paper, it is instructive to look at some cases that seem to be surprising at first glance. On the one hand, some of the big platform operators appear to be missing from the list of hyperscalers, in particular Apple and Meta, but also entities such as Tesla and X. On the other hand, Oracle seems to be a hyperscaler without the socio-economic omnipresence characterizing the other four entities. The explanation for this observation is relatively straightforward: Hyperscaling in the standard use of the word is an activity usually associated with digitized business-to-business activities. The business models of the big tech companies that did not become hyperscalers so far, however, are organized around the idea to provide a mix of hard- and software products to consumers. Their relationships to businesses are an important element of the respective business models, but are not their strategic focus. This is very different for the four named hyperscalers, which define themselves through their ability to deliver services and infrastructures to other companies. This, in turn, makes them alike to Oracle, which has become a hyperscaler by massively investing in respective infrastructures and strategic acquisitions. Oracles main strength has been that it has been known to be a trustworthy partner of corporations, allowing them to innovate and grow quickly without too much interference. Using its high credibility, especially vis-á-vis other large enterprises, it has leveraged its ability to employ new types of cloud technology to gain market share quickly.

The ability to "hyperscale" in the technical sense is present both in the platform operators strategically orientated towards consumers as well as individuals and in those being defined by business relationships. In the first case, however, scalability crucially refers to the number of entities that want to use a service. In the second case, it is computing and storage for a more limited number of entities. For the purpose of this paper, therefore, we would like to distinguish between hyperscalers in the narrow sense of the word and hyperscalers in the figurative sense.

- Hyperscalers in the narrow sense of the word primarily target businesses, organizations, and developers, offering them the infrastructure to run websites, applications, store data, and support enterprise workloads.
- Hyperscalers in the figurative sense primarily deal with non-corporate entities, in particular individual consumers who use social media, messaging services (like in the case of Meta and X) as well as consumer hardware and services (in the case of Apple and Tesla)

Both types of hyperscalers share many common characteristics, though: They operate global networks of data centers and employ massive economies of scale. The keywords that define hyperscalers in the narrow sense (for example in a query to ChatGTP) are very similar to those describing hyperscalers in the figurative sense. They include "automation and orchestration", "virtualization and containerization", "highly efficient hardware design", "software-defined infrastructure", "elasticity and auto-scaling", "advanced data analytics and machine learning", "security and compliance infrastructure", "edge computing", and, last but not least, "collaborative ecosystems" (ChatGTP answer to the question "What allows hyperscalers to scale cloud services so massively", posed on February 21, 2025)?

Based on these elements, hyperscalers in the narrow as well as hyperscalers in the figurative sense use platforms and other infrastructures to establish new power relationships, and integrate these power relationships with other, more traditional forms of political power. More and more, these types of power are recognized to be a serious threat to democratic politics [1].

Assuming that such ways of concentrating, integrating and using platform-based power indeed represent a serious threat to democratic politics, three obvious questions emerge: How can this concentration of power be overcome? What are the alternatives to current forms of platform capitalism? And how could such alternatives be brought to fruition? Obviously, the answer to the last question requires an answer to the first one, and vice versa. To escape from

this catch-22, it is instructive to start with the second question, and describe existing attempts to create new platforms that do not suffer from the defects of old ones. Three alternatives have received particular attention in recent years:

- Cooperative alternatives, i.e. decentralized platforms based on the idea of cooperationist structures (on platform corporativism see, for example, [6]).
- Public alternatives based on the idea that platforms provide an infrastructure that has traditionally been controlled by state-owned entities (see, for example, [2]).
- Hybrid alternatives that attempt to support smaller private actors to work on and build platform solutions, the most prominent being the European Union's (EU) Gaia project [7].

So far, all of these alternatives appear to have failed to seriously challenge hyperscalers, both in the narrow and in the figurative sense. Cooperative arrangements have remained niche phenomena of a very limited scale, the idea to seriously consider nationalizing existing private or setting up new public platforms has never taken off seriously, and Gaia X is increasingly seen as a structure that will either be dominated by existing hyperscalers or fade away. In this article, we therefore focus on another type of alternative: Decentralized corporate platforms, i.e. consortia of companies that come together to build own platform infrastructures and collaborate on them. Very often, these consortia also involve public and civil society organizations, so a more correct description would be "hybrid platforms based on consortia of corporate actors".

We believe that studying these platforms is instructive for several reasons. Most importantly, they represent direct antipodes to hyperscalers in the narrow sense, as they try to offer a decentralized infrastructure to corporations. In addition, some of these platforms consciously position themselves as antagonists to hyperscalers in the narrow and figurative sense, as they insist on the ability to redesign the internet in a more democratic, decentralized way. Finally, they share features of all of the three alternatives discussed: Like cooperative platforms, they require some form of commoning. Like public platforms, they are based on the idea to provide open access for all actors willing to accept a certain set of rules. And like hybrid platforms, they combine they feature the idea to offer of a public infrastructure to allow small- and medium-sized enterprises to freely enjoy the benefits of cloud- and platform-based interaction. We hope that studying these alternatives offers ways to not only understand their potential as countervailing powers, but shed light on the failure of public and cooperative alternatives.

In our view, a productive way to conceptualize these alternatives is to describe them as coopetitive arrangements: One of their crucial characteristics is to bring together entities that usually compete, in one way or another, and to set up governance arrangements that allow them to cooperate in spite of conflicting interests. The resulting "coopetition" involve individuals, non-profits, and public agencies. Corporations, however, usually play the central role.

In recent years, there have been several attempts to transfer concepts of the centralized platform economy to decentralized networks of companies. In such cases, one can speak of industry or corporate platforms. Corporate platforms in the narrower sense can be described as digital technologies serving as an infrastructure on which companies cooperate, build complementary innovation and benefit from network effects [8]. They are similar to IT architectures for controlling production and delivery processes, but differ in that they are "open" to external companies. How exactly "open" is interpreted varies from case to case and affects, for example, access to information, the ability to help shape the platform's rules or the ability to contribute your own program code.

These corporate platforms are not only technology-based, they also represent a meta-organizational form that is not limited to technology and is often described as an "ecosystem" [9]. The platform's main task is to establish a minimum level of coordination between the companies involved and to enable synergy effects [10]. Since it is not itself a conventional company with (relatively) fixed boundaries, the meta-organization can be defined in varying degrees of narrowness or breadth. In the narrower sense, they can be considered as governance arrangements, while in the broader sense, they represent "innovation ecosystems".

How corresponding meta-organizational forms or ecosystems are constituted depends on whether and how large companies are involved in the consortia. In this respect, the hyperscalers described above in some way represent a corner case: They also emphasize the openness of their architectures and the goal of promoting cooperation and cooperative competition between companies; their platforms, however, are highly centralized in terms of governance and coordination. Besides the corporate platforms rooted in the "ecosystems" of hyperscalers, there are corporate platforms operated by very large IT and technology corporations such as SAP, IBM. These already offer a certain degree of decentralization Finally, there are the platforms set up by technology corporations, such as Siemens Xcelerator, which offer companies ways to develop their own solutions.

I study enterprise platforms that meet the definition from [8], but that explicitly exclude the possibility of centralized forms of control. I examine two related consortia:

- *The Hyperledger consortium* (known as the Hyperledger Foundation since 2021, and now a part of now part of "LF Decentralized Trust", a sub-unit of the Linux Foundation), as an example of a "meta platform" that, according to its own statements, has the "mission" of "supporting software developers who develop open source software for enterprises in the form of platforms, libraries, tools and solutions for multi-party systems" using "blockchain, distributed ledger and related technologies". To do this, it hosts a "technical infrastructure" and a "community infrastructure" for "meetings, events and collaborative discussions". It also promotes "broad adoption of the technology by building a comprehensive and diverse ecosystem of solution providers" [11].
- *The TradeLens consortium*, which claimed to establish itself as an "open and neutral supply chain platform based on blockchain technology." Its goal was to enable "information sharing and collaboration across supply

chains." The platform was "developed jointly by IBM and GTD Solution, a division of Maersk [12].

The HF was launched in 2015 by the Linux Foundation and is located at the interface between the open source movement and blockchain. At this time, the topics of blockchains and cryptocurrencies were gaining public interest. Hyperledger was to be explicitly positioned as a project that uses blockchain and distributed ledger technologies to optimize business applications. With this focus, the consortium stood out from the rest of the blockchain scene, which initially kept a large distance to established institutions and companies. The aim of the HF was to provide reliable blockchain applications and tools and to create a forum where members could coordinate their cooperation.

The HF's membership has been diverse and covers a wide range of organizational forms. At the time when we accessed the field, the website listed 183 members. These were predominantly companies from the blockchain sector, IT service providers, financial companies and universities. But there were also logistics companies, health care providers, government institutions, as well as companies from the automotive, insurance and mining sectors. Various versions of Hyperledger have been developed within the consortium and optimized for specific use cases. The majority of organizations involved are headquartered in North America, followed by Asia and Europe. The HF itself has various membership levels and governance arrangements, such as a charter, a technical steering committee and a governing board.

Participatory observations at Foundation events and interviews with members give a mixed picture of the organization's ability to provide a credible alternative to established platforms in the long term. On the one hand, it regularly succeeded in developing effective structures and discourses. On the other hand, it has not yet succeeded in establishing viable business models and applications. Numerous projects have been taken to a point where there was considerable interest from established companies such as Bosch or Siemens and also corporate associations such as the National Association of Realtors. However, these have not gained the importance expected at the outset.

Given the lack of implementation success, it is surprising how attractive and, above all, resilient the consortium has been. We believe that explaining this resilience is instructive, as it offers insights into the stability of alternatives to existing, centralized platforms. In addition, the HF's experience is reflected in similar developments in related consortia based or partly based on blockchain. Examples include the Enterprise Ethereum Alliance, R3 Corda, MOBI, and Quorum. Not all of these consortia achieved similar successes as the HF. However, they have at least succeeded in bringing the idea of a decentralized deconstruction and reconstruction of the Internet based on the idea of distributed ledgers to life over longer periods of time with concrete work on software and business models. The resilience of these structures has become particularly evident when scandals surrounding cryptocurrencies led to a very high level of skepticism towards corresponding structures.

TradeLens, the second consortium we are studying, has long been one of the flagship applications to emerge from the HF. It has been both a consortium of various companies from the logistics sector and a digital, open source, blockchain/DLT-based supply chain platform. The platform was originally developed by IBM, GTD Solution and Maersk. The goal of TradeLens was to enable a "common neutral platform" for exchanging information and managing processes along the supply chain and across company boundaries. Very different players including traders, freight forwarders, inland transport companies, ports and terminals, maritime companies, customs and other government authorities had the aim to come together on a single, secure "data-sharing and collaboration platform".

Before its failure in autumn 2022, TradeLens proved to be an advanced application with a seemingly high implementation potential for a considerable period of time. This made the news that work on the consortium would have to be stopped all the more surprising. Similar to the stability of the HF meta-platform, the fragility of the specific TradeLens project is reflected in the experience of similar projects in other consortia. Although the consortia repeatedly report successful pilot phases, the respective projects usually bog down after some time. For example, a study by the WTO identified 39 projects in the area of supply chains, but none of the projects had matured beyond the pilot phase or concept stage [13]. A study by the European Parliament also identified TradeLens as the only enterprise blockchain project that has progressed beyond the pilot phase [14].

The simultaneous stability of consortium meta-platforms such as the HF and the fragility of the user platforms that have emerged in the context of these consortia, such as TradeLens, is a puzzle whose solutions we hope will provide deeper insights into the dynamics of platform capitalism. In the next section, we therefore address two questions: How can we explain the high stability of a consortium such as the HF, which is abstract in many respects, and the simultaneous failure of a consortium that, at first glance, is developing well with a promising use case? In section IV, we compare HF and TradeLens (the hyperledgers) with hyperscalers and ask: What do we learn from these cases about power asymmetries and the exercise of power in platform capitalism? Based on answers to these questions (which are obviously highly provisional), we then turn to labor policy implications in Section V.

III. THE LABORIOUS "PAINS OF THE PLAINS" AND THE POWER OF PLATFORMS

We examine the question of stability and fragility of platform alternatives based on consortia through the lens of "Organizing and Practice Studies". These are organizational science approaches that take up impulses from Science and Technology Studies (STS) and Actor Network Theory (ANT) in order to better describe the procedural nature of organizations - their emergence, existence and demise. They thus oppose ideas of organizations as static phenomena and emphasize that what we experience as an organization is a snapshot of a constantly ongoing and changeable organizational process [15]. The approach also opposes tendencies towards anthropomorphizing organizations [16]. In order to understand and describe organizations, in addition to the formal self-description, it is necessary to examine which effective connections are made between

actors. In line with STS and ANT, technology takes on a certain life of its own in this context. Although technology is not a fully-fledged actor, since it must fundamentally be "mobilized" by human actors, it can be described as actor-like in the sense that it is resistant and at times produces unforeseen or unintended consequences [17].

This approach has numerous implications for the critical examination of questions of power, power asymmetries and potentials for the exercise of counter-power in the context of the platform economy. This can be illustrated by referring to Latour, who with the sentence “The notion of power should be abandoned” [18] first calls for a critical examination of conventional concepts of power. Conventional concepts of power can summarize the consequences of an action, but reach limits when it comes to explaining the processes behind it. In line with the “organizing” and “process studies”, power must be thought of as a process.

We therefore do not initially ask who “has” power or not, but rather which connections and constellations between human actors and between them and non-human actors enable or prevent power from temporarily taking effect in actu. This has direct implications for the analysis of platform alternatives. The platform cannot only exist as a digital infrastructure. Technology is part of the platform, but it only exists in actu where it creates and stabilizes effective connections. The chosen perspective is therefore "material-semiotic" [19], because it examines associations between people, things and concepts. These effective connections are based on an alternative technological infrastructure, but also on a transformation of priorities, a specific organizational self-image and the behaviors that correspond to this self-image [20]. Power is then a consequence and not a cause of collective action and the ability of big tech platforms and platform alternatives to act [21].

This results in the need for a change of perspective that addresses the question of which associations of heterogeneous actors and actors must come about so that we can speak retrospectively of power, because “some orders are obediently followed, others are not” [21]. For this to be the case, the actors and actors in question must accept their new role assignments and the definition of their functions [22]. At the same time, following orders cannot be thought of as simply deterministic, but is in many ways a translation process in which orders can be modified, varied or manipulated [21].

The case of TradeLens offers insights into the question of which associations constitute power. At the time of its failure, TradeLens was able to give the impression that it exercised considerable industry power. The association of IBM and Maersk meant that it had the backing of two large companies that could provide a heterogeneous ensemble of resources. TradeLens repeatedly made public success stories about new members joining the platform project. Initially, there was friction due to the strong presence of Maersk. As the world's largest shipping company, it aroused skepticism towards the platform among competitors [23]; however, by adapting the governance model originally proposed by IBM and Maersk, even major competitors such as Hapag-Lloyd, CMA, CGM and MSC were convinced to use the platform in the following years [24]. The resolution of these conflicts led to the adoption of new roles and functions by companies that are also competitors. Coopetition seemed to work. The associations that define TradeLens as an emerging organization are thus initially expanding considerably.

This expansion is not limited to rather similar actors, but includes a heterogeneous ensemble of actors such as large ports [25], which themselves represent a complex network of actors made up of people, machines, vehicles, warehouses, shift schedules, etc. According to the TradeLens website, there were also members in Germany, such as EKB Container Logistik in Bremerhaven, IGS Logistics Group Holding GmbH in Hamburg or TFG Transfracht GmbH in Mainz. From this successful association, TradeLens emerged as a seemingly fully-fledged platform alternative, whose members accept their role assignments and translate the demands and requirements of the TradeLens platform into the context of their companies.

Nevertheless, TradeLens had to cease its activities in autumn 2022. Rotem Hershko, Head of Business Platforms at Maersk, explained it this way:

> *“Unfortunately, while we successfully developed a viable platform, the need for full global industry collaboration has not been achieved. As a result, TradeLens has not reached the level of commercial viability necessary to continue work and meet the financial expectations as an independent business” [26]*

Although TradeLens supposedly mapped “almost half of global container traffic” in 2019 [27], it was never able to establish itself as a global standard, as a true industry platform. The reactions and classification of this development varied. In particular, however, it has been emphasized that neither Maersk nor IBM had been willing to bear the considerable costs of establishing a global supply chain platform [28]. Even though an agreement had apparently been reached in the meantime, conflicts over power and ownership of the platform remained virulent and were subsequently used as an explanation in various reports.

As a platform alternative, TradeLens demonstrates what I would describe as the paradox of "successful failure". It has been a platform that had to give up just at the moment when it successfully gained ground. But what conclusions can be drawn from this failure for questions of power in the platform economy? I hypothesize that TradeLens’ failure is an expression of a lack of ability to expand and intensify networks of relationships, which are in clear contrast to the capabilities of established platform and corporate structures. The media coverage of the failure of TradeLens shows:

– Many conflicts over ownership of and decision-making power over the shared platform remained virulent. As suggested by Organizing Studies, pacifying associations was an ongoing task that had to be solved again and again. In particular, it is clear that the attempt to create a shared platform for coopetition was problematic because it required competitors to cooperate on an equal footing, and they were obviously not prepared to do so.
– According to statements, the association with the common platform also failed because the technology itself resisted the association in various contexts. On the one hand, the platform itself is presented as overly complex; on the other hand, it failed because associations with legacy systems or completely

analogue administrative apparatuses did not work. Translation processes come to a standstill, power in actu is not constituted.
- Costs were a persistent problem. Only by stabilizing the association with highly speculative investments has the existing platform economy been able to pursue growth regardless, of many other metrics. Maersk or IBM, however, were not prepared to risk their resources in a venture mainly benefiting the broader industry.

The end of TradeLens resembles the experience of the Aramis project, which for ANT is probably the most formative example of the failure of an ambitious technology project [29]. Like Aramis, TradeLens failed neither because a specific actor brought it down nor because it failed to generate enthusiasm and develop implementation potential. The project failed because of the unwillingness to sustain it through translation, painstaking negotiations and constant adaptation to changing environmental conditions.

In contrast to TradeLens, the HF draws on its ability to establish and continually modify actor networks, as participant observations at foundation events and interviews with selected members show:

- One of the Foundation's current focuses, for example, is on projects that promise a coherent solution to questions of identity management in digital spaces. The goal is to organize the digital identity of individuals in a decentralized manner and to take away a central pillar of power from the large platform corporations. The narratives built up in corresponding projects create plausible ideas for the reconstruction of the Internet as a democratic space that enables freedom.
- By involving and simultaneously containing large corporations (from German-speaking countries, Bosch, Deutsche Telekom AG, Mercedes-Benz Tech Innovation GmbH and Siemens AG are represented, among others), established network structures (such as HLB, a network of small and medium-sized auditing firms) and actors from the public sector, a high degree of credibility, practical relevance and continuous engagement with different spheres of influence is ensured.
- The HF is perceived as a place that enables meaningful and forward-looking work. This is supported by the ability, clearly evident in participant observations, to take the lead in those who actively address the problems of the IT industry with regard to gender and diversity issues and dare to take innovative approaches.

The HF is therefore stabilizing itself as an actor in which central processes of translation converge, similar to [30]. Indeed, in many ways it is involved in precisely those “moments of translation” that [31] describes as problematization, interessement, mobilization and enrolment.

Our preliminary investigations based on document analysis, a relatively small number of interviews and observed participation in the HF, TradeLens and similar Hyperledger-based projects can be condensed into three preliminary hypotheses that should be critically examined in further investigations. First, the fragility and stability of platform alternatives that are, on the one hand, based on relatively decentralized corporate consortia, and, on the other hand, rely on a strong technology orientation, is severely limited by their ability to carry out laborious processes of scaling, extensification and intensification of actor networks, a work that we describe, following Berthold Brecht, as "the painstaking labors of the plains". Second, precisely those processes that replace classic exercise of power in ANT play a decisive role. However, these are not enough, since platform capitalism is also and not least determined by forms of domination that go beyond the relationships emphasized in ANT or set a different focus to explain power asymmetries.

The first hypothesis states that the viability of alternatives is related to the ability to solve problems of extensive associations between and within the companies involved (or those that are to be involved for a permanent presence). With these “pains of the plains”, we refer to dealing with the heterogeneity that each participating company itself represents as a network of actors and that is concealed by the representation of "the company" as a member of the platform:

- TradeLens fails because of these pains of the plains. Although TradeLens was able to resolve certain problems at the organizational level, a large number of other associations would be needed for a company to be fully active "on" the platform. A key reason for this is the intense competitive relationship between the companies involved, which the coopetition narrative can only conceal with difficulty. We also suspect that associations between the organizations involved often remain on the surface and only affect a small group of actors.
- The HF, on the other hand, copes with the difficulties of the plains much better. This is also due to the fact that as an organization it is precisely geared towards translation processes and therefore masters them confidently. But it is also due to the fact that the competitive relationship between the companies involved in the HF is much less pronounced, making coopetition a meaningful narrative.

The second hypothesis relates the “laborious pains of the plains” to questions of cooperation between companies in the context of platform alternatives that attempt to rely less on enforcement through power asymmetries. In particular, the failure of the alternatives is due not least to the fact that they are unable to bring about changes that are associated with the power of existing platform companies in other areas of digital transformation. The consortia we have examined are characterized by their lack of ability to reshape the organizational and work levels and to adapt them to technical requirements with standardizations so that they fit the technical solutions developed. Consortia like TradeLens also fail, not least because of the lack of opportunities available to large corporations to exercise power. The different options for digitally transforming the organizational and work levels are an expression of a specific power asymmetry. Where these associations cannot be forced, they require considerable effort, which is reflected, for example, in the problems described by interviewees in integrating non-human actors (machines, documents, administrative processes, etc.). At the altitude of the HF, problems of the exercise of power are much less apparent. Where they do occur, the specific networking structures of the HF, which symmetrically integrate actors

with very different resources and objectives, prove to be surprisingly effective.

The third hypothesis addresses the possibilities and limitations of consortia such as the Hyperledger Foundation, but also the EEA, R3 Corda, MOBI or Quorum, to fuel the imagination of platform alternatives and thereby continue to exist as (meta-)organizations themselves. Those AN constellations that, like HF, are dedicated to the task of creating new power relations not only derive a relatively high level of permanence from this. They legitimize and stabilize themselves through visions of creating new power relations in platform capitalism. The concept of coopetition plays an important role here, as it suggests that a competitive society is possible in which the infrastructures fundamental to this competition can be created and maintained through fair coordination processes. Only in the "live phase" can projects really fail. The associations of the pilot phase can be stabilized without going through the "painstaking labors of the plains." As long as the platform alternative does not try to create the actual associations with the heterogeneous ensemble of the various companies, it does not fail.

IV. Hyperledger versus Hyperscaler: Unscrewing the Big Leviathan Though Coopetition?

In the preceding sections, I have provided preliminary answers to our first research question: “In how far can corporate coopetitive arrangements based on blockchain communities be the basis for a countervailing power to centralized platforms?” The analysis shows that the potential for these arrangements is highly limited, due to several factors. The more stable and resilient structures such as the HF do not specialize in providing real-world applications, but in creating an environment to “keep hope alive” and to work on more radical but so far unsuccessful alternatives. Actual platforms based on horizontal coopetition, such as TradeLens, might look promising alternatives for quite some time, but then fail to live up to their promises in the end. The analysis also shows that “lack of power” in the sense of ANT is a major factor in explaining both the success of HF and the failure of TradeLens.

What does this result tell us about power in the platform economy more broadly, in particular about the power of the hyperscalers, both in the narrow and the figurative sense? In this section, I allow myself to introduce some first and more experimental speculations about this question, takin into account the role of labor more explicitly. The main aim is to remind readers that power in the platform economy can only be understood if its various dimensions (economic, social, cultural, and political) are all considered and fed into an integrated description of the current accumulation regime, with special attention to the role of labor.

Against the backdrop of the preceding analysis, it is tempting to attribute this power to three factors: The ability to easily overcome the “pains of the plains” (by using the vast amount of financial and personal resources available to them to compel diverse stakeholders into those standards and governance arrangements consistent with the technological and economic needs of a certain solution), their scale (which allows them to either drive competitors out of the market, or buy them out as soon as they become a serious threat, and their complexity (which makes it extremely difficult to regulate them).

The strategies to do so are very diverse and often related to business models: The three hyperscalers in the narrow sense connected to big platform operators largely rely on their omnipresence in the corporate sphere, which is based on their ability to network extensively through the social and political fabric of surveillance capitalism. Most hyperscalers in the figurative sense employ similar techniques as, but base them on their omnipresence with consumers. Oracle, the fourth hyperscaler in the narrow sense, seems to have built a certain omnipresence through distinguishing itself both technologically and in terms of its relationship management: It positions itself as the hyperscaler that can be trusted because it is more focused and potentially less prone to abuse its infrastructural power. Finally, large platform companies that do not fit into our dichotomy network extensively to preserve their power in concert with the hyperscalers. An interesting example would be SAP, which has built close alliances with hyperscalers to ensure its smooth integration into respective cloud infrastructures.

What role does labor play in this power play? To answer this question is beyond the scope of this paper, though the next section gives some insides from our empirical work in the field. To give a more valid analysis one would need to look at the power of platforms vis-á-vis workers and their environment as well as the power of workers vis-á-vis platforms and their environment. [32] provide an analysis very much in the spirit of our paper, based on a social fabric of platform capitalism. They argue: “Platform companies subject social connections to the dictates of capitalist production, effectively transforming activities like market exchanges, networking, and various forms of interaction into integral components of the capital's value-generation mechanism.” This networking importantly takes into the "outernet," which “encompasses the intricate web of social, cultural, and economic relationships extending beyond and transcending the Internet, envelops and establishes connections between the Internet and broader currents of labor, culture, and authority.” [32].

We believe that such a view is highly relevant, but needs to be complemented with a more Gramscian type of analysis. More specifically, many studies looking at power “in actu” fall into the trap of neglecting the role of power “in potentia”, or, more exactly, more distant and indirect structures of influence. To not ignore the relevance of the procedural aspects of power and the role of actor networks sometimes leads to ignore the role of these more abstract channels of influence, as well as the role of more not-so abstract methods such as co-opting necomers before they become threats, lobbying politicians to avid regulation that opens new spaces for alternatives, such as in the case of Gaia-X, which has become a prime example of big tech’s successful attempts to use its influence to inhibit the emergence of independent platform solutions.

In this respect, it is instructive to go back to one of the foundational texts of ANT’s approach towards power, Callon and Latour’s 1981 article [30], and cite it in some lengths. Close to the end of the text, the authors warn of two mistakes sociologist might make when dealing with the relation of micro- and macro-actors. The first one has been highly influential, has informed the analysis above, and has now become the standard way of conceiving power [30]:

"A macro-actor, as we have seen, is a micro-actor seated on black boxes, a force capable of associating so many other forces that it acts like a 'single man'. 'The result is that a macro-actor is by definition no more difficult to examine than a micro-actor. Growth is only possible if one can associate long lasting forces with oneself and thereby simplify existence. Hence, a macro-actor is at least as simple as a micro-actor since otherwise it could not have become bigger. … We must leave behind the preconceptions which lead us to believe that macro-actors are more complicated than micro-actors. … A macro-actor can only grow if it simplifies itself. As it simplifies its existence, it simplifies the work of the sociologist. By claiming that macro-actors are more complex than micro-actors, sociologists discourage analysis, and hamstring investigators. And they prevent the secret of the macro-actor's growth from being revealed: making operations childishly simple. The king is not only naked, he is a child playing with (leaky) black boxes."

Looking at the world in this way, however, involves the risk of forgetting about the role of the omnipresence of macro-actors [30]:

The other preconception, too often shared by sociologists, is that individual micro-negotiations are truer and more real than the abstract, distant structures of the macro-actors. Here again, nothing could be further from the truth, for almost every resource is utilized in the huge task of structuring macro-actors. Only a residue is left for the individuals. What the sociologist too hastily studies is the diminished, anemic being, trying hard to occupy the shrinking skin left to it. In a world already structured by macro-actors, nothing could be poorer and more abstract than individual social interaction. The dreamers who would like to restructure macro-actors on the basis of the individual will arrive at an even more monstrous body for they must leave out all the hard parts which have enabled the macro-actors to simplify their lives and to take over all the space.

According to Callon and Latour, not falling in neither of the two traps requires to study the emergency of macro-actors in terms of a science of monsters, a teratology. As correctly pointed out by [33], such an approach requires to combine an analysis of the "painstaking labors of the plains" with the recognition that incumbent macro-actors possess a multitude of possibilities to undermine attempts to create serious alternatives:

Why did innovations in electric vehicles half a century ago require a teratology? Because Electricity of France, the state-owned utility company, had to imagine and shape heterogeneous relations for an entire world—including everything from technical models to new green subjects, changing economic systems to battery components—where the not-yet-existing electric vehicles would fit like hand in glove. Meanwhile, the car-maker Renault clearly understood that this brave new world would pose an existential threat to the already existing one, home to its gas-guzzling machines. Hence, it spared no effort to identify and undermine the weakest links in the world under construction.

Taking such descriptions seriously implies that the power of hyperscalers and the powerlessness of hyperledgers are indeed two sides of the same, monstrous coin. Put differently, it is not only a sociological (let alone a pure economic) power. It is a truly political power that can only be overcome politically, through another "painstaking labor of the plains", a type of Gramscian "war of position" that undermines the hegemony of platform capitalists.

V. Implications for Labor Policy

The analysis so far shows that the platform alternatives we have considered also fail due to the lack of opportunities available to large corporations to exercise power. The different options for digital transformation of the organizational and work level are an expression of a specific power asymmetry. Against this background, the decentralized alternatives facing the large platform corporations are faced with the question of where networking deficits are particularly large and how to respond to them. Based on the participant observations that have been carried out so far, which still needs to be confirmed by further research, the lack of engagement with employees and their representatives that is evident in the consortia we are researching appears striking. These are only used sporadically in conception phases, and there is no systematic involvement. In the few interviews we have conducted so far on this topic, which we want to confirm with further empirical research in the future, the question of what implications the work of the consortia has for employees is often followed by astonishment and a more general reference to the possibilities of better monitoring employees:

"Oh, boy. Maybe there might be some implications. So because nowadays it's quite hard to monitor the progress of the knowledge workers that work remotely. So there might be some attempts to make the more easy verification of the work done by remote workers."

There are always efforts to involve employees. However, the focus is on employees' opportunity to gain positive experiences themselves by participating in the consortium…

"So, I think employees can actually grow. Obviously, they were not sharing any company secrets, but they were sharing, the discussions were around this open source project. So, everyone is equal, right? …

… and less information about the reality of those who would be affected by new platforms:

"But something that stuck with me … [was] … the point that you said 'we need to actually know from the ground level', right? When we talk about any solutions or problems that we build on top of blockchain, we are having a bird's eye view. We are actually not going and seeing what's actually happening on the ground."

Our impression so far from meetings with employee representatives is that the technicians' lack of interest in

such interactions corresponds to a similar lack of interest among employee representatives.

While the lack of interest on the part of employees is understandable due to the often dubious likelihood of implementation of corresponding projects (especially since there is no shortage of real problems that works councils, for example, have to deal with in the course of digital transformation), the lack of interest on the part of consortia is surprising for three reasons. Firstly, more active involvement of employees would offer the potential to increase the likelihood of operational implementation. This is certainly recognized by the actors of the alternatives, but rarely actively used. Secondly, the lack of interaction with employees contrasts with the now often intensive involvement of regulatory and political actors, which we experience as intensive in interviews and participant observations. Thirdly, the distance between consortia and employees contrasts with the working environments in which the actors specifically involved in Hyperledger projects operate, and which now show a very high degree of participation and involvement between the people involved in the technology itself.

What interest could there be on the part of employees and their representatives in actively engaging in debate and participating in translation processes - despite the highly uncertain business relevance of some projects? In addition to possible learning experiences and insights into the world of platform alternatives, we see three main reasons, all of which are related to the specific organization and governance of corresponding alternatives, which are based on the use of terms such as "coopetition" or "ecosystem".

Firstly, it is by no means certain that the projects in question will have no consequences for employees at all. Given the involvement of powerful companies with strict return targets, it is by no means certain that none of the projects currently being pursued in the Hyperledger Foundation could become a successful alternative platform. In addition, in our research we observe cases in which large corporations further develop and bring to market ideas that were developed and decisively advanced in the context of coopetition-based platforms. But in other areas too, more centrally controlled business models that are relevant for employees could emerge around platform alternatives. Finally, we often observe narratives and discourses in the context of corresponding initiatives that have a lasting effect on companies and their employees [34].

Secondly, trade unions and co-determination bodies are rightly concerned that so-called ‘innovation ecosystems’ (for a critique of the term, see [9]) could lead to developments that are actually relevant to co-determination being prepared and in some cases already implemented in an environment outside the company and thus bypassing the Works Constitution Act. This concern addresses a problem that employee representation has already been confronted with in more traditional network structures and network-based forms of production, which are also often based on coopetition: the move towards more open organizational forms could, if not accompanied by new networking structures, encourage an erosion of participation processes.

Third and finally, trade unions and co-determination bodies must also pay tribute to the fact that power in platform capitalism is constituted in a specific form that favors a kind of double power asymmetry. On the one hand, power is increasingly created in highly technological contexts. It can therefore often be described very well using theoretical approaches based on relatively symmetrical actors. It may therefore become increasingly important to participate in processes of translation whose direct relevance for the employees of a specific company is limited at first glance. At second glance, participation in corresponding translation processes may make a decisive contribution to ensuring that the labor factor can be represented “powerfully.” On the other hand, power in platform capitalism is also characterized by the dominance of more classic forms, since large corporations (often and not least networked with public actors, see [1]) play a crucial role. These can only be described to a limited extent using the categories of ANT. One of the few ways to generate counter-power here could be through new forms of networking.

VI. SUMMARY AND OUTLOOK

In platform capitalism, it is not just companies of a similar nature that are in a competitive and observational relationship, but also different ideas about how to organize infrastructure. On the one hand, there are private platforms on which a more classic competition takes place under centrally set conditions. On the other hand, there are very different structures that have very different ideas about desirable forms of governance. In addition to hybrid infrastructures such as GAIA-X or more activist projects based on the idea of "commoning", there is also increasing work on private sector alternatives. Both sides advertise that they cleverly combine competition and cooperation by enabling forms of "coopetition".

Using two examples, we show that private sector alternatives fail, not least because of the lack of opportunities available to large corporations to exercise power. The different possibilities for digital transformation of the organizational and work level are an expression of a specific power asymmetry. We first analyze this asymmetry with reference to theories that explain power in process terms. In the decentralized platforms we researched, power is actually constituted in a rather subtle way that is very close to Latour's idea. Similar to [29], it is about tracking the negotiation and adaptation processes that are necessary to be able to cope with the difficulties of the level. The concept of coopetition plays a central role here, as it suggests that a competitive society is possible in which the infrastructures fundamental to this competition can be created and maintained through fair coordination processes.

In contrast, there are the old power relations represented by the central platforms (or their ecosystems) (which have recently been claiming to enable coopetition themselves). The employee constellations that represent new power relations usually come off worse here. This form of "powerlessness" has a variety of causes, ranging from a lack of time and monetary resources to a specific understanding of the relationships between organizational, institutional and technological entities to a cultural and ideological distance between technology enthusiasts and more traditional employees. It is crucially rooted in the specific employee constellation. The new power relations work particularly well when (as in the case of Hyperledger) there is a close-knit, not least technology-based, network in which

all actors agree above all that the consortium must be expanded and maintained. However, this network lacks the struts and connections to the level of companies and workers. In addition, consistent "coopetition" is a particularly laborious and lengthy process if there are not a few larger and better networked players present to shorten coordination processes. This is currently noticeable in the consortia under consideration in that larger players such as Siemens or Accenture are actively involved. Without these, the consortia under consideration are not in a position to initiate moments of translation and to forge alliances with more traditional players with regard to concrete "use cases". They are powerless, especially in view of the closely-knit AN constellation of the central platform operators.

Against this background, the decentralized alternatives facing the large platform corporations are confronted with the question of where networking deficits are particularly large and how they can be responded to. Based on the interviews conducted so far, which still needs to be confirmed by further research, the lack of engagement with employees and their representatives that is evident in the consortia we researched appears to be particularly glaring. We see the great distance between technology-driven alternatives to centralized platforms and the world of employees as an important starting point for correcting the power asymmetry described. Consortia such as Hyperledger and their offshoots have many reasons to talk more with employees and their representatives.

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