

Futures of algorithms and choices: Structuration of algorithmic imaginaries and digital platforms in Europe

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Abstract: The increasing impact of algorithmically driven processes on human societies, which can exacerbate political, economic, and cultural asymmetries, raises questions about reducing human agency by constraining platform structures. We draw on the theoretical concept of algorithmic imaginary, which captures users' appropriations and ideas of these processes. In this paper, we focus on the dynamics between agency and structure in algorithmic imaginaries regarding the future of digital media platforms in Europe. The paper takes structuration theory as a theoretical starting point and employs methods of futures studies to analyze how the future is constructed in scenarios developed by a diversity of experts participating in a series of workshops. The future scenarios analysis is mapped around four actors, namely platform users, platform corporations, algorithms and institutions. By considering the role of various actors, particularly institutions, and their interdependencies this paper contributes to more balanced conceptualizations of algorithmic imaginaries, which tend to be centered around users' perspectives.

Keywords: Algorithmic imaginary, platformization, construction of the future, structuration theory, platform capitalism

INTRODUCTION

Many aspects of everyday lives, from political debates on social media to cultural consumption and dating, have in recent years been platformized (Armano et al., 2022), and therefore gradually affected by processes driven by algorithms. The increasing role of algorithms, or artificial intelligence, which can exacerbate political, economic, and cultural asymmetries in societies (Eubanks, 2018), raises questions about human agency being reduced or even lost in the (near) future, by constraining structures represented by digital platforms and their algorithms.

These questions reappear repeatedly with every techno-social shift (Mosco, 2004), but currently, algorithms have been occupying the imagination of platform users. This fixation is captured by the theoretical concept of “algorithmic imaginary” (Bucher, 2018), which is an idea that brings focus to “users’ appropriations of algorithmic processes operating in opacity and their imaginaries of these operations” (Schulz, 2023, p. 647). Elsewhere, it appears in variations, such as “platform imaginaries” (Van Es & Poell, 2020). The notion of imaginary (or imagination) is well established in the tradition of media studies research, especially in media reception and audience studies (see Ang, 1985). At its core, the concept of algorithmic imaginary – which can be considered an addition to the concept of social imaginary (Castoriadis, 1997) – embraces users’ reflections of reality and their phantasms of the future, but it is also essential for “the formation of sociality” (Schulz, 2023, p. 650). Therefore, algorithmic imaginary is approached as a productive and creative ability. Moreover, the aspect of sociality is reflected through the argument that users are “othering” algorithms in everyday practices, as Gandini et al. (2023) write, building on Bucher’s concept; i.e., users reflexively engage with algorithms as if they were a separate agential entity (p. 420–21).

In this article, we are not aiming to forecast or predict the future but to capture the specific algorithmic imaginaries in and about Europe, and particularly the ways that the futures of algorithms and choices are constructed in these imaginaries. Rather than gazing into the crystal ball, the empirical part – which employs the methods of futures studies – analyzes how the algorithmic imaginary about the future of European media platforms is constructed by a diversity of experts. For this purpose, we analyzed data from four Delphi+ workshops at various locations in Europe (see Table 1). The Delphi+ participants were experts, ranging from science fiction writers and filmmakers to activists and journalists to researchers with expertise in bioethics, AI or foresight, who were asked to produce future scenarios. As part of the EUMEPLAT future scenario writing project, the Delphi+ output was combined with (future scenario) essays written by the authors of this text.

We translated the debate about human agency and algorithms into the dynamics between agency and structure in algorithmically governed platform environments. The starting point of the theoretical reflection in this article is structuration theory (ST), as it was initially developed by Giddens (1984). However, we add a brief overview of more contemporary approaches to ST, which have been favored by information systems researchers, but also by researchers from platform studies. We thus prioritize broader approaches that allow us to see algorithmic assemblages of entangled relationships between various actors.

The future scenarios analysis is developed on the axis of structure and agency around four actors, which emerged by filtering the theory through our data. These actors were platform users, platform corporations, algorithms and institutions. We argue that by explicitly adding institutions as actors, we contribute to more symmetrical configurations of algorithmic imaginaries that tend to put too much focus on users' perspectives (Schulz, 2023, p. 647). Ten scenarios (as clusters) were developed around these actors, and they further provided a perspective on interdependencies between these actors. Some of the future algorithmic imaginaries involved transhumanistic and neuro-futuristic visions of humans enhanced by algorithms, that were inspired by science fiction narratives (Harrison, 2023). Other algorithmic imaginaries were more pragmatic concerning the platformization of EU or the hope in supranational institutions securing the algorithm transparency in the future.

A BRIEF THEORETICAL OVERVIEW ON STRUCTURE AND AGENCY

Structure and agency are central concepts in sociology (Stones, 2017). On the one hand, structure has been traditionally understood as the relatively stable arrangements that exist in any social order, or as a system of entrenched institutional patterns that limit free will and choice. On the other hand, agency has been typically seen as a more active and processual element in human societies that refers to the capacity of individuals or groups, such as political movements, or simply people, to act independently. Cohen (1989) uses an aphorism by Marx to illustrate this relationship: "Human beings 'make their own history, but not in circumstances of their own choosing'" (Marx in Cohen, 1989, p. 9).

Some authors, especially the representatives of structural functionalism like Durkheim, tended to privilege structure over agency, while others, such as Giddens, attempted to overcome the dualism between structure and agency. Giddens refers to structure as "recursively organized sets of rules and resources" (Giddens, 1984, p. 25) that are "implicated in social reproduction; institutionalized features of social systems have structural properties in the sense that relationships are stabilized across time and space" (Giddens, 1984, xxxi). Agency is more

than a matter of individual will and skill: “For Giddens, agency is enhanced by control over *resources*; it is exercised through the following, or rejection, of *rules*.” (Whittington, 2015, p. 147, emphasis in the original).

At the core of Giddens’ structuration theory, which was outlined in ‘New Rules of Sociological Method’ (Giddens, 1997) and most systematically mapped in ‘The Constitution of Society’ (Giddens, 1984). The theory is an attempt to see concepts of structure and agency in a mutual relationship of interdependency and reciprocity. For this purpose, Giddens introduced the notion of duality of structure: “Structure must not be conceptualized as simply placing constraints upon human agency, but as enabling [...]” (Giddens, 1976; 1997, p. 169, emphasis in the original). In the latter publication, he further developed the concept: “[...] the structural properties of social systems are both medium and outcome of the practices they recursively organize” (Giddens, 1984, p. 25).

Structure is thus seen in motion. According to Whittington (2015, p. 149), it is “an important implication of structuration [...] that structures are not fixed or given”. It opens the possibility of change for society. The contemporary developments of structuration theory are “designed to refine and enrich the conceptual range and precision of structuration” (Stones, 2020, p. 410).

STRUCTURE AND AGENCY THROUGH PLATFORMS AND ALGORITHMS

These theoretical debates around structure and agency can inform the ways we look at the structuring power of algorithms in digital platforms. Platforms are digital infrastructures facilitating multi-sided markets and mediating modes of production, consumption, and user interactions (Srnicsek, 2017). Srnicsek sees platforms as “intermediaries that bring together different users: customers, advertisers, service providers, producers, suppliers, and even physical objects” (2017, p. 43). There are assorted typologies of platforms (Srnicsek, p. 49), of which Steinberg and Li (2017, p. 176) distinguish between three types: product-technology platforms (computing infrastructure like Apple), content platforms (social media platforms such as Twitter or YouTube), and transaction-type or mediation-type platforms (Amazon).

Van Dijck (2013, p. 25) considers platforms as techno-cultural constructs and socio-economic structures and disassembles them into their constitutive components. Approaching platforms as the former means to analyze “technology, users and content in close alignment” (Van Dijck, 2013, p. 28); the latter designates focusing on “their ownership status, governance, and business models” (Van Dijck, 2013, p. 28). Van Dijck et al. further highlight the inseparable relation between online platforms and societal structures: “Platforms do not reflect the

social: they *produce* the social structures we live in” (2018, p. 2, emphasis in the original).

Structuration theory has been used to “explain organizational adoption of computing and other technologies” (DeSanctis & Poole, 1994, p. 125; Orlikowski, 1992). The concern with structure made structuration theory attractive for information systems researchers “despite its almost complete neglect of technology” (Jones & Karsten, 2008, p. 134). Webster (2011) applies structuration theory to the platform environment to show how interactions between agents and structures (individuals and institutions, in his words) construct the algorithmically organized media landscape. At the core of Webster’s analysis is the concept of “user information regimes” – recommendation systems or algorithmically driven search engines – that illustrates how these regimes are constructed from user actions and choices. Such – enabling and constraining – regimes (Webster, 2011, p. 43) are socially constructed, and they enable participation, but users’ activity can “be harvested in various ways and used to produce the many forms of surveillance” (Webster, 2011, p. 50; see also Mathieu & Pruulmann-Vengerfeldt, 2020).

If platforms produce structures in the Giddensian sense, then the algorithms are the structuring mechanisms that structure user behavior, shape content, and feed (in the form of user data) recommendation systems: “Algorithms are tools for structuring and influencing *repeated* data: designed to pattern input and instrumentalize output” (Foster & Zhang, 2022, p. 1, emphasis in the original). Webster emphasizes that algorithms determine attention in certain ways, they “structure decision making within certain bounds” (2011, p. 50). The agency of platform users is thus shaped around algorithmic goals and, to some extent, constructs them because personal data are used to sustain the business model and to create personalized content, advertisements, and services. As Park et al. (2018, p. 1321) write: “[I]ndividuals’ voluntary actions in digital media consumption become constitutive of the very structure of which they are a part.” Some scholars like Klinger & Svensson (2018) point to the agency of humans, such as programmers and developers, in the input phase, while Rutz (2016) highlights the non-human agency of algorithms.

Platforms and algorithms are surrounded by the more optimistic discourses on participation (Vaccari & Valeriani, 2021) as devices enhancing agency and enabling activism. On the other hand, a significant and recent body of work accentuates the power of structures to exercise algorithmic control (Griesbach et al., 2019), accumulate platform power (Terranova, 2022), exploit user activity and surveil (Zuboff 2019), or shape platform users’ choices in the consumption of culture (Higson, 2021).

REGULATORY PLATFORM STRUCTURES

As sets of rules and resources, institutions are “structured social practices that have a broad spatial and temporal extension” (Giddens, 1982, p. 9). They give “solidity’ across time and space” (Giddens, 1984, p. 24). From a broader perspective, institutions have three elements: regulative, normative, and cultural-cognitive (Scott, 2014, p. 60). In this section, we will focus mainly on the regulatory structures of European bodies that represent “the political-institutional component of European governance”. Regulatory interventions aim to structure the behavior of particular actors, but also has an enabling, agency-generating component. At the same time, regulation is also a political process, where the agency of these actors allows for the engagement in these political struggles.

Several authors have pointed to the relationship between institutions and platforms, or conceptualized algorithms as institutional practices (Napoli, 2014; Park et al., 2018). For instance, Van Dijck (2020) argues that institutions are crucial in the process of negotiation with platform corporations about public values. Van Dijck suggests “Governing digital societies in Europe takes a serious effort at all levels, from local municipalities to national governments, from schools to collaborating universities, and from city governments to the European Parliament” (2020, p. 3). Platform corporations seek to reduce the role of European (political) and other public institutions over the market (Gorwa, 2019; Törnberg, 2023). They allocate resources to political strategies such as lobbying: “[...] platforms seek to exploit institutional weaknesses in order to break out of the control of the state” (Törnberg, 2023, p. 5).

European (political) institutions have recently created two instruments for regulating platform corporations. The DSA (Digital Services Act, 2022) package – together with DMA (Digital Markets Act) – which amends and complements the eCommerce Directive (2000) is at the time of writing being implemented by the member states, and should be fully in force from March 2024. Its subject matter are intermediary services in the internal market. The DSA provides layered obligations for various kinds of online providers with the largest number of cumulative obligations applying to Very Large Online Platforms (VLOPs) and Very Large Online Search Engines (VLOSEs) which have a monthly average of 45 million plus active users in the EU.

Intermediaries must inform their users about any tools used for the purpose of content moderation, including algorithmic decision-making. At least once a year, they have to report on their actual moderation practices, including whether the order or notice came from a national authority, a trusted flagger or an automated system and the specification, indicators of the accuracy and error rate of such systems. The DSA does not allow for entirely automated decisions on users’ content. Platforms must ensure that the decisions on complaints

(about demonetizing or removing content, suspending or terminating account) are inspected by not exclusively automated means.

On 18 April 2023, the European Commission launched the European Centre for Algorithmic Transparency (ECAT) in Sevilla as an EU Commission's Joint Research Centre (JRC). Its task is to help enforce the DSA. At ECAT, an interdisciplinary team of around 30 data scientists, artificial intelligence experts, social scientists and lawyers will technically analyze and evaluate relevant program routines of VLOPs and VLOSEs. At the time of writing, the AI Act is in its final negotiations between EP and Council. It strives to establish the world's first-ever rules for safe and transparent AI. Article 4ad states:

transparency' means that AI systems shall be developed and used in a way that allows appropriate traceability and explainability, while making humans aware that they communicate or interact with an AI system as well as duly informing users of the capabilities and limitations of that AI system and affected persons about their rights (AI Act, EP Mandate, 2023).

STRUCTURE, AGENCY AND ALGORITHMIC ASSEMBLAGES

Platforms and algorithms are often framed as constituting opaque structures based on mechanisms that are not completely transparent. They are seen as black boxes (Pasquale, 2015), as the invisible hand(s) influencing culture, politics, and other fields. Courtois and Timmermans (2018) provide us with a useful conceptual model to look under the hood of platforms and algorithms utilizing structuration theory. Their approach combines media effects research and (critical) political economy of online media, that: "[...] treats algorithmic governance as a dynamic structuration process" (Courtois & Timmermans, 2018, p. 2). Courtois and Timmermans present a tripartite of structuration for algorithmically governed platform environments that involves three types of actors that interact with one another: platform owners and developers, platform users, and machine learning algorithms dynamically interact, while they all possess agentic and structural characteristics (Courtois & Timmermans, 2018, p. 2).

Platform users "exercise agency within the boundaries that a platform provides: they roam within a platform's architecture that is governed by protocols, default settings, and algorithms" (Courtois & Timmermans, 2018, p. 3). The authors notice that platform users have the ability to perform different types of resistance to algorithms, such as figuring out the mechanics and acting accordingly, thus exercising agency beyond platform protocols (Courtois & Timmermans, 2018, p. 12). Perspectives of platform owners and developers, who develop and

refine platform mechanics and business models, then allow “to understand their internal structures and consequently their actions” (Courtois & Timmermans, 2018, p. 4). It means taking into account the sequence of goals (for instance, how the revenue is generated) that

forms the internal-structural backdrop against which platform owners and developers exercise agency. This agency relates to a wide array of choices including the platform’s interface design, its default settings, the protocols that govern it, what (meta)data are generated, and how these data are processed (Courtois & Timmermans, 2018, p. 3).

Finally, algorithms, and the machine learning versions shape platform users’ choices and execute goals built into platforms by developers/owners. Courtois and Timmermans argue that it should be possible “to construct informed assumptions on the mechanics of algorithms by considering the economic and technological logics that pressure platform owners and developers” (2018, p. 5). It is important to note that recent debates informed by Latour’s actor-network theory (Greenhalgh & Stones, 2010) have enriched structuration with non-human agencies, thus allowing scholars to consider the relationships between human and technological actors, such as algorithms (Courtois & Timmermans, 2018, p. 3). Combining these two theories is a valuable approach (Rose et al., 2005) to understanding platform landscapes. While structuration theory sees technology only as a tool employed by human agents, the actor-network theory (Latour, 2005) understands technology as actors (or actants) in their own right, and inseparable from society.

Our understanding of algorithmically-governed platform environments lies in a balance between structuration theory and Latour-inspired models, as discussed above, that conceptualize algorithms, platforms, and users as assemblages. In our analysis, we employ the notion of (algorithmic) assemblages as one of the sensitizing concepts, that help us to understand the interdependencies between actors. DeLanda theorizes assemblages are “wholes whose properties emerge from the interactions between parts” (DeLanda, 2006, p. 5). For instance, Fisher understands algorithms as “a whole socio-technical assemblage of people, technologies, practices, sites, and knowledges” (2022, p. 9), while Cellard (2022, p. 990) sees algorithms as sociotechnical assemblages and is concerned with algorithmic transparency: “At the end, what has to be negotiated and governed is not only a digital object but a set of protocols and procedures made of organisational habits, legal rules, analog artefacts and technological expertises” (Cellard, 2022, p. 996).

METHODOLOGY

The empirical part is a qualitative analysis of future scenarios that uses methods of futures studies, a field which can be defined as “the systematic study of possible, probable and preferable futures including the worldviews and myths that underlie each future” (Inayatullah, 2012, p. 37). For the data gathering, we used the adjusted Delphi method which is a futures studies’ method for future scenario-building and forecasting. According to Gordon (2009, p. 4), the Delphi method is grounded in a “controlled debate” which allows for the establishment of consensus among experts, through a series of iterations. In our case, we adjusted the Delphi method into a 3.5 hour face-to-face scenario-building Delphi+ workshop, which approximates to mini-Delphi (Pan et al., 1996). (For more on data collection, Delphi+ method and futures studies, see the introductory article of this special issue).

We analyze three corpuses of text, namely: (1) The Delphi+ workshops output in the form of a database of scenario cards (SCs), (2) the transcriptions of the discussions during our workshops and (3) the authors of this text also wrote future scenario essays (FSEs). The FSEs were part of an EUMEPLAT future scenario writing project, and they were all produced before the data analysis. The usage of these FSEs added an auto-ethnographic dimension (Ellis, Adams & Bochner, 2010) to the data gathering process. The Delphi+ workshops together with future scenario writing project resulted in a total of 37 scenarios (see Table 1).

Table 1. Overview of the Delphi+ workshops, scenario cards, future scenario essays, and thematic code in the context of the theme ‘algorithms and choices’ [a&c]

Delphi+ workshop location (and Code)	Scenario Cards—SC[a&c]
Sofia 1 (Si)	6
Malmö (M)	9
Rome (R)	7
Sofia 2 (Sii)	8
Total SC	30
Future Scenario Essays	Future Scenario Essays—FSE[a&c]
Total FSE	7
Total SC + FSE	37

For the interpretation of the data, we used a qualitative research approach and coding methods inspired by the grounded theory method (GTM) (Bryant & Charmaz, 2007; Glaser & Strauss, 1967). We followed the GTM’s coding procedure, but we have not adopted the method’s approach, as a whole, because our aim was not to generate a new theory. To support the qualitative analysis,

we performed a quantitative content analysis on 37 scenarios, identifying the frequency of actors (clusters of scenarios highlighting the role of a particular agent or actor) and the European dimension of each scenario (see Table 2). The actors are concepts that emerged from the content analysis of our data, which were enriched by the theory presented above.

Table 2. Overview of the actors in the scenarios

Type of actor	Frequency (N=37)	European dimension
Algorithms	15	2
Platform users	5	1
Platform corporations	7	4
Institutions	10	9

Although the GTM's procedures can vary and some scholars attribute methodological eclecticism to it (Charmaz, 2009, p. 134), the multiple and multilevel coding is at the core of the method (Charmaz, 2006, p. 45). In order to support the coding, we created a future scenarios map to better visualize relationships between scenarios and dominant categories (see Figure 1). The coding was driven by the theoretical framework presented in the previous sections, which provided sensitizing concepts (Blumer, 1969) for the analysis. The sensitizing concepts we employ come from structuration theory (Giddens, 1984) and its more current applications, like structuration of algorithmically governed platform environments (Courtois & Timmermans, 2018), and from assemblage theory (DeLanda, 2006), which helped to acknowledge the multidimensional relationships between actors. Additional sensitizing concepts were inspired by human-centric vs. tech-centric approaches (Degeling & Berendt, 2018; Sigfrids et al., 2023) to AI governance, which helped to further structure and consolidate the analysis.

To support and display the results of the analysis, we used the method of semantic mapping, which helped us to visualize the categories that we identified in the scenarios (Freedman & Reynolds, 1980; Carpentier et al., 2023). We visualized the categories and clusters of scenarios after the coding procedure across an horizontal agency (structure) and a vertical tech-centric—human-centric axis (see Figure 1). This visualization proposes a two-dimensional and simplified overview of coding that helps navigate the data. Simply put, semantic mapping is “a structuring of information in graphic form” (Johnson, Pittelman & Heimli, 1986, p. 779), offering a visual arrangement of meaning that facilitates a more direct access to the clustering and presentation of data. Furthermore, a semantic map enables a spatial organization of the connections and interrelations between categories or clusters of meaning that makes the presentation of the analysis coherent and comprehensive (Johnson et al., 1986, p. 779).

We use an updated conceptual model of actors in structuration processes of platform environments (Courtois & Timmermans, 2018), which consisted of platform users, algorithms, platform corporations and institutions. Here, a number of clarifications need to be made: (1) In the case of machine learning algorithms, we labeled these non-human actors “Algorithms” because our data do refer in most cases to algorithms in general (and not a specific type); (2) Platform developers and owners will be labeled “Platform corporations” because our data were not that much concerned with the role of individuals behind platforms but refer to them as entities or structures. (3) With respect to Cellard’s (2022) specific mention of legal rules in the workings of algorithmic assemblage (as outlined in one of the theory sections), and to the concepts that emerged from our data, we add a fourth type of actor, namely “Institutions”.

FUTURE SCENARIOS ABOUT ALGORITHMS

Algorithms are structuring mechanisms of platforms that structure behavior, content, and feed (in a reciprocal relationship with user data)¹. As technological actors, they enter in relationships with platform users, but algorithms have the capacity to act on their own, with their non-human agencies. In the more tech-centric imagination that the Delphi+ participants have created about the future in their scenarios, algorithms are considered to have more weight in 20 years’ time, not only in the cultural or political field, but also in the medical field, meaning more areas of capitalist production will be affected.

ALGORITHMIC TRIBALISM

According to the analyzed scenarios, one of the negative effects is the amplification of polarization – or acceleration of filter bubbles’ isolationism – resulting in what we call algorithmic tribalism. In this group of scenarios, algorithms are imagined as enforcing conspiracy theories through recommendation systems, and gathering tribe-like communities, which is a reference to the US Capitol Attack in January 2021 (Delphi+ participant 1). In a more positive variation, subcultures and cultural scenes will be created around certain algorithms (Delphi+ participant 11) – the scenario emerges here via the vocabulary of post-subcultural studies (Bennett, 1999) and cyber-punk literature (Attebery, 2020, p. 233).

¹ But algorithms are positioned on our map on the side of agency, because the scenarios mainly accentuated their agentic characteristics.

ALGOSSISTANCE

The second cluster of scenarios, entitled *Algossistance*, addressed the idea of algorithms navigating better consumer or political choices for humans. It included a particular scenario named “Algorithm caretaker” (SC[a&c]1), that imagined algorithms as personal assistants, while other scenarios predicted algorithms that can assist in better decisions for climate mitigation (SC[a&c]2) or take the role of social workers (FSE[a&c]6). This cluster of scenarios was framed as positive (Delphi+ participant 2).

One particular scenario called ‘Algossistance’, which will serve here as case example, emphasized the entanglement of humans and non-humans. ‘Algossistance’ can be installed into the human body in the form of a microchip helping with everyday decision-making. For instance, it can assist in common activities like buying ice-cream, by “activating algossistance via the power of thought” (FSE[a&c]1). In line with the transhumanistic and neurofuturistic traditions (Gray-Hammond, 2023), “algossistance” establishes feedback between the human mind and technology. This scenario predicted that the EU would become a technological utopia by the 2050s. According to the scenario, that puts into motion the workings of the assemblage and closely interacts with all other actors (institutions, platform corporations and users), the European Commission was the first institution to approve implanting these algossistance microchips into human bodies. The EU saw it as economic opportunity:

Europe could re-establish itself as a cutting-edge technological utopia that acts ahead of its global competitors. And it resonated well with the European tradition of public-private partnerships as the algossistance microchip was developed by ALGINO, a company jointly funded by the European Union and private capital (FSE[a&c]1).

HUMANIZATION OF ALGORITHMS

The idea of the *humanization of algorithms* has an ethical dimension, as it concerns the possible need of protecting algorithms (in their rights to dignity, for instance) and recommendation systems as persons or animals (FSE[a&c]6). The need in this scenario arises from the anticipation of a closer relationship between humans and algorithms, also in romantic relationships. But algorithms may become personalities with faces, which provokes questions concerning trust in connection to behavioral interfaces, which is the domain of another actor, platform corporations (more accurately, of marketing departments and designers and programmers behind platform interfaces—see later). One Delphi+ participant indicated that interfaces are part of the platforms’ business model:

The algorithm itself would probably be an infrastructural thing, but the branding which brings you to that particular choice of algorithm with that particular set of constraints, that's going to be very much a marketing thing (Delphi+ participant 3).

FUTURE SCENARIOS ABOUT PLATFORM CORPORATIONS

Platform corporations as actors are involved in the structuration process of algorithmically driven environments. Although Courtois and Timmermans' model (2018) accentuates human agency in the input phase by platform owners and developers, in our case this type of actors takes action as whole platform power structures rather than human individuals representing the companies. This type of actor is largely tech-centric and related to the accumulation of power.

ACCUMULATION OF PLATFORM POWER

This cluster of scenarios (Delphi+ participants 4 & 5; SC[a&c]3) predicts widening gaps in society enforced by platforms. For example, one idea is there will be only two classes, "Masters and Users": "People who are controlled and people who produce AI. It is a crucial moment in the lifespan of a civilization now" (Delphi+ participant 4). This scenario emphasized, in a very neoliberal-technological fashion, the importance of individual skills, which allows for growth and upward mobility. Also, asymmetries of platform power will lead to class distinctions in art consumption (represented by highbrow vs. lowbrow art). But this time, it will be mass-AI art vs. high human-produced art (Delphi+ participants 4 & 12; SC[a&c]4). The role of Europe in these processes related to AI development will be rather passive: The "EU will become [a] passive spectator" (SC[a&c]6), or "left behind by China" thanks to non-strategic regulation (Delphi+ participant 4).

PLATFORMIZATION OF STATE

The accumulation of platform power can be mobilized by the state, leading to the *platformization of the state* (Bratton, 2015). One essay (FSE[a&c]2) imagined Europe adopting a social credit system as in China. This state-like platform, "European Social Credit System" (which was the title of one FSE), would foster trust, transparency, and cohesion. The system would be based on the Social Credit Quotient (SCQ) and assess individuals' behavior. Although it would mean stronger structures, all-encompassing surveillance and less individual human agency, the scenario is framed as positive: "In the pursuit of an idealized society, dissent and individuality may be suppressed, as the system promotes

conformity” (FSE[a&c]2). Platformization of the state posits opportunities for more effective governance (Delphi+ participant 1 & FSE[a&c]3), but also challenges for maintaining the human agency in the structuration processes of platform environments.

FUTURE SCENARIOS ABOUT PLATFORM USERS

The perspective of the platform user scenarios is human-centric, focusing on communities, users, and on the good of society. This type of actor cannot be separated from the workings of the assemblage and interacts with other actors. The scenarios in this cluster highlight human agency in deliberative processes in platform structures, envisioning downscaling of platform environments, or of a partial return to traditional societies.

DOWNSCALING

The idea that any resistance against platforms and algorithms will have the form of partial renunciation of digital communication, and exile “away from keyboard”, featured repeatedly in the discussion. However, the return to offline life cannot be accomplished in its totality, according to the Delphi+ participants (SC[a&c]7). For instance, Delphi+ participants 2 & 3 entitled the scenario “Cabin in the Woods” with the full awareness, that even when you have the opportunity to withdraw, you cannot completely escape:

Off grid is the old cliché, but it’s a recognition that you can never be completely off grid, but a much greater literacy around the exposure of being on grid and a lot more gradient of choice (Delphi+ participant 2).

The imagination about *downscaling*, and localization, was accentuated in the scenario “Local is the New Social” (FSE[a&c]4), which will stand as a case example here. It worked with the idea that in the future online sociality will collapse, as a consequence of massive platformization. For instance, VLLMs (Very large language models) will collapse, and algorithms’ hallucinations will intensify, simultaneously polluting public discourse. In the positive prospect, platform corporations will understand that optimizing digital environments for maximum profit, extracted from users, is not sustainable. In the aftermath, the platform environment will return to a protected sphere that is more trustful and private: “By 2043, ‘local is the new social’. It is friends and colleagues, our friendly neighborhood baker, hacker and information broker” (FSE[a&c]4). Also, algorithm learning will downscale to more sensitive open source LLMs “so that

they run on my laptop” and can be trained on users’ interactions “from bills to love letters” (FSE[a&c]4).

PARTICIPATION+ IN DELIBERATIVE PROCESSES

The cluster *participation+ in deliberative processes* imagines a higher degree of participation in decision-making processes of platform structures (therefore the “plus” in the title), and is related to the issue of regulation, thus to the institutional level (see also below). One scenario (FSE[a&c]5), that will serve here as a case example, addressed the need for a direct user-platform relationship without barriers from national legal frameworks: “Maybe the solution is not to transfer power from the platforms to any national entity, but rather to the users themselves” (FSE[a&c]5). This is connected to the issue of national and supra-national regulations of global platforms, that are constructed here as restraining. The realization of this scenario is dependent on national and supranational political and law-making institutions, but also on platform corporations’ willingness to open their structures for participation (as Meta did with their Oversight Board).

FUTURE SCENARIOS ABOUT INSTITUTIONS

The last type of actor in the algorithmic assemblage are institutions, mainly European (political) institutions. This cluster includes the focus on how rules, policies and practices are transferred between the supranational EU and member states, but also discussions about algorithmic literacy, transparency and regulation. Institutions-as-actors are considered human-centric, as they aim to maximize the agency of platform users.

ALGORITHMIC LITERACY

The need for improvement in *algorithmic literacy* and education was repeatedly mentioned, even though in most cases only vaguely. One scenario titled “EU Justice League of Literacy” (Delphi+ participant 6) though was more detailed in its predictions. It accentuated the need for supranational cooperation in an educational organization powered by all EU member states. Its goal would be to “find an easy way to explain to people what algorithms are doing to their lives and how they affect their choices”. Establishing such a governmental body would mean the transfer of powers from the national level to the supranational-EU level – it would allow the “European Justice League of Literacy” to surpass the individual education systems in each country. In this scenario, the

present EU legislation is framed as constraining (or more precisely, EU legislation is constrained by the member states not having conferred the competence for education to the EU).

ALGORITHMIC TRANSPARENCY

The issue of algorithmic literacy is related to *algorithmic transparency*, which creates another cluster. Algorithmic transparency was often framed as desirable but “hyper optimistic” and “unrealistic”: “We have had cars for a hundred years, and how many per cent know how this engine works” (Delphi+ participant 5). But algorithmic literacy will not solve the problem alone – and once again the workings of the assemblage were activated. Scenarios (Delphi+ participants 1 & 5) expressed the need for acceleration of institutionalization and European Unionization to create EU bodies and agencies (e.g., ECAT). A workshop participant described these bodies as “realistic means for mitigation and resistance [...] For example, a new agency for algorithmic control, risk assessment, partnerships, quadruple helix networks” (Delphi+ participant 1). Among the measures that could contribute to better transparency are policies for global platforms to make their data and algorithms available and transparent, also readable and understandable: “Access to the ocean of data is not like you’re transparent” (SC[a&c]8; Delphi+ participant 7).

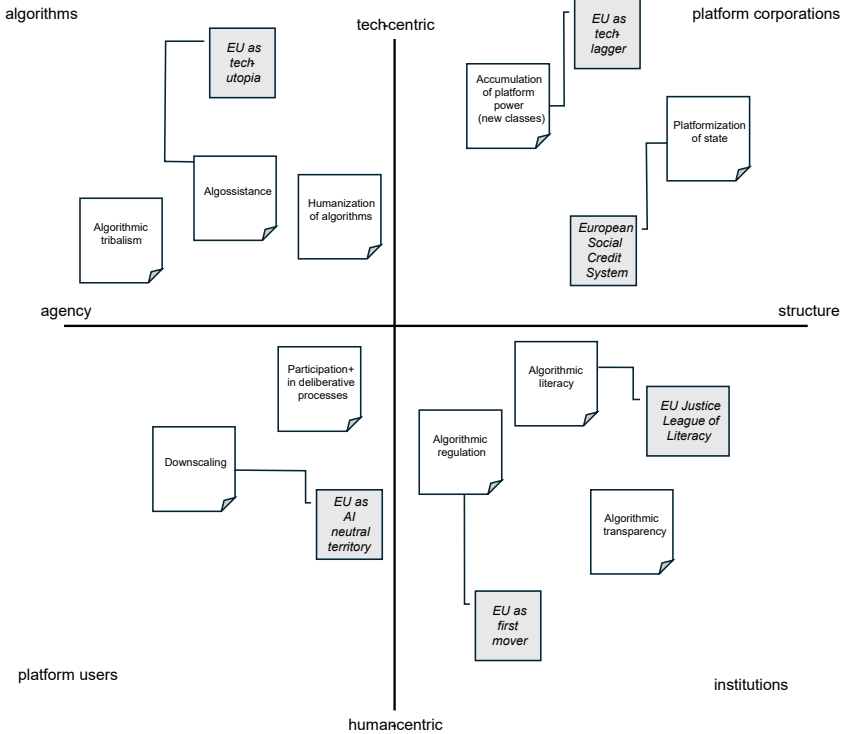
ALGORITHMIC REGULATION

This cluster of scenarios concerns the escalation of *algorithmic regulation* in the EU. For instance, by enforcing the GDPR, data protection officers will stop government agencies from using Facebook, TikTok and other social media platforms based outside the EU (FSE[a&c]4). The same scenario predicts that VLOPs will—after many lawsuits against online trolls and platforms over content moderation—need to change their upload filters from negative to positive, “allowing only content with license or approval to go online”.

Other scenarios worked with the idea for algorithmic regulation that would turn off recommendation systems, for instance, during elections, so the political choices of platform users are not affected (SC[a&c]10; Delphi+ participant 8). It would be the responsibility of a state or EU’s institutions. This group of scenarios takes a very human-centric position that does not consider other types of biases. In these scenarios, the EU is constructed through institutions and its policies as “first-mover” (SC[a&c]9). Although some of its decisions in regulation are not strategic (Delphi+ participants 4, 9 & 10), which may consequently lead to “disappearing as a political entity” (Delphi+ participant 10).

In Figure 1, all future scenarios are visually represented.

Figure 1. Future scenarios map



Key: White squares designate scenarios related to actors, while grey squares designate the EU or European dimension of each scenario

CONCLUSIONS

The article discussed structure and agency in varied algorithmic imaginaries that revolved around European media platforms, and how the future is constructed in these imaginaries. The analysis of the future scenarios operationalized four actors shaping these imaginaries—algorithms, platform corporations, platform users, and institutions. We suggested that the relationship(s) between algorithms and human choices in platform environments are complex and multidimensional, and that therefore we must understand platforms as forms of collective organizations of interactions across various actors.

The roles of these actors are accentuated to assorted degrees in each of these imaginaries, giving rise to a diversified landscape in which articulations about what constitutes a desirable platform future antagonize each other. In this sense, it is important to note that the future of algorithms and choices in Europe is not

independent of larger visions of optimal political futures. Seeing platforms as techno-social assemblages allowed us to point out the workings and interdependencies of actors in the assemblage. However, some particular actors were more visible. The algorithmic imaginary was mainly centered around two actors with higher frequency—algorithms and institutions. The existence of algorithms was understood as a principle in imaginaries, where the technologically deterministic tendency towards algorithms was evident, while other actors (platform users, for instance) are seen as a more adaptable factor. The relationship between algorithms and institutions had a partly techno-pessimist perspective, where algorithms represented the potential threat of an “alien”, which needs to be tamed, while institutions were seen as a protective force from “non-human” actors. But algorithms are also seen as offering a prospect of effectivity and playing a role in de-institutionalization or re-institutionalization processes, as they create new contexts, as Mendonca et al. (2023, p. 19) writes: “They perform agency and interact with humans, and the outcomes of these interactions modify society’s structure, in turn creating new political orders.”

Scenarios related to platform corporations emphasized the role of strong structures and were connected to the centralization of power and capitalist modes of production. They are seen to potentially lead to systemic configurations allowing increasing levels of surveillance and control and societal divides, but also higher effectiveness of governance. The algorithms cluster promised prospects for more effective human minds, but also the danger of the loss of free will is mentioned. What these scenarios did not mention or consider, was that technologies are not universally accessible – even societal divides were constructed as a matter of individual skill, not access or systemic configurations. Also, the environmental impact of technologies or ecological sustainability of these technologies were not mentioned.

The platform users’ scenarios worked with the idea of the sustainability of platform environments and with increasing levels of participation for users (thus decreasing levels of control). The institutions’ scenarios accentuated maximizing human agency and aimed at society, community, or individual users. Institutions were seen as protective of users and humanism was valued in these scenarios, although some framed it as weakness which would marginalize Europe and the EU in the context of economic and technological developments. The dimension of European-ness in the algorithmic imaginaries was constructed mainly through normative aspects and institutions, and was deemed much weaker in the context of other actors.

Several authors have pointed to asymmetries and imbalances in the conceptualizations of algorithmic imaginaries. In this sense, Schulz criticizes the current conception of algorithmic imaginaries or folk theories (see Ytre-Arne & Moe, 2021), “primarily concerned with the users’ perspective” (Schulz, 2023, p. 647),

as lacking and forgetting the perspective of designers and programmers. The imaginaries of designers and programmers of platform architectures are under-represented in our model. They were only indirectly mentioned in relation to the interface designs of platforms (for a broader context see the discussion on the humanization of algorithms scenarios. We argue that our analysis has contributed to more balanced conceptualizations of algorithmic imaginaries by considering the perspective of institutions, and situating them in the model. However, it is fair to note that the institutional settings, in which algorithms exist are not entirely omitted in algorithmic imaginaries, as Bucher (2018, p. 150) says: “[...] ‘ordinary’ people and institutions are speaking and thinking about algorithms”.

Algorithmic imaginaries undoubtedly participate in shaping the routines and the processes of decision-making in everyday life. Algorithmic imaginary is viewed as a user’s competence—a specific set of skills and knowledge—that is shaped by both unguided, informal processes (including stereotyping) and potentially by formal inculcation (for example, as part of media education). Algorithmic imaginaries should be a prominent topic for further research, together with their contribution towards the formation of users’ projective imaginations of their future actions and choices.

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