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## **Governance of Things: AI & DAOs in Politics - Utopia or Dystopia?**

**Existing digital technologies - AI, blockchain/DLT, DAOs - already enable completely autonomous decision-making systems. What would these look like if applied to politics? How could they be embedded in social systems? And how should we walk on the fine line between utopia and dystopia?**

### **1. Introduction**

According to a 2019 study by the Spanish Center of the Governance of Change, a quarter of Europeans would prefer political decisions to be made by AI rather than by flesh-and-blood politicians (Rubio / Lastra 2019). At least from the perspective of social sciences and humanities, a development of this sort would mark the end of the increasing mechanization of social processes, for which "digital" technologies such as AI and distributed ledgers (DLT) are primarily responsible.

For quite some time, social sciences have been discussing the influence of digitization on political decision-making. Due to the increased use of algorithms and methods of machine learning in the context of "algorithmic governance" and "automated decision making" (ADM) in practical politics, questions arise concerning the legitimacy and ethical justifiability of such advances (Wagener 2021). The same is true for application scenarios for distributed ledger technology, such as the concept of "liquid democracy" (Bastgen / Winkler, 2013), which is associated with the elimination of performance deficits of representative democracy through the implementation of automatic mechanisms for execution of the will of the voters, up to and including an "imperative" of the mandate (van de Sande, 2015).

For some time now, smart contracts have been used in industrial and business processes to automatically execute the consequences of agreements made in advance on the basis of logical "if-then" causalities. An integrated system consisting of a large number of these smart contracts makes

it possible to map entire organizations with autonomous, fully mechanized, decentralized decision-making structures, so-called "Decentralized Autonomous Organizations" (DAOs)

Transferring this principle to politics, especially to state institutions, seems conceivable in theory. In conjunction with the use of algorithms, machine learning and AI, powerful autonomous systems could be created that would fundamentally change the nature of the state and the way society makes decisions. However, a corresponding use of these technologies in the political sphere raises new questions regarding legitimacy and representation. Thus, social and political sciences - following the much-cited concept of the "Internet of Things" - would have the task of sketching and evaluating the guidelines for a possible implementation of this "governance of things" and its democracy-compatible design: Accordingly, what are the challenges to democracy and how can we address them? To what extent is it legitimate to expand the technical achievements and drive forward the digital transformation? And how can civic participation and a human face of statehood be guaranteed in the process? Ultimately, such considerations inevitably lead to the fundamental question of the relevance of human will emergence in the digital age: Which future is desirable and which developments are leading us into a dystopia?

This article attempts to shed light on the technical nature of such an independent political system. To do this, the article first looks at the approaches taken to date towards the social utilization of algorithms and DLT in order to develop a vision of a political DAO as a synthesis. Based on this, the challenges for the legitimation and the guarantee of civic participation as well as the theoretical positioning of democracy are discussed. The article is concluded by a critical evaluation of this discussion.

## **2. Socio-Technical Foundations**

### **2.1 Algorithmic Governance and AI Governance**

For some time now, the use of data-based "digital" technology to supplement or even completely replace human political decision-making has been increasingly discussed under the term "algorithmic governance" (Yeung, 2018; Katzenbach / Ulrich, 2020). Following Laurence Lessig's (Lessig 1999) dictum "code is law" (also: "law is code", cf. Hassan / de Filippi, 2017), this approach could be described as automating the execution of pre-defined (governmental) rules. The application of the underlying "if-then" principle borrowed from computer programming ("if this ... then that...", "IFTTT") is based on the assumption that previously defined - and legitimized - decision patterns can be applied to subsequent situations. The execution of pending decisions can then ideally take place autonomously, without necessarily requiring further human intervention.

Recourse to AI - understood as the use of autonomous, self-learning systems - again fundamentally changes the framework conditions of algorithmic governance. As long as such intelligent systems learn independently, subsequently resulting in their decisions no longer necessarily corresponding to patterns and rules defined in advance by humans, and instead acting autonomously on the basis of the processed knowledge and constructing their own standards - generally referred to as "AI governance" (Kuziemski and Misuraca 2020) - the question arises as to how these processes can be legitimized in the democratic state. This is by no means a purely theoretical problem. Such systems are already regularly used in state and political practice, for example in labor market and domestic policies, in policing, or in underpinning legal processes.

Basically, three different levels in the degree of autonomy can be differentiated according to increasing data intelligence ("3A", Wagener 2021): A1 - Analysis, A2 - Automation, and A3 - Autonomous Action:

A1 - Analysis includes all tasks of data collection and data interpretation, creating the basic conditions for functioning intelligent systems as well as for analytical decision making. Data collection and analysis can be automated, but not decision making and execution. Mostly traditional knowledge and data management systems.

A2 - Automation involves the execution of specific tasks, usually detached from human intervention, mostly autonomous, but according to predefined conditions. However, these sequences of actions are not necessarily to be seen as irrevocable automatism; humans remain in their role as the final decision-making authority. In practice, this is usually handled in such a way that the person in charge is allowed to act against the consecutive rational recommendation of the system, but this deviation must then be documented and justified.

A3 - Autonomous action encompasses the ability of a system to act autonomously, even without "feedback", without human intervention, but on the basis of agreed "action maxims", with its own autonomous processes. This stage can be considered AI governance in its purest form. A possible human veto has merely the character of a quality control, but does not change the character of the system as essentially autonomous and independent intelligence.

The various levels of algorithmic governance are already used in practice to varying degrees (cf. Wagener 2021). A combination with DLT-based processes does not generally take place, but would be possible in principle.

## **2.2 Distributed Ledger: Blockchain, Smart Contracts and DAOs**

Recourse to DLT methods is primarily linked to on the cryptocurrency Bitcoin, where the "blockchain" is used for the decentralized, transparent and immutable recording of data on transactions between network participants. A transaction must always be confirmed by the other network participants. The result is stored immutably on the "ledger" and the thus newly formed blockchain thus is distributed to the participants.

Quite significantly, the decentralization of the organization leads to the elimination of the mediating central body, the "intermediary" (for example, an overseeing government institution, such as a central bank, or a central banking system). This is not only seen as efficient and cost-relevant - after all, the middleman now no longer "earns" from a transaction and blockchain peers can share this cost advantage among themselves - but also changes the power structure. It is not uncommon to speak of a "democratization" (Piscini et al, 2016), since the "legitimization" of transactions is then no longer secured by a central authority, which may have its own interests in mind, but by the mass of network members.

Based on the original blockchain logic, areas of application for DLT developed beyond financial scenarios, in particular through so-called "smart contracts": These are technical transaction protocols that monitor compliance with previously defined contract provisions and autonomously and mechanically execute the agreed consequences - also according to the IFTTT principle and analogous to the "code-is-law" dictum (see 2.1.). Human intervention, for example in the event of violations of contractual rights by one party, is thus no longer necessary.

A system consisting of a large number of these smart contracts makes it possible to map entire institutional organizations with autonomous decision-making paths - the DAOs already mentioned at the beginning. These have already been tested and established in the financial sector for some time in order to participate in the economic cycle as independent actors, detached from human intervention (van de Sande, 2015). DAOs are controlled in an automated way based on conditions set by the members or participants through a voting process in advance of decision-making situations (Chopan, 2022). In most cases, submitted proposals are decided by votes usually weighted by cumulative ownership and capital contributions, subject to compliance with a certain quorum, although other voting principles (e.g., by acquired reputation) are possible (Arsenault, 2020).

In principle, this also makes it conceivable to transfer the principle of DAOs to politics, which is repeatedly supported by corresponding demands, particularly in the USA (Sergeenkov 2022). Under the heading of "liquid democracy," various forms of mandate-based democracy are discussed, mostly with a focus on stronger individual, direct civic participation. One of the concepts circulating is "delegated voting" (Nitsche, 2014). According to this principle, eligible voters can flexibly decide whether to exercise their right to vote themselves in a specific decision-making situation or to transfer it to a delegate, for instance because the delegate has the expertise required in this specific case. For this purpose, the corresponding delegation process is documented in a blockchain. Furthermore, imperative mandates could also be created and monitored in this way. In combination with smart contracts, it is possible to create an automatism that mandatorily executes the aggregated will of the voters, in that the actual exercising of the mandate is no longer within the control of the delegate, but the binding of the content recorded in the blockchain leads to a mechanization of the vote that can no longer be influenced. In many democracies, however, this would probably stand in conflict with the principle of the free mandate, which is regarded as indispensable and which subjects the delegate only to his or her own conscience (Seckelmann 2014). Ultimately, such an understanding of democracy would have to lead to the fact that - provided the technical feasibility of these elaborate procedures - there would actually be no need for delegates at all, since all decision-making processes could be decentralized (Waldmann, 2016).

### **2.3 Synthesis: Political DAOs as Intelligent, Self-learning Systems**

The main criticism of delegated voting is that it is not practical enough and lacks efficiency. After all, it is hardly possible to keep track of and coordinate the large number of issues and different delegates. The integration of the "superdelegates" created by vote accumulation into a system of checks and balances and their accountability to the voters was also considered problematic (Seckelmann 2014).

The use of DLT would nevertheless be quite suitable for reducing the fundamental problems of voting delegations, because embedding them in a digital system should contribute to greater clarity on the one hand, while on the other hand a recording of the individual voting behaviour of the delegates in a generally accessible and unchangeable "blockchain" would lead to greater transparency and accountability.

Indeed, a major problem of today's political systems and the respective decision-makers is likely to be the increasing complexity of political decisions as well as - at least in the Western world - the generally growing social fragmentation and polarization. This raises the question of the extent to which traditional, purely human decision-making processes are still contemporary - given the steadily growing performance of digital technologies that are applicable in this context. And: Doesn't human leeway for decision-making always inevitably lead to a "bias," a human-induced "imbalance" that favours one side over another on the basis of traditional patterns of behaviour?

There is much to suggest that the use of digital technologies could rectify at least some of these problems, as it would radically streamline the political decision-making process (Owen 2015; Atzori, 2017). While the formal voting process as well as the fixation of the decision made would have to be mapped via DLT and smart contracts, the use of AI and machine learning methods could be used to provide the basis for decision-making by collecting and analysing the data and then ensure "absolutely rational" decisions by the system (Atzori 2015). AI would thus be relevant for the decision input; DLT methods could be used for the decision execution, the output. In such a system, there would then be no need for "intermediary" mandate holders, who would possibly distort the strictly rational decision-making process through human influence. The result would be an absolutely autonomous political organization - a "state DAO" - which would aggregate the will of the electorate by means of upstream voting and, on the basis of the database thus created, autonomously answer detailed questions through the use of iterative learning methods. The voters would thus provide the guidelines and framework conditions through their voting behaviour, but the AI would be responsible for the political implementation, by calculating the most reasonable decision from the available data (based on pattern recognition via "unsupervised learning") and by optimizing the previously defined public welfare equation (e.g. using "reinforcement learning").

What may sound like pure science fiction in a social context is already much more advanced in an industrial environment. So-called "DAGs" ("Directed Acyclic Graphs"), which for some mark the next development stage of DLT, can be used to solve typical problems of DLT, such as the high consumption of energy and time resources, by turning away from the complex mining processes known from Bitcoin and Ethereum. Such approaches, as represented in various forms by IOTA, IOTChain or DAGCOIN, for example, have so far been aimed primarily at the "Internet of Things", where transactions - transparent, chronological and immutable - between individual machines and devices are to be mapped in a decentralized manner.

If machines communicate with each other autonomously and are able to carry out transactions among themselves independent of human intervention, this will lead to considerable potential for change: A process organization in which intelligent industrial systems handle processes and flows of goods among themselves independently, which coordinates work steps between machines and ensures financial compensation between the systems and devices involved in accordance with their participation in value creation and records all of this correspondingly transparently on a distributed ledger, will ultimately enable an autonomous, self-controlling machine economy.

It is often assumed that it will be difficult to generate a "general artificial intelligence" that also equals humans in its diversity. Most AI systems are trained on very specific problems and are therefore correspondingly limited in their performance on them. However, recourse to DLT as an element of process organization could then provide the basis for a division of labour between several artificial intelligences: If one AI completes its specific work step, it would then be possible to conduct the transfer of the result for further processing with a distributed ledger / smart contract to the next entity. This would ensure that all necessary sub-steps are initiated and processed seamlessly.

This principle - AI taking care of finding decisions, DLT coordinating the resulting actions - could in principle also be mapped in a political DAO. Political issues could be broken down into individual problems (to be handled by the specific AI) by a leading intelligent system - ensuring the handover processes between the AIs among each other but also precisely the "operationalization" of the voters' will and its feeding into the system would be done on the basis of DLT (Wagener 2018).

Undoubtedly, much stricter standards of technical reliability must of course apply to a political system than to the mapping of value chains. And indeed, DAG technology is not yet considered fully mature. Regardless, a corresponding perspective use in societal decision-making raises significant

questions about the guarantee of legitimacy and representation in the political system. The following section shall be devoted to this aspect.

### **3. Legitimacy, Representation and Participation**

The legitimacy deficits, as well as the lack of civic participation opportunities in a largely autonomously acting political DAO, are obvious and already result immanently from its construction: It takes a great deal of trust in technology and technological progress to be able to establish a positive perspective for statehood and representation. Nevertheless, the vision of a "state-DAO" is not merely a product of fantasy. The idea of outsourcing the operative political processes to an autonomously acting entity is indeed met with approval, especially in the USA:

The advantages of such a system are seen first and foremost in the increase in efficiency that can be expected for government decision-making and execution as a result of increased automation. Similar or identical decision-making issues would not have to be renegotiated over and over again, but could be bindingly regulated for the future through a one-time definition. Furthermore, administrative decisions could be made more objective, since the once-established system of rules would be applied equally to all those affected, irrespective of possible personal preferences of the decision-makers "on site". According to this line of argumentation, this would be accompanied by an increase in fairness and equality.

For its supporters, libertarian motives are primarily decisive (Tapscott / Tapscott 2016, 199). DLT is seen as a deliberately technocratic instrument that can be opposed to state and supranational institutions, which would tend to overstep their powers anyway (Tapscott / Tapscott, 2016, 201). Many of these "techno-libertarians" believe that central coordination and the state are products of an outdated patriarchal and hierarchical-authoritarian attitude that must be overcome (Atzori 2015, 24; Sergeenkov 2022; Roberts 2022). Characteristically, market-based modes of operation are transferred to political performance processes. The state as an organization is viewed as a business that must function and deliver if it is to continue to favour its "customers," the citizens. If this does not happen from the point of view of the individual, it is seen as a logical consequence that the latter, in the highest degree of flexibility, will withdraw his loyalty and turn to "alternative offers" (Tarkowski Tempelhof 2012). A free and unbridled market economy is seen as the main guarantor of political stability (de Soto 2014). It is not an option to "force" people into a political system "qua birth," thus depriving them of their freedom "from the very beginning" (Tarkowski Tempelhof 2012). Instead, the principle must be turned on its head and the way paved for the greatest possible self-determination.

The design principles of DLT, which transfer political power directly back to its actual starting point, are identified as the perfect vehicle for this. The mechanization of political systems, which goes hand in hand with this, aims at a deliberate "dehumanization" of politics. Human weaknesses cannot be absorbed by checks & balances alone. On the other hand, the decision transparency created by DLT combined with the executive automatism induced by smart contracts would make corruption and cronyism impossible (Woods, 2015). In principle, it is not that people oppose democracy as such. What is typical, however, is an archaic, and in some cases, extremely simplistic understanding of democracy. Decisions are understood as absolute and divided into black and white, into a binary system of ones and zeros. Majority decisions are thereby always binding, regardless of their content and legitimacy (van de Sande, 2015).

Much of this reasoning is reminiscent of classic social contract models such as Hobbes' Leviathan (Hobbes 1909). According to this view, the state should function more as an efficient machine to

secure the market interests of citizens (König 2020), and civic individuals need not to rely on each other, but only on the functioning of this state system.

Another classic of social theory seems to be at work in the background: Jean Jacques Rousseau's "volonté générale", the "true will of the people," which is consistent with the common good and directed toward what is generally best, can be in opposition to the will of each individual, but also in opposition to the empirically ascertainable will of all ("volonté des tous" ; Rousseau 1762,). It could be argued that the idea of a "volonté générale" would thus be predestined for the use of AI, which, due to its high level of rationality and computing capacity, is capable of depicting even difficult decision-making situations. After all, in times of increasing political complexity and social fragmentation, it is precisely the latter that seems to be pushing classic representative democracies to their limits. AI could make a significant contribution to a more objective determination of "the will of the people".

#### **4 Critical Evaluation**

What the majority of the described argumentation approaches have in common is that they place a high emphasis on the "output" side of the political system and a low emphasis on its "input" side. However, it is precisely the nature of an AI-fed DAO that raises the question of whether decisions are legitimately made. The binary absoluteness of DLT logic decisions is flanked by an unsteady "brain" that, by definition, is autonomously ever-evolving and has to make the decision: While measures based on conventional algorithmic governance achieve their legitimacy from this previously agreed on, "hard-wired" system of rules, AI systems permanently readjust themselves independently based on their learning progress. This may seem legitimate, provided that the goals on the basis of which this occurs are the outgrowth of a (democratic) process oriented toward the purpose of the state. At the same time, the way in which political goals are achieved in a democracy is also relevant. After all, target definitions, on the basis of which a learning system aligns itself, can only ever be of a quantitative nature. However, the effects of such political goal optimization always have a qualitative dimension as well, the scope of which an algorithm can never grasp. For example, it is certainly possible to specify a certain "optimal" budget allocation as a goal for a system, but the question of whether this is then in harmony with a common good, however defined, is a completely different one and cannot be legitimately answered by an AI either in practice or in theory, but inevitably remains the subject of the human domain.

The desired "dehumanization" of political decisions must also be viewed critically against this background. Distortions and social hardships are to be expected, especially if these decisions are no longer made with individual situations in mind. Questions also arise about responsibilities in individual cases - both political and legal.

De facto, algorithms, digital processes and decision-making mechanisms are already no longer purely technical-rational constructs. They also always represent the influence of those involved in their creation, both politically and technically. In this respect, they can be understood as a kind of "amalgam" of people and code. This view reflects the basic principle of the "New Materialism" school of thought. According to this, it would seem increasingly inappropriate to distinguish between humans and non-humans, life and non-living matter, and also between actors and structures. Rather, humans and computer algorithms are blending into "socio-material assemblages" (Kim 2020), creating new capacities for action and resulting modes of action.

The much-cited "Internet of Things" would therefore have to be supplemented by considerations of a "Governance of Things". The human system developers would not dictate the functioning of the

algorithm, the empowerment and necessity of governance would arise from the interaction of algorithm and system developers, explicitly, for example, in the human-induced training with AI data and the resulting autonomous learning development of the system. This process involves ongoing interactions and iterative loops between the two "parties," thus making this "amalgamation" independent.

In view of the importance of algorithms and digital automatisms in our everyday life today, it could be argued that this may already mark the end of the anthropocene and that we are now at the beginning of a "posthuman" age. Accordingly, the social and economic effects are also discussed under the aspect of "singularity", should intelligent systems one day - in a not too distant future - have surpassed human performance and adaptive capacity (Bostrom 2014).

However, as long as this stage does not seem to have been reached, we ourselves have to deal with the human impact on human problems and their potential solutions in our current reality. Politics and social processes, even in times of increasing complexity, are first and foremost the subject of interpersonal negotiations. Therefore, for the sake of democracy, we should face this responsibility in person and not entrenched behind a wall of ones and zeros. So far, the blockchain adepts have failed to provide a clear answer as to how a digitally controlled society regulates conflicts and social insufficiencies beyond market criteria that ultimately propagate nothing other than the law of the strongest. The world is indeed complex, and an appropriate policy must be situationally deliberative and ethically grounded; it requires human and humane participation. In this understanding, the traditional democratic state is more than just a disruptive middleman; it is the sum of its parts, a reflection of society and its citizens.

Technology already plays a role in political decision-making that should not be underestimated. The increase in its importance will be unavoidable and can, of course, also have positive effects. There is no doubt that the line between utopia and dystopia is very narrow at this point. However, it is crucial that people and thus humanity do not lose their main influence on political decision-making, even though we are already seeing a loss of power in favour of technology. Therefore, the following must apply to democratic politics in the digital age:

"Governance by Things" requires good, human and humane "Governance of (these) Things".

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