Beyond the Bureaucracy: Modeling Scenarios of Non-Mediated Governance with Liquid Democracy

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Abstract. Nonmediated Governance (nm-Gov) refers to a visionary state of a society in which members of the society steer their government through Liquid Democracy. This for now purely theoretical concept assumes that every citizen is represented in a digital form, that all assets of the society are represented digitally, as well as that rules that govern the community are digital. This paper summarizes nm-Gov and Liquid Democracy and describes a diagraming technique used to model use-cases to better understand how data in nm-Gov can be translated to concrete governance action. Deeper exploration of nm-Gov through modeling further use-cases with this diagraming technique is the theme of the Beyond Bureaucracy workshop at the dg.o 2025 in Porto Alegre, Brazil.

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1. Introduction

Impulsive administrative behavior has early become the hallmark of the Trump II administration in the USA, causing ripples all around the world. By April 2025 their executive orders regarding themes such as *diversity, inclusion, equity, and inclusion* (DEI) programs (EO 14151, 14173, 14190, etc.), birthright citizenship (EO 14160), foreign aid programs (EO 14169), public administration workforce (EO 14210, 14238), or tariffs (EO 14245, 14257, 14259, 14266), have substantially affected the legal, economic, and social fates of many US-American inhabitants, citizens, and voters. The swiftness and character of the actions brings up two important aspects of modern democracies: the aspect of buyer's remorse in relation to a continued democratic support of a government administration by its voters (Curtice, 2018; Krieger, 2025), as well as the question of the ability of traditional institutions of democracies to enforce the *rule of law* where governments result to *nonacquiescence* (Matthew, 2019). An indication for an ongoing conflict between the branches of government in the USA is the outcry by popular media outlets on the legal challenges faced by the Trump II administration regarding their executive orders. But other Western nations are also facing similar conflicts. Thus, the *International Criminal Court's* (ICC) issuance of an arrest warrant against the prime minister of Israel and his minister of defense put ICC member states in a position where defiance of the ICC was considered openly (Diekjobst, 2025; Sabel, 2024).

More direct democracy has been argued as a remedy against newly elected governments getting off the democratic leash (Kogan, 2016). A special kind of direct democracy is *Liquid Democracy* (Paulin, 2014, 2020; Valsangiacomo, 2021), a way of democratic representation in which individuals revocably delegate their political *trust* to other members of a community and vote on matters of common concern by the power of their received delegated *trust*. Liquid Democracy (LD) considers also delegated trust as a form of semi-active political participation and thus, it can maximize the number of members of a society that back political decisions. As such, LD is considered the most democratic way for a community to arrive at common decisions (Blum & Zuber, 2016; Valsangiacomo, 2025). The

defining characteristic of LD is the ability of an individual to revoke their trust delegation at any time (hence "liquid"). This characteristic can serve as a mechanism for a community to implement policies that can *erode* and eventually *vanish* once the community is no longer backing them by a sufficiently high intensity of support.

The practicability of LD remains a subject of active debate amongst scholars (Butterworth & Booth, 2023; Caragiannis & Micha, 2019; Valsangiacomo, 2025; Valsangiacomo & Zuber, 2025). Scholars who argue in favor point out at the superior democratic properties of this model, while scholars who argue against it bring forward fears of utter chaos stemming from a high frequency in changes to laws, citizens overburdened with too much choice, and a lack of institutional checks and balances if LD was to be used as a tool for passing laws and public policies. One way or another, LD remains a concept with different possible implementations with not enough empirical observations from real-world experiments (Paulin, 2019a, Section 3.5-"Apropos: the Pirates & co.", 2020).

Liquid Democracy can only be implemented by digital systems that rely on *informated* (Paulin, 2018) relations between members of a community; *informated* means that the identities of individuals are described as digital data that resides in cyberspace. One way of implementing LD has been described by Paulin (2014, 2019e): to apply it in such a way that the action of agents and agencies, which collectively make up government, can be steered by controlling access to informated resources such as public funds (use of money for concrete undertakings), societal ranks and roles (who can call themselves "head of state" in relation to other nations, who has the trust to adjudicate conflicts, etc.), and the eligibilities that come with such ranks or roles in a society (who has access to state secrets, to the nation's bullion vault, to weapons systems, etc.). Such use of LD for *steering* the agents and agencies of a state is quite different from using LD for gathering a public's opinion on a policy issue that would merely *instruct* agencies to behave in a certain way. This approach is called *Nonmediated Governance* and examples on how this could work out are provided in chapter 10 of the book *Smart City Governance* (Paulin, 2019d).

The objective of this paper is twofold: (1) to outline *Nonmediated Governance* (nm-Gov) as a visionary concept, and (2) to describe a toolset to plan and model scenarios for nm-Gov. The rest of this paper is structured as follows: Section 2 presents nm-Gov in terms of a vision. Section 3 presents nm-Gov scenarios to illustrate the concept and a toolset for modeling nm-Gov scenarios that shall be used to further explore nm-Gov scenarios as part of the Beyond Bureaucracy workshop at the dg.o 2025.

2. Nonmediated Governance

The term *Nonmediated Governance* – nm-Gov (Paulin, 2019d), refers to a visionary state of a society in which members of the society steer their government through Liquid Democracy – LD. In nm-Gov, LD is not used as a tool to form public policy, but as a tool to *steer* (by assigning / revoking) societal roles of individuals, budgets of projects, and access to *resources* such as information, data, or systems. This concept is *visionary*, as it can be imagined only as a hypothetical state and has not been directly implemented in modern states. To implement it, a society / state would need to assure that all citizens' identities, as well as *resources* of such society were represented in form of digital data that can be accessible from within cyberspace.

As of today, such interaction between *identities* and *resources* in cyberspace already exists: e-mail providers, e-banking systems, cloud storage, as well as cyber-physical systems (systems that can be steered from within cyberspace as part of the *Internet of Things* paradigm (Kopetz & Steiner, 2022)) are nothing but systems that provide *informated* resources of some kind, and govern who can access these resources under what conditions (cf. van Steen & Tanenbaum, 2023). Representing individuals and their properties in cyberspace is easily doable by state-of-art technology, and so is representing resources such as money, information, or systems. Controlling access to such *informated* identities, properties, and resources can easily be done (Paulin, 2019b) and is well established in online services and "smart" products that are connected to the Internet for purposes of control and maintenance, such as cars, farming machinery, household appliances, drones, etc.

Modern states however did not do the leap into cyberspace in a way that would leverage this potential just yet. The focus of states is on e-government, which is about *digitalizing* processes that have been designed and implemented before the digital age (Bovens & Zouridis, 2002; Paulin, 2019b, 2019a). The outcome of (digitalized at best) government processes are typically certificates of some kind – birth certificates, marriage certificates, high school and university diplomas, building permits, etc. Some government bodies issue and accept *informated* certificates (Austria, for example provides the app "eAusweise", which provides one's driving license, car registration certificate, and personal ID in form of a dynamically generated QR code), but they remain *certificates* even so. The objective of such certificate is to manifest that its holder has a given set of characteristics (e.g. has graduated high school, is married, or has been deemed fit to operate a vehicle). These characteristics can have a meaning under specific circumstances: some jobs might require a university diploma, alimony and inheritance rights will depend on whether one has been married, and authorities might punish one for starting construction without a building permit.

In contrast, whenever we check e-mails, transact money via e-banking, or access cloud files, we do not present certificates that would demonstrate our *eligibilities* within these digital systems. Obviously, it would be counterintuitive to do so, but one might still ask: why not? The reason is, that digital systems have built-in mechanisms that govern the access to resources based on the *identity* of the accessor. These *resources* are *objects* such as folders, files (also e-mails are files!), records (e.g. bank transactions), and user accounts, as well as *properties* of these objects, which define their characteristics. Even the rules by which access to the *resources* of a digital system is governed, are *resources* of the digital system, and hence, can be inspected and modified if one has the required *eligibilities* to do so.

Resources in a digital system are nothing but digital *data* that can be created, read, modified, and deleted. Changes to this data can change the way a system behaves and can change who can access what resources under which conditions. This paradigm could be – in theory at least, applied to govern entire states. This would require each citizen's identity to be represented as digital data within a system, as well as all resources of the state, such as funds, information, or access to technical systems that can be controlled from within cyberspace. Such system could be either a monolithic program, or a distributed system consisting of many connected systems as is the World Wide Web (Berners-Lee et al., 1992). By accessing the data stored in such system one could *determine* at any time the role, the rank, and the *eligibilities* of a person in a given context. By modifying this data, one would shape one's own or other people's role / rank / eligibilities.

If also the rules governing access to this data would be stored in the same way as other data in that system, then an interesting possibility would arise: a society could change these rules by means of LD, thus organically morphing the rules under which the society operates. The rules by which the liquid democratic decision making would operate in such society – i.e., what is needed for a decision to be binding, can be represented in this way as well. Such self-altering system is technically possible, as has been demonstrated by Paulin (2015, 2019c), who used relational databases and the SQL language to show how such digital rules can be accessed and changed by means of Liquid Democracy.

3. Modeling rules for nm-Gov: Constellation-Based Reasoning

In nm-Gov, *eligibilities* are derived ad-hoc from data know to the system without human mediation in creating, accessing or manipulating this data. Parts of this data would be *assertions* by officials and professionals on conditions such as one's knowledge level on a certain matter, physical health, or judgments in criminal or civil proceedings. Other data would be provided during vital events (birth, marriage, death), education, employment, etc. By interacting with this data, one might be able to conduct things like:

- Registering the birth of another person. *Conditions*: 1) one is registered as a professional with a role that allows for a creation of such data; 2) the person to be registered has not yet been registered already.
- Give one's newborn a name. *Conditions*: 1) one is a parent of the newborn; 2) the person to be given a name has no name yet.
- Authorize a payment to a company to build a new park in the city. *Conditions:* 1) one has the backing of the required number of community members in the LD network; 2) there is enough money on the community's account.
- Impose tariffs by implementing a rule according to which if one wants to pay money to a company that is on a long list of foreign companies, they first must have paid 25% of that sum to the community. *Conditions:* 1) one has the backing of the required number of community members in the LD network to change the rules.
- Claim one's monthly salary. *Conditions:* 1) one is on a list of people entitled to a salary.
- Remove somebody from the list of people entitled to a salary. *Conditions:* 1) one is on a list of people entitled to change data in the list of people entitled to a salary.
- Claim one's monthly payment of unemployment allowance. *Conditions*: 1) one is not making active contributions to the unemployment insurance; 2) one has been paying unemployment insurance contributions for six months before claiming the allowance; 3) one has not been claiming unemployment allowance for six months already.

Above conditions can be thought differently and for sure would differ by jurisdiction and time. They serve to illustrate the relation between one's intended action and conditions that need to be fulfilled so one has the *eligibility* to conduct the desired action. One's eligibility derives from a *constellation* of data know to the nm-Gov system – data such as whether one exists, is on the payroll of some public agency, has been contributing to unemployment insurance, has the backing of a community to change its rules, etc.

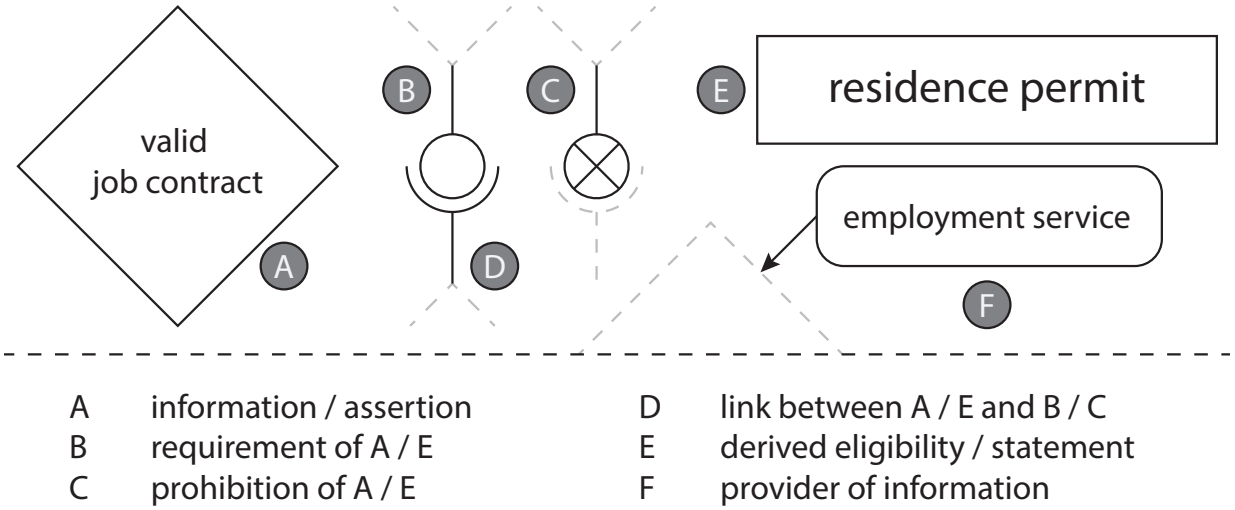

Fig. 1 - Elements for depicting constellation-based-reasoning (CBR) by means of a diagram.

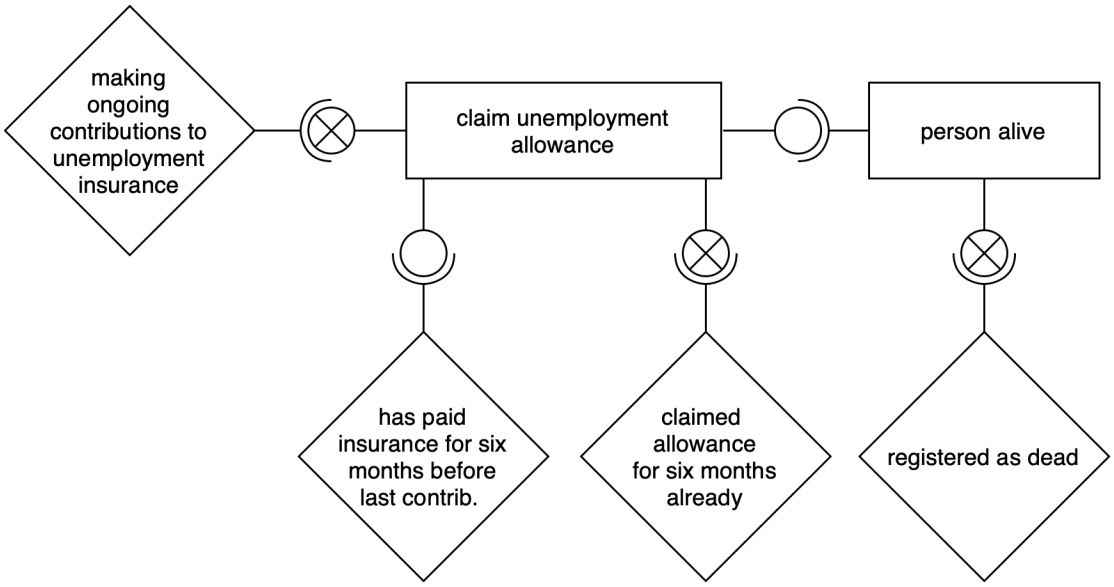

Fig. 2 - CBR diagram depicting the constellation of data required so that one can obtain their monthly unemployment allowance payment

To model and communicate such constellations of preconditions visually, a diagramming technique has been devised (Paulin, 2019d, Section 9.3), as shown in Fig. 1.: Element *A* is used to express data known to the nm-Gov registry; element *E* stands for the eligibility one desires; *B*, [C], and [D] are connectors, whereby [B] indicates that the assertion from the connected [A]-element must be existing and / or true, while [C] indicates that the data / assertion from the connected [A]-element must either not exist, or not be true. Element [F] is used to indicate who can provide the data / assertion. An implementation of this toolset for Draw.io is available on GitHub (Paulin, 2025).

Fig. 2 shows how the CBR diagram can be used to model a claim for monthly unemployment allowance payments.

Further use-cases of nm-Gov reasoning were modelled by this technique as part of the Beyond Bureaucracy workshop at the dg.o 2025. The first part of the workshop aimed at creating a deeper understanding of nm-Gov and LD. The diagramming technique as described here was introduced to the participants using the Draw.io implementation. Finally, workshop participants selected complex scenarios to be modelled and discussed with regards to their real-world implications.

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References

Berners-Lee, T., Cailliau, R., Groff, J.-F., & Pollermann, B. (1992). World-Wide Web: The Information Universe. *Internet Research*, *2*(1), 52–58. https://doi.org/10.1108/eb047254

Blum, C., & Zuber, C. I. (2016). Liquid Democracy: Potentials, Problems, and Perspectives: Liquid Democracy. *Journal of Political Philosophy*, *24*(2), 162–182. https://doi.org/10.1111/jopp.12065

Bovens, M., & Zouridis, S. (2002). From Street-Level to System-Level Bureaucracies: How Information and Communication Technology is Transforming Administrative Discretion and Constitutional Control. *Public Administration Review*, *62*(2), 174–184. https://doi.org/10.1111/0033-3352.00168

Butterworth, G., & Booth, R. (2023). A Contribution to the Defense of Liquid Democracy. *Proceedings of the 24th Annual International Conference on Digital Government Research*, 244–250. https://doi.org/10.1145/3598469.3598496

Caragiannis, I., & Micha, E. (2019). A Contribution to the Critique of Liquid Democracy. *Proceedings of the 28th International Joint Conference on Artificial Intelligence*. IJCAI-19.

Curtice, J. (2018). Buyer's Remorse: Has Britain Changed Its Mind on Brexit? *Political Insight*, *9*(1), 12–15. https://doi.org/10.1177/2041905818764700

Diekjobst, R. (2025). Editorial #43: The Ides of March. *Völkerrechtsblog*. https://doi.org/10.17176/20250313-000814-0

Kogan, V. (2016). When Voters Pull the Trigger: Can Direct Democracy Restrain Legislative Excesses? *Legislative Studies Quarterly*, *41*(2), 297–325. https://doi.org/10.1111/lsq.12115

Kopetz, H., & Steiner, W. (2022). Internet of Things. In H. Kopetz & W. Steiner, *Real-Time Systems* (pp. 325–341). Springer International Publishing. https://doi.org/10.1007/978-3-031-11992-7_13

Krieger, N. (2025). Buyer's Remorse, Betrayal, and Blame: Who Will Be Held Responsible for the Adverse Health Impacts of the US Elections? *American Journal of Public Health*, *115*(3), 324–325. https://doi.org/10.2105/AJPH.2024.307985

Matthew, T. W. (2019). *Ignoring the Courts: A Contextual Analysis of Administrative Nonacquiescence*. https://doi.org/10.15779/Z387W6762V

Paulin, A. (2014). Through Liquid Democracy to Sustainable Non-Bureaucratic Government—Harnessing the Power of ICTs for a novel form of Digital Government. *eJournal of eDemocracy and Open Government*, *6*(2), 216–230. https://doi.org/10.29379/jedem.v6i2.307

Paulin, A. (2015). *Towards a sustainable system for non-bureaucratic government: Doctor of science thesis* [Doctoral thesis, University of Maribor]. https://dk.um.si/IzpisGradiva.php?id=47605

Paulin, A. (2018). Digitalisation vs. Informatisation: Different Approaches to Governance Transformation. *Central and Eastern European eDem and eGov Days*, *331*, 251–261. https://doi.org/10.24989/ocg.v331.21

Paulin, A. (2019a). Controlling Citizens or Controlling the State? In *Smart City Governance* (pp. 61–79). Elsevier. https://doi.org/10.1016/B978-0-12-816224-8.00003-0

Paulin, A. (2019b). Controlling Through Technology. In *Smart City Governance* (pp. 143–158). Elsevier. https://doi.org/10.1016/B978-0-12-816224-8.00007-8

Paulin, A. (2019c). Describing Legal Rules Through a System of Electronic Legal Acts. In *Smart City Governance* (pp. 237–250). Elsevier. https://doi.org/10.1016/B978-0-12-816224-8.00013-3

Paulin, A. (2019d). Model for Nonmediated Governance. In *Smart City Governance* (pp. 187–201). Elsevier. https://doi.org/10.1016/B978-0-12-816224-8.00010-8

Paulin, A. (2019e). *Smart City Governance*. Elsevier. https://doi.org/10.1016/C2017-0-04241-6

Paulin, A. (2020). An Overview of Ten Years of Liquid Democracy Research. *The 21st Annual International Conference on Digital Government Research*, 116–121. https://doi.org/10.1145/3396956.3396963

Paulin, A. (2025). *CBR shapes for Draw.io* [Dataset]. https://github.com/aloispaulin/nmgov/blob/main/CBR%20Elements.xml.

Sabel, R. (2024). Israel, the ICC, and the Arrest Warrants against Netanyahu and Gallant. *Israel Journal of Foreign Affairs*, *18*(3), 320–325. https://doi.org/10.1080/23739770.2024.2440838

Valsangiacomo, C. (2021). Clarifying and Defining the Concept of Liquid Democracy. *Swiss Political Science Review*, spsr.12486. https://doi.org/10.1111/spsr.12486

Valsangiacomo, C. (2025). Six arguments in favor of liquid assemblies. *Critical Review of International Social and Political Philosophy*, 1–24. https://doi.org/10.1080/13698230.2025.2478729

Valsangiacomo, C., & Zuber, I. (2025). *Should a citizens' assembly complement the European Parliament?*. Publications Office. https://data.europa.eu/doi/10.2870/9250462

van Steen, M., & Tanenbaum, A. S. (2023). *Distributed Systems* (4th ed.). distributed-systems.net.