

# Automation, Legislative Production and Modernization of the Legislative Machine: The New Frontiers of Artificial Intelligence Applied to Law and e-Democracy

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**Abstract.** Electronic democracy is still far from being realized and several issues must be solved in order to make it possible. The quantitative problem of popular participation is one of them, but it can be mitigated through automation. This Chapter proposes two main applications that may help building a multilevel digital *agora* where *demos*, lawmakers, governments, and public administration may cooperate. The first is related to the integration, in each platform used for this purpose, of specific decision support systems. The second is inherent in the use of IT tools that, integrated into a digital *agora*, allow to transform the multiplicity of individual contributions into a general will.

**Keywords.** e-democracy, lawmaking, artificial intelligence, digital agora

## 1. Introduction

‘Electronic democracy’ (or e-democracy or digital democracy) may be studied from various viewpoints: law, sociology, computer science, philosophy, etc. However, there is no unambiguous notion of e-democracy; moreover, sometimes technology is seen as harmful for democracy and other times as a panacea for its problems. Thus, we can look at e-democracy ranging from exciting utopias to frightening dystopias, but both extremes are misleading. It is more useful to study e-democracy without forgetting that its core is ‘democracy’, not ‘electronic’. Thus, a previous in-depth analysis of its foundations as a democracy is needed to build upon a theoretical model of e-democracy. On the basis of such brief and preliminary observation, it may appear clear the perspective from which e-democracy is seen here, taking into account a model in which the technological component is secondary to the theoretical and conceptual ones.

Hence it could be defined as a new form of representative democracy in which tools of direct, deliberative, and participatory democracy are institutionalized; they can allow the exercise of popular sovereignty with advisory and legislative powers as appropriated.

Sovereignty is exercised in a digital *agora* (i.e. an electronic platform composed of a networked and multi-level system of smaller digital *agora*). This platform must be equipped with tools that simplify both the interaction of the *demos* and the various processes that are carried out, with the use of automatic data processing tools and support to the various stakeholders involved. Moreover, such platform may be designed in compliance with principles, values, and rules of each State in which it is implemented [1]. Several benefits could be achieved; for example, reducing the gap between politicians and the *demos*, empowering the latter.

This notion may be considered as a weak notion of e-democracy, because technology must adapt to each legal system, and not vice versa.

It is not possible to go deeper into the above-mentioned profiles, but it is clear that even such weak notion of e-democracy is still far from being realized notwithstanding the diffusion of new technologies and ‘the rise of the Network Society’, [2] in which digitalization is pervasive.

This is true even considering that technology plays a very important role in today’s politics. On the one hand, the political debate is often carried out using electronic means: politicians and people discuss on social networks; political information is widely available; etc. On the other hand (and generally speaking), political and legislative procedures are still linked to the past. It means that some potential and important benefits of technology are not taken advantage of.

However, several issues must be solved in order to make e-democracy possible<sup>1</sup>. Even if it is not possible to investigate them in this Chapter, it is obvious that the quantitative problem of popular participation is one of them and it can be argued that it can be mitigated (although not solved) through automation. Automated acquisition and processing of information is an essential component for e-democracy: not only it can help overcoming the just mentioned issue, but it can also assist lawmakers in carrying out their task.

In fact, it is well known that, since the 1970s, the creation, diffusion, and technological development of computers and databases have allowed increasingly precise and refined processing of personal data exceeding the limitations inherent to those carried out with non-automatic tools. Similarly, the development and the use of advanced systems for processing particular types of information may enable the *demos* to be informed and effectively participate in the political life of the State, on the one hand, and lawmakers to fulfill their institutional tasks more efficiently, on the other hand. In other words, the legislative machine, regardless of its composition, can benefit from the automation of certain activities through the development and use of particularly advanced and ‘smart’ IT tools.

This Chapter proposes two main applications that may help building a multilevel digital *agora* where *demos*, lawmakers, governments, and public administration may cooperate.

The first is related to the integration, in each platform used for this purpose, of specific decision support systems, made up of a database of legal texts (laws and judgments) and of an expert system that allows people to understand the information stored in the database.

The second is inherent in the use of IT tools that, integrated into a digital *agora*, allow to transform the multiplicity of individual contributions into a general will.

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<sup>1</sup>See *infra*, Section 2.

## 2. Some Issues of e-Democracy

It seems useful to briefly outline some issues of e-democracy before analyzing the problems and the possible solutions above mentioned because all these issues are connected; they are related to theory, design, and the *demos*.

The first issue concerns the weak theoretical framework of digital democracy, because in the past years the debate was focused on applications without taking into sufficient account the problem of its foundation<sup>2</sup>.

As Janus Twofaced, the second major issue has two opposite profiles: as IT tools are not designed for e-democracy (but mainly for private uses), democracy is not designed for IT tools (and its fundamental legal texts have usually been written in a distant past, from a technological perspective). It is a matter of fact that political communities and discussions over the Web (and the social network) are often characterized by verbal fights (more than political debates), thus such processes may be more disruptive than aggregative; therefore, they are able to undermine the formation and realization of a general will, as in a dystopian model of electronic democracy. Digital democracy should instead be based on a custom-built platform technology whose functional and technical specification are set by each State in compliance with its rules.

The third issue regards the role of the *demos* in current democracies, that is especially delicate in a period in which the rise of populism could even suggest limiting such role. Broadly speaking, should be recommended that the *demos* participate in the legislative process? Yes: on the one hand, it could finally exercise its sovereignty in a continuous and not intermittent way; on the other hand, it could be held responsible because its choices would be much more effective and tangible than expressing dissent on social networks and electing its representatives (who can be blamed for their actions). The *demos* could become a real stakeholder in the political field and be responsible for its choices: it is easier to blame its representatives than itself.

However, the *demos* should be able to act and thus it is necessary to build a multi-level digital *agora*<sup>3</sup>. It may be designed as a permanent and highly organized computer assembly in which IT tools allow a continuous (and sometimes automated) interaction. Nonetheless, individual interactions should be processed to reduce complexity and recognize the general will, thus solving the quantitative problem of popular participation. This could also help in achieving a general and reciprocal listening, because the connection between speaking and listening is particularly weak on the Internet [6]; [7] and this may endanger e-democracy. Moreover, these tools should be controlled with no bias by public powers and with full transparency to avoid giving control of public infrastructures to private entities who could become the gatekeepers also of political procedures: today Google, Facebook, and few other entities already are the gatekeepers of political (and many other) information. For example, a search engine can decide what can be accessed

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<sup>2</sup>Relatively few studies in the fields of legal philosophy, legal theory, political philosophy and political theory took into account digital democracy; however, this scenario is changing, and several contributions give life to an interesting debate. Among others, see: [1]; [3]; [4]; [5].

<sup>3</sup>The digital *agora* should not be unique: a network of *agora* should be provided to achieve effective multi-level governance and fully implement the principle of subsidiarity. Moreover, such reticular system is well suited to the traditional representative organs with a view to interparliamentary cooperation. The IT platform could be used to create *agora* between different States (for example, in the European Union). Each *agora* can adopt its own rules, but they could communicate using standard protocols and formats (as in the case of the World Wide Web, in which the most different devices are able to communicate regularly).

on the Web; it can hide and/or rank information making it hardly be found: “By controlling the communication infrastructure of the Internet, they have become information gatekeepers”<sup>4</sup> [8].

### 3. Artificial Intelligence, Law, and e-Democracy

Before analyzing the proposed decision support systems and the IT tools tailored for the digital *agora*, it is necessary to dwell on issues related, in general, to artificial intelligence applied to law and, more specifically, on how it could be used in the field of e-democracy; then risks and benefits will be analyzed in the perspective of the aforementioned disciplines.

First of all, the application of artificial intelligence to law is one of the most traditional and stimulating fields of investigation of legal informatics, but also one of the more difficult.

So far, the dream, or nightmare, of an electronic judge was not realized as it was feared in the Sixties<sup>5</sup>, but there is no doubt that considerable progress has been made towards technologies that allow execution of tasks that require ‘intelligence’ and that, in a more or less distant future, will make possible this and other objectives that today seem unattainable (raising the question about the opportunity of using similar means).

However, the law still is an extremely difficult area for information technology. In the recent past, the problem of semantic understanding has been connected to the fact that a computer cannot understand what has not been algorithmically formulated. Obviously, not all the laws can be translated into algorithms; moreover, the formalization of the law – and therefore a strictly literal interpretation – cannot be taken to the extreme. In fact, to achieve a rational thought, rules must be followed; in principle, they are incompatible with those unhappy, contradictory and incomprehensible expressions contained in many legal texts. This, on closer inspection, applies to the language *tout court*, which is often vague, indeterminate, and equivocal.

Despite such difficulties, IT studies are making considerable progress and increasingly sophisticated algorithms are being developed; natural language is gradually better understood by automated machines and tools. After all, even voice assistants are a ‘common technology’<sup>6</sup>.

In particular, the ability to manage increasingly complex and numerous information, as well as to direct one’s conduct on their basis (and on the modifications of the digital and material environment), is a realization of cybernetics (and therefore of the interdisciplinary theories of Norbert Wiener [10]), on the one hand, and of the three areas of investigation of jurimetrics outlined in the Sixties, on the other hand. More specifically,

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<sup>4</sup>Moreover, “Users have become dependent on search engines, viewing them as authoritative and reliable. Search engines have become the tools through which the democratic potential of the Internet can be advanced or hindered” [8] p. 145.

<sup>5</sup>However, see [9]: the Authors have built a model designed to predict the behavior of the Supreme Court of the United States in a generalized, out-of-sample context. They developed a time evolving random forest classifier which leveraged some unique feature engineering to predict more than 240,000 justice votes and 28,000 cases outcomes over nearly two centuries (1816-2015). The authors used only data available prior to decision and, over nearly two centuries, they achieved 70.2% accuracy at the case outcome level and 71.9% at the justice vote level.

<sup>6</sup>Just think at Amazon Alexa, Apple Siri, and Google Assistant.

these areas are related to the archiving and electronic retrieval of legal information, the forecasting of future judgments of the judicial authority through the analysis of rulings and, finally, to the application of logical criteria to legal issues to logically control the reasoning that led to the judicial decision.

In the following decades the desired results were not achieved; technologies were not advanced enough, and judges had to evaluate not only previous rulings but also the evolution of the society (and such evaluations may lead to different interpretations).

The same happened with the studies on artificial intelligence, which have received maybe too criticism without recalling some of their indisputable achievements in the understanding of intelligence, in the development of new formal tools and new computer architectures; yet, IT development has led, at the beginning of the 21<sup>st</sup> century, to a progressive diffusion of hardware and software tools based on more or less refined techniques and applications of artificial intelligence.

We can draw important lessons at a theoretical level from these early theoretical and practical experiences, especially if we make reference to studies on legal philosophy and theory.

First of all, we can obtain the necessary theoretical bases for a potential e-democracy platform by updating the three areas of investigation of jurimetrics [11].

Today the information field is much more evolved; this is crucial because it allows any person (despite being a citizen) to acquire knowledge of both the regulatory framework and the relevant factual data, while being able to use automated filters.

The logical-decisional field can be understood in the sense of a system of decision support, not being able to replace the human one, as will be argued below.

Finally, the forecast field is necessary for a possible *ex post* evaluation of a potential decision, even if this tool is particularly sensitive because it may be abused and therefore should be limited only to positive law (with only reference to the regulatory impact).

#### 4. Building a Digital Agora: Decision Support Systems and (New) IT Tools

A digital *agora* requires tools to acquire and make available information to the *demos*, on the one hand, and to let it take decisions. The former will feed a database, while the latter will provide means to express *demos*' opinion and organize the multiplicity of different manifestations of people's will, thus overcoming the quantitative problem of popular participation.

Particularly, the digital *agora* (and all of its nodes) should include specific decision support systems, made up (at least) of a database of legal texts (laws and judgements) and of an expert system that allows people to understand the information stored in the database. The aforementioned systems should be usable by citizens (or legitimate users) in order to enable them to fully and consciously participate in a digital *agora* thanks to the possibility of forming their opinion on a particular subject or case with the intermediation of a subject whose automated impartiality is guaranteed and verifiable.

The databases should be arranged as a network, like the Internet and the Web. They must be interoperable, so that they can: (i) connect to each other; (ii) be accessed by each digital agora; (iii) be consulted by each citizen or by any legitimate user<sup>7</sup>.

<sup>7</sup>The limits of digital citizenship may be less strict than the ones of traditional citizenship.

Although these databases should be public<sup>8</sup>, the progress made in the provision of these services by private entities can be particularly useful to drive evolution of public ones in data collection, record, organization, and processing, on the one hand, and being queried and presenting results, on the other hand. After all, everybody knows that in the Information Society there is a multitude of databases: not by chance, the most precious resource is today the information itself. Even when they contain billions of data, they can be extremely efficient and be accessed in response to billions of users' queries using several devices (smartphones, tablets, computers, cars, etc.).

However, information retrieval systems may have bugs or be not efficient, for example partially or totally hiding certain information, or be wrong in ranking results of users' queries<sup>9</sup>.

Notwithstanding some bugs (and the potentially critical impact for those who are damaged by them), these platforms are increasingly efficient and precise, but they are provided by private entities executing secret algorithms and computer codes, so that they can be studied only on the basis of their outputs.

Even if these obstacles can be overcome in providing a digital *agora*, a cooperation between public and private sectors could be very useful. In fact, the public sphere is characterized by many databases managed by public administrations that progressively, albeit slowly, become interoperable<sup>10</sup>, but archiving and retrieval of information can be long and complex activities; moreover, there is the problem of understanding texts and retrieved data, which is accompanied by their uselessness for practical purposes unless the individual is not one of the stakeholders of a given process (legislative, regulatory, judicial, etc.) and therefore has a concrete interest. Without a guide to make the ever-increasing amount of information available online, how can we hope that, even in the hypothesis in which the *demos* is called to participate actively, is it really able to do so?

Since it is important to make the *demos* both able to access and to understand information in order to actively participate in the public sphere, information technology can strongly contribute by elaborating complex information and making it relatively simple.

Thus, databases of several types should be used and include not only the legal ones. In fact, the amount of information already memorized by each State could be complemented by those freely available on the Net and managed by private parties. The joint analysis of this huge amount of information can be an essential resource for electronic democracy, also through automated analysis using Big Data and machine learning technologies that must be carried out in compliance with the fundamental principles of each democracy.

In fact, while the process of dematerialization of legal sources – which is often accompanied by the provision of free access to it – is growing, it is not enough. It would be necessary to provide advanced databases in which specific expert systems process information about a particular sector and make it usable for the *demos* who has to exercise its sovereignty in the digital *agora*.

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<sup>8</sup>Generally speaking, a recent report on how UK media cover AI reveals that a majority of articles are pegged to industry concerns, and a plurality of sources originate from industry. The role of public action in addressing AI is usually undermined, while coverage frequently amplifies self-interested assertions of AI's value and potential and positioning AI primarily as a private commercial concern [12].

<sup>9</sup>Web search engines are an emblematic example of what has just been argued; see [13].

<sup>10</sup>See, among others, [14]. In particular, the Authors make a distinction between technological data, human, and institutional interoperability (p. 5-7).

Therefore, the contribution of legal informatics is fundamental, since the legal databases can be profitably organized thanks to the studies carried out on this subject for several decades and this organization can be a guide for a better implementation of the automatic systems for the understanding of law. More generally, the aforementioned databases could certainly be useful also for traditional lawmakers.

In other words, the information system must be designed taking into account not only mere indexation aimed at retrieving data, both legal and not, but also selection by association. Under this regard, it may be useful to actualize a pioneering thesis of Luigi Lombardi Vallauri by correlating the democratic nature of legal information with the democratic nature of the legal system, since there can be no political obligation if the content of the obligation cannot be known, or it is too difficult to be known [15]. The contribution of legal informatics is needed to create a system of legal information oriented to the citizen who not only offers him or her the 'simple' legal documentation but also facilitates his or her understanding ('translating it') and also provides him or her with links to set up or even to solve a specific legal problem.

This thesis is very suggestive and its application to the field of e-democracy is very useful, especially if we argue that knowledge of law is not equivalent to knowledge of legal information, for which mediation cannot be overcome [16]. We can therefore look at the thesis of Lombardi Vallauri both taking into account this point and claiming the possibility of achieving the creation of a 'legal automaton' capable of providing an opinion: this would provide both the elements necessary for the democratic nature of legal information, i.e. documentation and opinion. If, however, this does not yet seem feasible (and maybe undesirable for someone), it can be said that such a system can be better adapted to the field of electronic democracy than to democracy *tout court*, because a network of databases in which several software agents act would be supported by human action for several sectors (law, economics, etc.). Thus, it would be possible to set up a truly usable system for each citizen or individual qualified to interact in the digital *agora*.

Therefore, alongside a system that makes specialist information available and that 'translates' it into understandable terms, as far as possible, it is necessary to put an expert system. These tasks can be performed by automated software which, on the one hand, builds and feeds each database, then performs the necessary processing, and, on the other hand, assists each individual who queries it.

These tools can be evolved to aid achieving the democratic ideal.

This system should be accompanied by a second set of IT tools that, integrated into a digital *agora*, should be aimed at allowing to transform the multiplicity of individual contributions into a general will; this may happen through a gradual reduction of the number of such interactions thanks to automated means. Moreover, using the same technologies used for the first application, it is possible to simulate, in advance, the effects of one or more decisions (just think of the participatory budget, in which each decision can influence the others).

In detail, in each digital *agora* it is possible to assume several phases of discussion that must end within a specified time. At the end, the will of the participants is 'interpreted' using sentiment analysis techniques to synthesize them and reduce the field of discussion before voting. In this way it is possible to go beyond the limits of the binary logic of voting and reach a compromise between the discussion by a multiplicity

of subjects and the need to reach the decision-making phase: both are necessary in any democratic process. This perspective, therefore, is based on the paradigm of automation.

However, in the perspective of digital democracy, what logic should be followed by the digital *agora* platform and what relationship should it have with truth? An e-democracy platform cannot ascertain the truth of the premises used in each reasoning, even if they can allow a reasonable degree of truth in relation to specific types of data where automated tools are provided (if a cross check is made possible). In other words, data entered into the system or acquired by its own software agents will constitute the premises of each machine reasoning, but its correctness should be evaluated upstream of the computer system (for example, with regard to the correct insertion of legal texts or to the number of citizens officially residing in a municipality). Thus, some databases must be characterized by absolute transparency and be constantly and fully available online, as often happens in many countries concerning the legislative texts and the work of the parliaments. In others it will be necessary to continue to reconcile the need for transparency with the right to privacy of any subjects involved or at least other interests actually involved.

Moreover, this electronic platform must be continuously nourished by new knowledge that is not exclusively juridical; however, today even a hyperintelligent automaton could not have that vast sphere of experience which only a human being possesses, and which is constantly growing (but, as the Information Society grows stronger, this gap reduces)<sup>11</sup>.

## 5. Conclusions

It can be concluded that a decision-making system in the legal field that is completely autonomous could not be satisfactory, even if fed by knowledge deriving from studies and research as well as from machine learning. As e-democracy can be an important support to complement traditional democracy, so automation in the legal field can be a precious help and probably irreplaceable in the future for the various legal operators.

Furthermore, the whole legislative machine can benefit from the benefits of automation through the development of software that can assist the various parties involved in the whole process. The *demos* and the traditional lawmakers could benefit from tools that allow them to understand the factual situation, the current legislative framework, and the potential framework for the outcome of the new rules to be discussed or the administrative decisions to be taken. The legal operator can obtain an advanced support that helps her or him to orient himself in the multiplicity of regulations in force (at several levels), but, in any case, subject to his professional and particularly qualified judgment. More generally, both the governments and the *demos* could benefit from observing the reality also by making reference to Big Data, provided that certain criteria are respected: transparency, neutrality and objectivity (if and where possible, and taking pluralism into account).

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<sup>11</sup>The applications discussed in this paragraph should be designed by experts of legal informatics, in cooperation with computer scientists, and with the fundamental contribution of experts of legal philosophy, legal theory, and constitutional law. This is due to the fact that its framework must be built taking into account a specific legal system.



However, both philosophical and positive law problems arise, also with reference to e-democracy. In fact, automation is the key to overcoming quantitative issues that make impossible to realize today a democracy like the Athenian democracy one, and which entail the excessive burden of certain proposals aimed at involving the population (such as deliberative polls). But it can also be used to control and manipulate the *demos*. It is therefore necessary to look towards a *constitutionally oriented* automation: it should be always respectful of the fundamental principles generally recognized in constitutional democracies. Nevertheless, it is not an easy task due to many factors, including the secrecy surrounding computer codes and algorithms, as well as the partial predominance of (private) technological powers over others, including public ones.

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