

CHAPTER V.

Evolution in the Usage of AI in Parliaments

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Introduction

Artificial intelligence is transforming our societies and everyday life, and its influence is rapidly extending to government institutions, including parliaments. Since most discussions have focused on the role of AI in administrative and judicial decision-making, its use in parliaments remains largely under-analysed, despite its potentially more disruptive impact.¹

However, parliaments are making some steps forward using proofs-of-concept for testing operative tools equipped with new AI solutions for main three purposes:

1. Administrative tasks, minimizing the burden of the administrative tasks entrusted to civil servants, while optimizing efficiency and improving the quality of the administrative services delivered. AI can be used to automate many repetitive jobs (e.g., typing transcripts of an assembly meeting), delegate some very time-consuming activities (e.g., summarising amendments and arranging them in a proper order), and preprocessing some intellectual tasks (e.g., consolidating of a draft law).
2. Legislative tasks, supporting the legislative initiatives of decision-makers and of members of parliament. AI helps us bring out hidden legal knowledge that, owing to the complexity of the legal system, cannot be easily identified and managed. We can use AI to retrieve pertinent legal sources (e.g., through eDiscovery), simulate the application of a new bill and so evaluate all the potential effects of its application, check for compliance with existing norms, or assess how well any set of norms advances policy goals or how consistent these norms are with such goals (e.g., fighting climate change or ensuring gender equality).
3. Participation tasks, helping citizens, businesses, and institutions easily access and understand the laws and regulations that apply to them. Using a chatbot or conversational interface portal, end-users can query the normative-system database depending on what their needs are. The query-answering system can support information retrieval and some legal-reasoning portals can return useful information about a specific case.

¹ [137] Fitsilis, F., Gomes Rêgo de Almeida, P. (2024). Artificial intelligence and its regulation in representative institutions, in Charalabidis, Y., Medaglia, R., van Noordt, C. (eds.), *Research Handbook on Public Management and Artificial Intelligence*, Edward Elgar Publishing, 151–166

Considering the fundamental role of parliaments in democratic systems, it is crucial to be able to analyse innovation and the state of the art in AI through the lens of general principles of law, with a particular emphasis on the theory of law and constitutional theory. If we allow technology to shape the legal domain without a solid grounding in legal theory, we risk weakening the values that support democracy and the rule of law. By placing the use of AI in parliamentary processes within a constitutional framework, and understanding its role within that framework, we ensure that technological progress strengthens, rather than undermines, the foundation of our legal systems.

In light of that background, we should be able to appreciate that AI systems² applied in the parliamentary domain need to follow guidelines³ for monitoring and governing the entire production workflow, from the point where the dataset is selected to the point where legal experts evaluate the results. For this reason, parliaments with a strong digital-transformation roadmap are better equipped to face this disruptive onslaught of the AI age, having the infrastructure, skills, organization, and culture needed to face that challenge. Likewise, if we are to make AI effective, we need a solidly digitized document system, using advanced LegalXML standards and semantic web technology for annotating legal knowledge. With a parliament based only on paper processes, it is impossible to harness the power of the AI revolution.

We thus have start from the qualified and annotated legal datasets obtained from previous research and technologies that over the last decades have been applied in the effort to digitize parliamentary tasks: these are now the foundation on which to build in seeking to enhance the lawmaking process with assistive AI tools. If we jump directly to generative AI tools, we risk not capitalizing on the enormous assets of legal knowledge embedded within digital documents. The work the AI and law community has done over the last thirty years is therefore fundamental in laying the necessary groundwork for a correct deployment of AI in parliament.

After all, over the last decade we have witnessed an evolution in the digitization of legal sources, especially in parliaments and in legislative-drafting offices, in an effort not only to improve the quality of legal sources published online but also to redesign the workflow with a view to digitizing the flow of documents.

² A defined in the art. 3 of the AI Act of the European Union, Official Journal (L), 2024/1689, 12.7.2024, ELI: <http://data.europa.eu/eli/reg/2024/1689/oj>.

³ See the AI Guidelines for Parliaments: <https://www.wfd.org/ai-guidelines-parliaments>, Westminster Foundation for Democracy, 2024.

From digitization in parliaments to AI through open data

The process of documentary digitization has been the necessary forerunner of the current embrace of AI in parliaments. This process has gone through several phases:

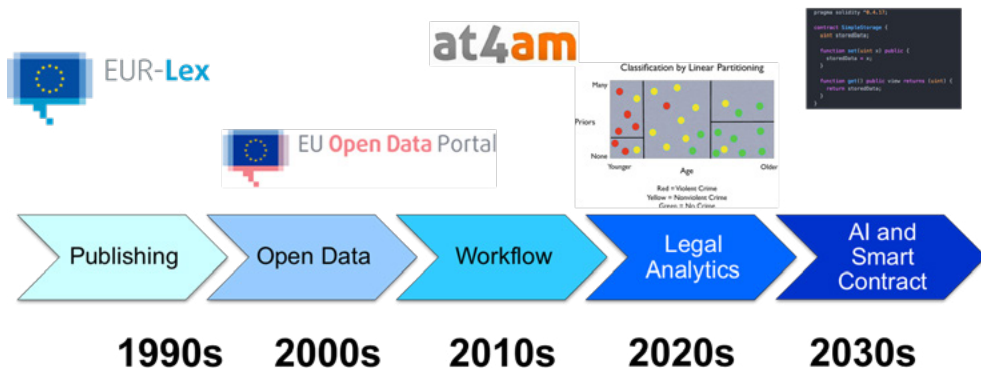


Figure 1 – Evolution in the digitization of legal sources

In the 1990s the official journals focused on publishing legislation online on the Web in order to implement the principle of accessibility, and parliaments also followed this trend to enhance the transparency of parliamentary activities. Subsequently, the main goal for sharing legal sources was to ensure open access to law online using the Web: this was the Web of Data approach (Filtz 2020, 2021,⁴ Livermore 2019),⁵ creating open data collections of documents and legal ontologies.⁶ We then applied the same standard to effect a deep digital transformation of the lawmaking process, while enhancing workflows between institutions. The fourth step consisted in using all the open data and the legal document structure represented in open standards to enable legal data analytics and create new AI applications by using these legal big data, as well as to transform selected procedural rules into smart contracts that are

4 Filtz, E., Kirrane, S. & Polleres, A. The linked legal data landscape: linking legal data across different countries. *Artif Intell Law* (2021); Filtz, Erwin, María Navas-Loro, Cristiana Santos, Axel Polleres, and Sabrina Kirrane. (2020). Events Matter: Extraction of Events from Court Decisions. *Jurix*: 33-42.

5 Livermore, M. A., Rockmore D. N. (2019). *Law as Data: Computation, Text, and the Future of Legal Analysis*, Santa Fe Institute Press.

6 See the Open Data portal of the European Parliament in Linked Open Data modality: <https://data.europarl.europa.eu/en/home>. One of the early Open Data portals in Parliament was the Chamber of Deputies of Italy <https://dati.camera.it/en> and the Italian Senate <https://dati.senato.it/sito/home>. In 2021 the Open Government Partnership released the Memorandum on Parliamentary Engagement <https://www.opengovpartnership.org/documents/memorandum-on-parliamentary-engagement/>. The Congress USA has a portal where to publish open data <https://www.congress.gov/help/using-data-off-site>.

immediately executable and enforceable (see <https://dati.senato.it/sito/home>, providing an RDF format, ontology, and AKN bulk in GitHub).

Several official journals, national archives, and parliaments have sought to manage legal sources within legal corpora by using technologies like databases, XML, RDF-metadata, and logic formulas. Subsequently, they also set out to provide updated versions of the law at any moment in time (the so-called point-in-time mechanism). Using Formex, an SGML data standard now translated into XML (Formex v4) and integrated with ELI⁷ and ECLI,⁸ Eur-Lex began to consolidate the European legislation database in 1999 and is now moving the whole document collection to Akoma Ntoso using AKN4EU. Today the Publication Office of European Union is experimenting with LLM for marking up the AKN4EU and for producing the consolidated versions (AI4XML project). Emilia-Romagna Region (Italy) started to consolidate regulations back in 2003 using the NormeInRete⁹ (NIR) XML schema, and it now promotes an important LLM project called SAVIA¹⁰ to support information retrieval for relevant legislation using a conversational chatbot. The Italian Senate adopted the Akoma Ntoso standard for bills, transcripts, and other kinds of documents also provided in Open Government Data and is now promoting the use of AI within Parliament to extract amendments during the bill changes. On 30 June 2009, the Brazilian Senate launched the parliamentary consolidated database (LexMLBrazil)¹¹ with a point-in-time function based on a customization of the XML Akoma Ntoso schema, and now some experiments with ChatGPT have been developed. The UK's National Archives have progressively been transforming all UK legislation into XML, RDF, and Akoma Ntoso since 2012. Recently, even case-law has been managed in AKN. Legislation in XML format makes it possible to take advantage of large annotated corpora in drafting new bills, favouring the consolidation of the amending draft bill. AI in general, and LLM specifically, can improve this task, which is under experimentation in the UK. In 2017, the United Nations approved Akoma Ntoso as the official standard for their documentation (AKN4UN),¹² and EU institutions launched a similar project in 2018 under the AKN4EU initiative. The WHO has been transforming all the workflow processes using AKN4UN to detect

⁷ ELI Task Force (2018) ELI implementation methodology: good practices and guidelines. Publications Office.

⁸ Van Opijnen M., Palmirani M., Vitali F., Van Den Oever J., Agnoloni T. (2017). Towards ECLI 2.0. Conference for E-Democracy and Open Government CeDEM (2017), 135–143.

⁹ NIR - https://www.agid.gov.it/sites/agid/files/2024-06/Linee_guida_marcatatura_documenti_normativi.pdf

¹⁰ Visciarelli Michele, Giovanni Guidi, Laura Morselli, Domitilla Brandoni, Giuseppe Fiameni, Luisa Monti, Stefano Bianchini, Cosimo Tommasi, SAVIA: Artificial Intelligence in support of the lawmaking process, CEUR, 2024, <https://ital-ia2024.it/submission/539/paper>

¹¹ <https://normas.leg.br/> <https://www.lexml.gov.br/>

¹² <https://unsceb-hlcm.github.io/>

the “obligation to make periodical reports.” Especially within the WHO Assembly, AKN documents improve interoperability between institutions, member states, and stakeholders by making it possible to uncover valuable hidden knowledge. Moreover, LegalXML modelling provides a robust and solid digital serialization of legal documents by applying principles of legal theory to annotate legal knowledge (e.g., temporal parameters, semantic Web annotation, document structure, normative citations). In February 2024, the Italian Chamber of Deputies launched an expression of interest in experimenting with generative AI¹³ to support legislative initiatives by deputies and the operational tasks of the legislative offices. The Chamber of Deputies and the Italian Senate are now developing proofs-of-concept for the use of LLM to automatically extract amendments from the modified bill and to order and classify the amendments.

AI and the Legislative Process in Parliaments

Over the last thirty years, AI & law communities have developed widely shared theories and models capable of managing norms, values, principles, beliefs, interpretation, and argumentation (Sartor, Prakken, Rotolo, Boella, van der Torre).¹⁴ Other scholars use ML/NLP/AI nonsymbolic techniques to extract, classify, and analyse legal knowledge and legal norms starting from the text (Ashely 2017).¹⁵ Many members of the AI & law community have developed logic theories and methods for modelling norms in legal formulas and have also developed tools for managing the legal reasoning interaction with legal experts (Governatori, Palmirani, Boella).¹⁶ Some research projects have been started importantly investigating “law as data” to extract data from legal texts and improve information retrieval based on semantic

¹³ <https://comunicazione.camera.it/eventi/intelligenza-artificiale-camera-incontro-pubblico-manifestazione-interesse>

¹⁴ See the large literature of Artificial Intelligence and Law Journal. <https://link.springer.com/journal/10506>

¹⁵ Ashley, K. (2017). *Artificial Intelligence and Legal Analytics: New Tools for Law Practice in the Digital Age*, Cambridge University Press.

¹⁶ Governatori, G., P. R. Casanovas, L. de Koker (2020). On the Formal Representation of the Australian Spent Conviction Scheme. In: Gutiérrez-Basulto, V., T. Kliegr, A. Soylu, M. Giese, D. Roman, Eds. *Rules and Reasoning. RuleML+RR 2020. Lecture Notes in Computer Science*, vol 12173. Springer.

and legal ontologies (Palmirani 2018, 2018a 2020, 2022,¹⁷ Liga 2019, 2019a).¹⁸ The Lynx project¹⁹ aims to translate a legal system into a knowledge graph; ManyLaws²⁰ combines different types of legal metadata to improve searchability. What is new in these research endeavours is the aim to codify normative thought directly using programming languages without passing through any legal language. OpenFisca²¹ undertakes to codify significant fragments of the legal system by way of programming, and Marcell,²² for example, uses AI to improve multilingualism in legal documents. These projects are currently isolated and not well integrated into a single research vision. Specifically, they do not fully include the philosophy of law, legal theory analysis, or constitutional law, nor have they created a robust legal framework for digital legal systems, one that is dynamic and diachronic, takes multilingual perspectives into account, and is responsive to the multiple interpretations and meanings of which these systems are susceptible. The ERC project CompuLaw²³ is one of the more advanced projects that take an interdisciplinary approach including legal-techno-social aspects. However, it is more focused on logic-symbolic and nonsymbolic modelling of norms integrated with AI techniques like predictive law and ejustice. The ERC project HyperModeLex²⁴ is focused on the legislative domain. Communicating AI results becomes a fundamental task in light of the transparency and explicability principles contained in the Artificial Intelligence Act (AIA)²⁵ (see Arts. 13 and 14: Human Oversight). It is important to mitigate the “black box” effect (Pasquale 2015, Sovrano 2021, 2024). The legal-design approach and methodology (Hagan 2020),²⁶

17 Palmirani, M., M. Martoni, A. Rossi, C. Bartolini, and L. Robaldo (2018). Pronto: privacy ontology for legal reasoning. In International conference on electronic government and the information systems perspective, 139–152. Springer. Palmirani, M., R. Sperberg, G. Vergottini, F. Vitali (2018a). Akoma ntoso version 1.0 part 1: Xml vocabulary. OASIS standard, August 2018. Palmirani, M., Sovrano F., Liga, D., Sapienza, S. and Vitali, F. (2021). Hybrid AI Framework for Legal Analysis of the EU Legislation Corrigenda, JURIX2021, IOS. Palmirani, M., A Smart Legal Order for the Digital Era: A Hybrid AI and Dialogic Model, in “Ragion pratica, Rivista semestrale” 2/2022, pp. 633–655, doi: 10.1415/105387.

18 Liga, D., M. Palmirani (2019). Classifying argumentative stances of opposition using Tree Kernels. In ACAI 2019: Proceedings of the 2019 2nd International Conference on Algorithms, Computing and Artificial Intelligence, 17–22. Liga, D., M. Palmirani (2019a). Detecting “Slippery Slope” and Other Argumentative Stances of Opposition Using Tree Kernels in Monologic Discourse. In Rules and Reasoning. Third International Joint Conference, RuleML+RR 2019.

19 <https://lynx-project.eu/>

20 <https://www.manylaws.eu/>

21 <https://openfisca.org/en/>

22 <https://marcell-project.eu/>

23 <https://site.unibo.it/compulaw/en/project>

24 <https://site.unibo.it/hypermodelex/en>

25 European Commission, Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts (COM(2021) 206 final) (hereafter AIA).

26 Hagan, M. (2020). Legal Design as a Thing: A Theory of Change and a Set of Methods to Craft a Human-Centered Legal System, Design Issues 2020 36:3, 3–15.

based on graphics and human-computer interaction pillars, are oriented toward favouring the ability to communicate legal knowledge using visualization and dynamic interfaces. This visual approach permits a better understanding of the AI results in light of human oversight and human-in-control principles and guarantees the autonomy of decision-makers.

Rules as Code, Law as Code, and Digital-Ready Policy

We need to go beyond the state of the art of the current theory of law in parliaments and take on the challenge of the “coding of the law”²⁷ by building a solid IT-based legal framework supported by the philosophy of law, the theory of law, ethics, constitutional law, parliamentary regulation (Micklitz),²⁸ and a clear roadmap (Von Lucke 2023).²⁹ However, there are at least three competing methodologies at present:

Rules as Code. The legislative process is modelled with flow-chart analysis and coding for a better understanding of the implications of legal enactment and with a view to producing “computable law” that is easy to integrate into information systems (e.g., eGov services).

Law as Code. On this approach, the legislative process starts with the drafting of legal text in such a way that this normative text can then be converted into machine-computable format (e.g., Akoma Ntoso, USML, etc.).

Digital-Ready Policymaking.³⁰ The lawmaking process is fashioned in such a way as to make it possible to check whether the legislative enactment at issue is consistent with the policy goals it is meant to achieve, to which end it seeks to predict the effects the enactment is going to have on society. The approach relies on principles of human-computer interaction and calls for simplified legal language in designing the law.

Parliaments need to decide which approach is best suited to their needs in view of the type

27 Savelka, J., Grabmair, M. and Ashley, K. (2021) “A Law School Course in Applied Legal Analytics and AI”. *Law in Context*, 37 (1): 1-41.

28 Micklitz H-W, Pollicino O, Reichman A, Simoncini A, Sartor G, De Gregorio G, eds. *Constitutional Challenges in the Algorithmic Society*. Cambridge University Press; 2021.

29 Von Lucke J., Fitsilis F., Etscheid J., ‘Research and Development Agenda for the Use of AI in Parliaments’ (Proceedings of the 24th Annual International Conference on Digital Government Research, Gdańsk, Poland, July 11-14, 2023) 423 <https://dl.acm.org/doi/10.1145/3598469.3598517>

30 <https://joinup.ec.europa.eu/topic/digital-government/digital-ready-policymaking>

of law that needs to be modelled. Each approach has its pros and cons. The rule-as-code approach is easily computable using automatized software, but it is also less flexible in responding to changes in the law. The law-as-code approach is flexible and particularly suitable when it comes to modelling norms and principles liable to multiple interpretations. The digital-ready approach is a managerial and service-oriented approach focussed on laws and regulations in specific subject areas (such as banking and education).

A Hybrid AI Approach in Parliaments

The above-mentioned approaches have the potential to bring great advantages and advance the take-up of AI, especially nonsymbolic AI (machine learning, deep learning, large language models). AI is evolving at a rapid pace, and it is becoming increasingly clear that for better results in the legal domain we need to rely on a hybrid technical framework that combines machine learning, deep learning based on stochastic technologies, and LLMs with semantic knowledge modelling, legal reasoning, and a symbolic rule-based approach (Palmirani 2020, Ashley 2020, Verhij).³¹ Retrieval augmented generation (RAG) definitely supports the task of updating and training LLMs with the most relevant documents in the legislative system. However, the main problem with the current applications of nonsymbolic AI (ML/DL/LLM) in the legal domain is the lack of contextual information. This affects the ability to create useful relationships between different annotations, classifications, clusterings, correlations, and regressions.

In more detail, the main problems in the current state of the art in ML/DL applications for legal documents include the following:

- ML/DL/GenAI works without **semantics**, and much of the contextual information contained in the legislative document is neglected, with a significantly reduced capacity to interpret similar concepts (e.g., palliative care, hospice care).
- **Legal citations** are a consolidated best practice in legal disciplines, which entrust some important meta-roles to external textual resources (e.g., definitions, derogations, modifications, integrations of prescriptiveness, penalties, and conditions). This means that ML/DL/LLM should also consider the cited text, especially considering that some algorithms (e.g., similitude, grouping) can find similarities in texts

³¹ <https://hybridintelligence.ewi.tudelft.nl/>

(e.g., “art. 3” and “art. 13”) when the content is completely different. For this reason, the network of norms through citations should be included in the baseline of the experiments.

- **Temporal parameters** are fundamental to creating a robust ML/DL dataset. The repealed acts should have less importance in the probabilistic model rather than the updated codifications. Frequency, probabilistic calculus, and temporal series should therefore be mitigated on the basis of criteria of relevance and legal validity (e.g., entry into force, date of applicability).
- **Logic** and semantic web annotation needs to also be integrated with ML/DL in order to make it possible to understand the type and meaning of relationships that connect different sentences in the text (e.g., obligation and penalty, obligation, and derogation).
- In the legislative domain it is essential to take account of **context**. In legislative provisions we find frequent conditions (e.g., jurisdiction exclusion in the UK) or logic operators (e.g., the Boolean connectors “and,” “or,” and “xor” in legislative definitions) that are neglected by LLM.
- **Legal language** is different from the ordinary language, and the LLM/GENAI technique depends on a tokenization process that differs from language to language (e.g., the German word *Rindfleischetikettierungsüberwachungsaufgabe* is a compound of several words). The legislative language changes from one legislature to the next, and these differences include the political narrative tone. For this reason, LLMs cannot have the same accuracy across different bodies of law enacted by different legislatures.
- There are **implicit legal rules** embedded not in the legal language but in the institutional rules, in the powers granted under constitutional law or in an assembly regulation, in the hierarchy of legal sources as defined in the theory of law. These rules need to be added to the ML/DL/LLM using a rule-based approach.

For these reasons, a hybrid architecture, one that includes symbolic and nonsymbolic AI, is strongly advocated in integrating ML/DL legal knowledge with semantic Web annotation and

legal deontic logic modelling (Deakin 2020).³² As a common interchange LegalXML standard, Akoma Ntoso could be a good bridge for creating a common annotated digital corpus for robust AI applications.

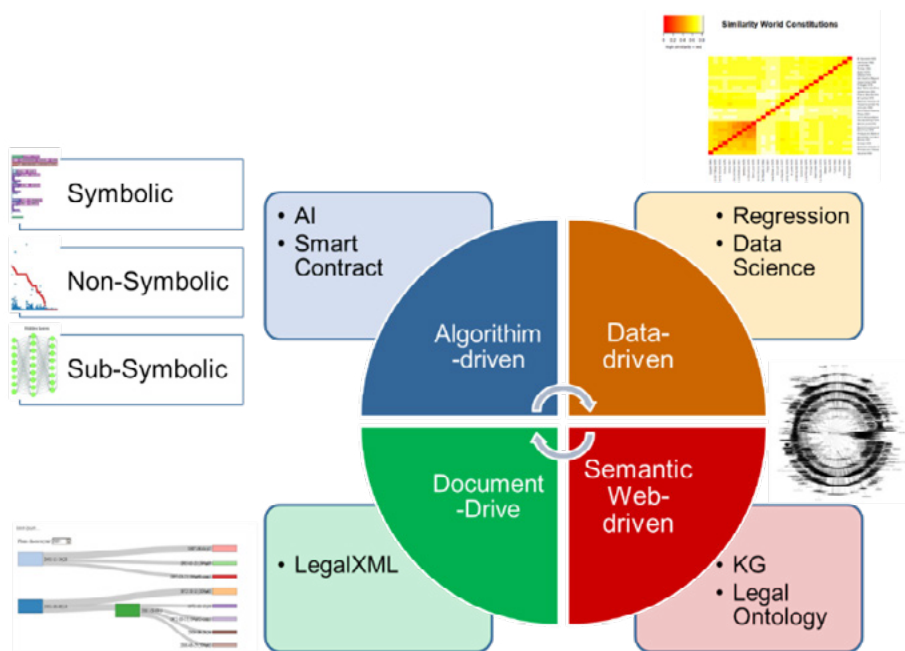


Figure 2 – AI and the legal domain

Conclusions

AI is growing rapidly in many human activities and also within parliaments, where it is being used to support administrative, legislative, and communication tasks. Parliaments need to have a roadmap for deciding which methodology is best for them (e.g., digital-ready policies) in view of the legal tradition and the type of scenario they are dealing with. Additionally, they need to have clean technical frameworks (e.g., hybrid AI) for mitigating several risks (e.g., bias, discrimination, poisoning data, manipulation of AI models, lack of explicability). Finally, in carrying out different projects, guidelines need to be followed so as to ensure compli-

³² Deakin, S. and Markou, C.: Is law computable? Critical perspectives on law and artificial intelligence, Hart Publishing, (2020).

ance with ethical, legal, and democratic principles (e.g., autonomy of legislative decisions, the legitimacy of the process, the sovereignty of the infrastructure).

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