

Using Artificial Intelligence for Legislation - Thinking About and Selecting Realistic Topics

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Abstract

Parliaments are currently investigating the use of applications based on artificial intelligence (AI) technologies to perform certain tasks. Reflecting on conceivable tools, fields of application, usage scenarios and needs, it is reasonable to expect AI-induced changes in parliaments. This makes even more peculiar the fact that the introduction of AI in parliaments is a generally under-researched topic. This article contributes to the bridging of this gap by presenting empirical evidence for the future use of AI-based tools and services in the legislation workspace. The data were collected during a brainstorming exercise and a virtual workshop in 2021. The analysis sheds light in the prioritization of AI-based technologies within the parliamentary environment. In the course of the study, the relevance and the priority of more than 210 applications and topics of AI technologies in parliament have been investigated for several parliamentary sectors, including 36 proposals around law-making competencies and procedures, dubbed as “legislation”. The main findings regarding legislation are presented.

Keywords

Artificial Intelligence, Parliament, Legislation, Digital Twin of Law

1. Introduction


When performing parliamentary tasks, parliaments have so far been free to decide whether they also want to rely on artificial intelligence (AI) and AI-based applications. In the parliamentary routine, such AI-based application systems would be able to automatically become aware of certain events, notify third parties, recommend actions, make prognoses, initiate precautionary measures, and make certain decisions even without the involvement of people. All of this could also happen nearly in real time [1].

At present, there are still only a few concrete visions or guiding images. There is therefore a lack of guiding pictures for the future use of AI in parliaments and, in particular, in legislation. Guiding images would be important, however, because they are ideas or embodiments of desirable ideal-typical states that have both a guiding and an image function. In this way, they offer a framework for orientation, from which certain freedoms also arise and perspectives emerge. Guiding ideas should express confidence and a spirit of optimism, but they should also represent a challenge and signal a willingness to change [2].

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If one reflects on potential tools, fields of application, usage scenarios and requirements, AI-induced and disruptive changes can also be expected for parliaments. In order to deal with these changes at an early stage and thus gain a broad overall view, those responsible should examine the corresponding approaches, potentials and visions for parliaments and, in particular, in the context of the wider legislative process. So where to start?

Brainstorming workshops are a good way to gain an initial overview of the areas and fields of application in which the use of AI in parliaments and legislation would be useful. Moreover, workshops with selected national parliaments are recommended for ratings and comparative analyses. In this way, assessments by the relevant stakeholders from the field can be collected and analyzed. This analysis sheds light in the prioritization of AI-based technologies within the parliamentary environment. Prioritization is important because parliaments as organizations seem to miss the critical "market" mass, the expertise as well as the funding to parallelly develop several AI-solutions to satisfy all possible needs. The results can also be used to generate a roadmap for the introduction of AI in national parliaments, created and reflected under scientific supervision.

2. Literature Review

According to the Cambridge dictionary [3] artificial intelligence is used to describe the study of how to produce machines that have some of the qualities that the human mind has. Behind this, however, is neither a single technology nor a collection of niche applications. Rather, numerous technologies are assigned to AI today [4, 5]. They are now found in numerous mainstream applications, underscoring the relevance and necessity of scientific and practical contributions to AI.

Because representative institutions have significant similarities among themselves, lessons learned from the use of AI can be transferred and applied economically. There are now initial surveys on the prioritization of advanced technologies for parliaments [6]. Large sections of society already use these technologies willingly, in some cases even unknowingly. In this respect, parliamentary use of AI can no longer be regarded merely as a possible option but must be considered as a matter of high priority.

It looks like parliaments are feeling the societal pressure and starting to respond by analyzing the opportunities and challenges in the use of AI. In 2020, the Parliamentary Assembly of the Council of Europe (PACE) adopted a series of practical proposals in the form of resolutions and recommendations to balance the risks posed by the application of AI in democratic environments, which have effects on human rights, democracy and the rule of law [7, 4]. For the same reason, the Global Parliamentary Network of the Organization for Economic Co-operation and Development (OECD) established a thematic parliamentary group on AI in 2019 [8].

Well-structured parliaments with sufficient budgetary resources may be better off in responding appropriately to these challenges. Some institutions, such as the Parliament of Victoria [9], have begun studying them to improve their understanding and plan their digital evolution accordingly. In April 2021, after extensive public consultation, the European Commission [10] presented a proposal for an artificial intelligence act, which still has to go through the parliamentary procedure of the European Parliament. In this respect, the European Parliament

may be the most thoroughly informed representative institution on AI-related issues at present. It has adopted several relevant resolutions and has a well-manned and capable parliamentary administration including the European Parliament Research Service [11].

Although several parliaments seem to recognize the need to introduce AI [12], there are so far only a few examples of actual implementation of such technologies in the parliamentary workspace. The European Parliament's Archives Unit developed software solutions to support the analysis of large corpora of archived documents [13]. The Italian Senate introduced AI services based on machine and deep learning. These services include classification of laws and amendments, similarity checks and the use of markup elements (tags) (see for example [14]). The Finnish Parliament's Future Committee held a "parliamentary hearing" with AI instances on the issues of the United Nations 2030 Agenda and the challenges of using advanced technologies [15].

Nevertheless, it would be wrong to assume that the epicenter of AI tools and services can only be located on the European continent. In 2019, the Brazilian Chamber of Deputies launched Ulysses, a set of AI tools to improve the legislative process and to interact with citizens. Ulysses offers several modules, such as for thematic organization of content, electronic surveys, collecting citizen input throughout the legislative cycle, identifying the needs of parliamentarians during the legislative process, and more [16, 17]. Other existing AI applications in the legislative sector include the use of chatbots in the Parliament of South Africa to assist Members of Parliament (MPs) with parliamentary information and the comparison of bills, interpretation of references and execution of amendment instructions in the United States House of Representatives [18].

Also, when it comes to regulating AI, parliaments can become leading institutions. Due to the complexity of the matter, it is advisable to set up specialized commissions, committees and processes for this purpose (see for example: [19, 15, 20]). When discussing AI, one must inevitably talk about data and data spaces. In any organization that handles data, this is linked to the availability of appropriate professionals who deal with data quality and protection (see for example: [21]). In addition, specific processes are required to adequately assess the risks and principles associated with data governance [22, 4, 23, 24].

This exemplary presentation of use cases already shows the dynamics of AI applications around legislation. However, an expansion of the perspective to the entire field of parliamentary activity suggests itself, because the use of AI can make sense in a variety of parliamentary tasks and competences. Yet, there is no systematic or strategic dimension in the literature about the introduction of AI in the parliamentary workspace. This study closes this gap.

3. Research Approach

At the beginning of the study, the research concept was not finalized but it developed in an agile manner. The initial question was about the research approach that would be best suited to compiling the variety of possible applications for AI in legislation. As technologies and algorithms evolve rapidly, a technology-agnostic study was opted. Moreover, it should not only be about a collection of existing solutions, but also a collection of ideas for the future AI-based design of legislation. Such ideas and perceptions are suitable for use as guiding pictures that can

be further developed into long-term visions, thus providing the foundation for design-oriented approaches and impact assessments.

For the open collection of ideas, the brainstorming method invented by Alex Osborn and further developed by Charles Hutchison Clark [25] is recommended, in other words a group discussion in which spontaneous ideas about a particular problem are collected. It was challenging to find suitable experts to explore the broad possibilities of the use of AI in parliaments in a reflective and design-oriented way. This requires expertise built up through studies, own research, practical experience and professional exchange. It was nonetheless possible to bring together a small group of three experts from academia and parliamentary practice who met these requirements. In times of the pandemic, the moderation software XLeap (<https://www.xleap.net>) was used as a cloud-based online variant for brainstorming with an integrated audio conference, which enabled a collection of ideas, their clustering and sorting. In a first round of exchange, broad ideas for the use of AI technologies in parliaments were collected and then sorted. The second round included a joint review of all contributions, an open reflection and a complementation.

A different method was required to determine the benefit, relevance and necessity of the generated proposals. A utility analysis, in other words an analysis and evaluation procedure for complex decision-making situations, is suitable for the purpose. Through a systematic decision preparation and decision-making process, the selection among different, complex solution alternatives is thus made easier [26]. For implementation, an XLeap-based utility survey on relevance and priorities is recommended. For each entry, the relevance of the proposal was asked on a scale from 0 (irrelevant) to 10 (must-have), whereas the priority of implementation was required on a scale from 0 (2020) to 10 (2030). XLeap then provided the corresponding evaluation results as tables and graphics. Further stand-alone and comparative evaluation of the individual scores was conducted by the researchers.

In a final step, the refined results from the above expert team (in terms of a structured list of proposals) were presented to a wider set of parliamentary experts with different expertise and knowledge backgrounds. Therefore, in March 2021, a workshop in Athens with stakeholders from around the national Hellenic Parliament was successfully organized. Due to the pandemic and for methodological stability, the XLeap modality was again used, with linguistic adjustments. Again, the relevance on a scale from 0 (irrelevant) to 10 (must-have) and the priority of implementation on a scale from 0 (2020) to 10 (2030) were asked for each proposal. The results were presented to the participants directly after each block vote and the first impressions were briefly discussed. [27]

4. Brainstorming Results

On the basis of the original research concept, it took some time to identify the team of experts, recruit them for the research project and invite them to a virtual brainstorming workshop. On 14 July 2020, a four-hour online brainstorming session could be organized, with the participation of three proven experts. The first open question was: "Which are the fields of application for AI in the work and environment of parliaments?" Overall, 196 contributions were collected. First, any duplications were eliminated and so the number was reduced to 181. Subsequently, the

ideas were clustered into thematic areas. Within the framework of a revision, all entries were reviewed, discussed and partially revised. The final clustering included 210 entries that belong to nine areas: Parliamentarians (13), Legislation (36), Parliamentary Control and Parliamentary Diplomacy (14), Civic Education and National Culture (17), Parliamentary Administration, Parliament Buildings, Driving Service and Police (37), Parliamentary Bureau & Parliamentary Directorates & Elections (19), Scientific Services (13), Framework (47), Open Questions (14).

This article is dedicated to the analysis of the thematic field of legislation within the parliamentary workspace and consists of 36 proposals from the sub-topics of the Legislative Process (30) and the Digital Twins of Legislation (6). As such, it includes tasks around the making and documentation of laws. AI-based tools and services can help to further streamline the legislative process.

5. Hellenic Parliament Assessment Results: Legislation

Eight months after the brainstorming workshop, a virtual workshop was held in Athens on 18 March 2021 with staff related to the Hellenic Parliament to evaluate the above proposals for the first time. The 14 participants, 9 men and 5 women, came from seven different parliamentary sectors. MPs and their staff were also invited to represent the demand side of parliament. There were also external consultants with a high interest in the use of information technologies in the legislature.

First, the previous procedure and the aim of the rating were presented. The participants then individually evaluated all 210 AI-related solutions and approaches for the parliament of the future, each divided into blocks covering the nine topic areas. Filling out the questionnaire was anonymous.

In the evaluation of each of the 210 proposals, one utility value was asked for relevance and one for priority. For both parameters, a value scale (Likert scale) from 0 to 10 was used. Each of these value scales can thus be linked to different but appropriate units. The first question was: "Rate the proposals according to relevance". Relevance measures the degree of importance of the proposal on a scale from 0 (irrelevant) to 5 (relevant) to 10 (must-have). In addition, participants were asked to give the lowest score to solutions that they did not understand or thought were unjustified to use. The second question was: "Rate the proposals by priority". The deadline for priority can be set with a year as a date. In this second case, the scale ranges from 0 (2020) to 5 (2025) to 10 (2030) that can be converted into a concrete date. Suggestions that should not even be implemented from the participants' point of view may be rated with the maximum value of 10. Table 1 shows the Top-4 evaluation results in terms of relevance in the area of legislation.

6. Discussion: Findings, Contribution and Comments

The results of the brainstorming and the evaluation of the participants' choices from the environment of the Hellenic Parliament underline a remarkably high interest in AI for legislation. The Top-4 have received a relevance score of 8.5 or better on a scale from 0 to 10. The cut-off point of 7.5 or better contains the top 19 of 36 proposals (52.7%). The lowest value is 6.07 and thus still above the middle rating 5 (relevant). Although all standard deviations are above 0.10,

Table 1
Multi-Criteria Table for Legislation. Top-4 sorted by Results

Nr	Item	Relevance		Priority	
		0..10 ↓Ø	SD	31.12.20-31.12.30 Ø	SD
1	Intelligent examination of legislative proposals for possible impacts with other regulations	8,57	0,12	02.07.2023	0,19
2	Transformation of legislation (code) into machine understandable e-code	8,57	0,20	16.10.2023	0,24
3	Smart Law	8,50	0,13	31.12.2023	0,25
4	AI-based transparency of parliament and parliamentary procedures	8,50	0,16	26.01.2024	0,28

this indicates a divergent assessment, which is, however, kept within manageable limits. The proposal on digital twins of law at sub-national level displays a higher standard deviation (0.30). This is presumably due to the fact that the parliament does not possess any relevant competence.

With regard to priority, also to be related with implementation expectations, it can be observed that the participants set target dates in the years between 2023 and 2026 that corresponds to a period of one to four years and, thus, within a manageable planning horizon. The date of the next parliamentary elections in spring 2023 might have played a role. The maximum value of 10 years (2030) was rarely selected as a target. It is also remarkable that only twice in 36 proposals standard deviations of 0.30 and higher were found. At the same time, a certain correlation between relevance and priority can be seen in the visual analysis. Higher priority proposals should also be implemented more quickly. Projects with lower priority are given more time for implementation. Overall, a tight cluster between the values 6-9 (relevance) and 2-6 (priority) has formed. In the follow-up to the workshop, all proposals were developed separately. Of particular interest, however, is the Top-4 that is shown below.

6.1. Intelligent examination of legislative proposals

AI-based review services analyze draft legislation and compile all relevant legal regulations and laws that are affected by the proposed legislation. Relevant passages are compiled in a brief report. In a further legislative impact assessment stage, effects on existing statutory regulations are predicted. In addition, it can be checked whether there are any judicial decisions that oppose the proposed legislation. Such complex projects are nowadays only possible, if at all, via complex legal information systems, the use of modern document standards such as Akoma Ntoso and semantic web standards. The complexity and the previous time- and labor-intensive burden of the relevant investigations make “intelligent audits” particularly attractive to parliamentary legal experts. In addition, several experts of the Hellenic Parliament are members of the Hellenic OCR Team (<https://hellenicOCRteam.gr>), a research group that has already worked on such concepts.

6.2. Transformation of legislation (code) into machine understandable e-code

Future smart legislation (smart law) requires a machine-comprehensible, electronic legal text (e-code) to enable computers to process, interpret and assess the consequences of the law. AI can contribute to the transformation of legislative texts into a code that can be understood by computers. Currently, there are first standards for e-codes (see LegalDocML and LegalRuleML) and the Hellenic Parliament has been participating in forward-looking research projects for more than a decade. The participation in the ManyLaws project (<https://www.manylaws.eu>) was of particular importance, through which an Akoma Ntoso-based codified version (e-code) of a collection of Greek, Austrian and EU legislation was created. Some of the workshop participants have contributed to the project and therefore consider this AI service as highly relevant.

6.3. Smart Law

Smart Law is based on a collection of electronic legal texts (e-code) that can be understood by machines. These must correspond to a 1:1 translation of the applicable legal texts (code). Computers are thus enabled to process and interpret laws and to evaluate their effects. A precondition for such a project is the publication of electronic legislative texts in a standardized format. AI-based analyses using text analysis tools or more semantic investigations to prove legal interactions can help to speed up legal/technical investigations (for instance within the framework of parliamentary research services) and draw attention to referencing errors.

6.4. AI-based transparency of parliament and parliamentary procedures

With AI-based support, the processes, the status of negotiations and the arguments exchanged in all parliamentary legislative procedures are made visible. However, such a transparent analysis of parliament does not include the internal political negotiating positions of the parties and negotiators, which should also remain confidential during the sessions, if only for tactical reasons. Currently, there is no transparent overview of the status of negotiations and an AI-based visualization could provide significant benefits for all stakeholders. Transparency is a core value of the Hellenic Parliament and takes on a central position in its latest strategic plan 2018-2021 [28]. It is also openly advocated by its leadership and serves as a guiding principle in the parliament's multipolar interaction with the general public. Therefore, this option performed well on average, although not as well as the previous ones, as it lacks the necessary precision to pinpoint useful tools and services with which administrators can identify.

7. Conclusion and Outlook

With a creative research approach, an expert brainstorming team and an innovative parliamentary environment, 36 constructive proposals for the future use of AI to improve legislation were gathered and evaluated with a view to relevance and priority. In the present time, the collection can help, especially the Hellenic Parliament, to determine in which areas to focus research and where AI-based innovations urgently need to be initiated with a view to a more efficient legislation. Overall, this provides a good foundation for a research agenda on AI in the

area of the legislation. Unfortunately, the use of AI in the legislature can also have negative consequences, which must be anticipated and limited.

All four options prioritized by workshop participants constitute the “tip of the iceberg” of AI-based apps and services linked to the legislative sector. The relative differences in the relevance factor among these options are small, yet significant enough to justify their detailed presentation. For the Hellenic Parliament this selection can cause implications in two fronts:

- When updating the parliament’s strategic plan: Based on this study, AI-based tools and services need to be considered to be part of the parliament’s strategic goals and choices. For instance, AI-based transparency and smart law can be included as direct proof of an extrovert and accountable representative institution.
- When planning for the organization’s next generation ICT systems: As discussed above, the Hellenic Parliament has made some relevant experience with the transformation of law into an Akoma Ntoso-like format through the EU-funded ManyLaws project. Such experience will come handy when designing the new systems and procedures.

In view of the chosen procedure, it must be critically questioned whether other experts would not come to other proposals and alternative ratings at different times. This, of course, cannot be ruled out. Surprisingly, looking at the results, there are no low-rated proposals, even though there was no sorting out of contributions. Ratings will surely change over time and from state to state, also taking the technological progress into consideration. Further workshop rounds with other national parliaments are planned. On the comparative analyses will be reported in the future.

At the end of this first study, the central research questions could be answered. At the same time, new questions emerged. Moreover, each of the 36 proposals should be analyzed in a substantive manner and evaluated with the help of a SWOT analysis. More workshops are planned in 2022 to discuss and further deepen the results. Together, a research and work agenda for the use of AI in legislation has to be developed, embedded in a wider agenda for the use of AI in parliaments. This requires a lively intra and transdisciplinary approach in parliamentary workspace, in which lawyers, legal scholars, legal and administrative informaticians are to be integrated. A roadmap can ensure that the use of AI in legislation can gradually become a reality.

There is interest in the use of AI in legislation and it is important that science and parliamentary practice have set out on the path. This study has helped to frame the general understanding. Proposals are now on the table, in a wide variety, partly in line with expectations, partly surprising. There are many trade-offs to be made between desire and realizability, utility and feasibility, resources and constraints. Certainly, these results are not widely transferable. Using similar workshops, parliaments can work out for themselves whether, where and which AI-based applications are relevant and derive recommendations for politics and the parliamentary practice.

Parliaments that pioneer their engagement with AI and thus build up their own competences can benefit from early insights. The large mass of laggards will have to wait even longer for commercial products in a limited market. Still, a lot of research is required. In the future, legislatures must think and act more decisively about the use of AI in the parliamentary environment and its limits, regulate where necessary and possibly contribute to the design of

own AI-based systems. A first roadmap is now available and there is a lot to do for all those involved.

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