

*Working paper*

## **Prioritisation of Artificial Intelligence Technologies in Law-Making for the Parliamentary Workspace**

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### **Abstract**

Parliaments are currently free to use applications based on artificial intelligence (AI) technologies to perform certain tasks. Those have many manifestations and can be currently found in countless mainstream applications, emphasising relevance and urgency of academic and practical contributions on AI. If one reflects on conceivable tools, fields of application, usage scenarios, and needs, it is reasonable to expect AI-induced changes in parliaments, which are likely to significantly change them over the next decade. This makes even more peculiar the fact that the introduction of AI in parliaments is a generally under-researched topic. This working paper contributes to the bridging of research gaps by presenting empirical evidence for the future use of AI-based tools and services in the parliamentary workspace. In particular, applications of AI in law-making are going to be analysed and discussed. The data were collected in 2021 during a virtual workshop at the Hellenic Parliament in collaboration with the German Zeppelin University. Their analysis sheds light in the prioritisation of AI-based technologies within the parliamentary environment. Prioritisation is therefore important because parliaments as organisations 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.

**Keywords:** Artificial Intelligence, Parliament, Legislation, Digital Twin of Law

### **1. Introduction**

When performing their functions, 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 their users. All this could also happen nearly in real time (Etscheid et al., 2020, pp. 11-12).

At present, there are still only a few concrete visions or conceptions of such a paradigm shift in the parliamentary workspace. There is, therefore, a lack of guiding ideas for the future use of AI in parliaments and, in particular, in legislation. These are important 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 (von Lucke, 2008, pp. 20-21).

If one reflects on potential tools, fields of application, usage scenarios, and requirements, AI-induced changes can also be expected for parliaments. These new approaches will certainly have a disruptive influence over the next decade on the parliamentary operations. In order to deal with these changes at

an early stage and, thus, gain a broad overall view, those who are responsible should examine the corresponding approaches, potentials, and visions for parliaments, especially in the context of the wider legislative process. There can be numerous applications for AI within parliaments. So where to start? Which topics hold particularly attractive added value? Which fields of application can be handled substantially better than others? Which time priorities should be set?

To answer these research questions, a two-step approach was taken: brainstorming exercises and parliamentary workshops. Brainstorming exercises with field experts are a good way to gain an initial overview of the areas and fields of application of AI in parliaments and legislation. In this way, assessments by the relevant stakeholders from the field can be collected, in particular their priorities in terms of content and time. Such an evaluation helps in selecting and classifying the results of the brainstorming. Are the ideas, topics and suggestions generated realistic or unrealistic? Are they relevant or irrelevant? When do the experts think implementation should be done? This preliminary analysis sheds light in the prioritisation of AI-based technologies within the parliamentary environment. Prioritisation is important because parliaments as organisations seem to miss the critical ‘market’ mass, the expertise as well as the funding to develop in parallel several AI-solutions to satisfy all possible needs.

Having such original input on technologies and services, workshops with selected national parliaments are recommended for ratings and comparative analyses. The results can also be used to generate a roadmap for the introduction of AI in national parliaments, created and reflected under scientific supervision. Such a roadmap as a collection of topics, suitable projects, and fields of activity helps parliaments both to raise the profile of their own scientific service and to expand their own pioneering position compared to other peer institutions.

This contribution will attempt to critically and actively engage the parliamentary community in the next stages of this on-going study to collectively shape the future of AI in parliamentary work. Its structure includes a literature review (Section 2) that is followed by a detailed research approach (Section 3). The bulk results of the brainstorming exercise and the parliamentary workshop for law-making are shown in Sections 4 and 5, respectively, and discussed in Section 6. The conclusions are summarised in Section 7, which also offers an outlook of further research actions.

## **2. Literature Review**

According to the prestigious Cambridge dictionary, AI is used to describe the study of how to produce machines that have some of the qualities of the human mind (Cambridge Dictionary, 2022). Behind this, however, is neither a single technology nor a collection of niche applications. Rather, numerous technologies are assigned to AI today (Leslie et al., 2021, pp. 8-12; Zhang et al., 2021). They are now found in numerous mainstream applications, underscoring the relevance and necessity of scientific and practical contributions to AI.

As 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 prioritisation of advanced technologies for parliaments (Koryzis et al., 2021). 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 seems like parliaments and parliamentary assemblies are feeling the societal pressure and begin to respond. This has started with them analysing 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 (Leslie et al., 2021). For the same reason, the Global Parliamentary Network of the Organisation for Economic Co-operation and Development (OECD) established a thematic parliamentary group on AI in 2019 (OECD, 2022).

Parliaments that are well-structured and well-positioned in terms of budgetary resources may be better positioned to respond appropriately to these challenges. For instance, the Parliament of Victoria (2018) in Australia has begun studying them to improve its understanding and plan its digital evolution accordingly. In April 2021, after extensive public consultation, the European Commission (2021) 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 that includes the European Parliament's Scientific Service (2022).

Although several parliaments seem to recognise the need to introduce AI (Inter-Parliamentary Union, 2021), there are so far limited examples of actual implementation in the parliamentary workspace such as in the case of the European Parliament's Archives Unit that developed software solutions to support the analysis of large corpora of archived documents (European Parliament, 2022). In addition, 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 mark up elements (tags) (see, for example, ITTIG-CNR, 2016). Moreover, 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 (Fitsilis, F., 2021). 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 organisation of content, electronic surveys, collecting citizen input throughout the legislative cycle, identifying the needs of parliamentarians during the legislative process, and more (Silva N.F.F. et al., 2021; Souza, E. et al., 2021).

Other existing AI applications include (Inter-Parliamentary Union, 2020):

- The use of chat bots in the Parliament of South Africa to assist Members of Parliament (MPs) with parliamentary information;
- Comparing bills, interpreting references and executing amendment instructions in the United States House of Representatives;
- Automatic reporting in the Dutch House of Representatives;
- Digital media analysis in the National Council of Japan.

When it comes to regulating AI, parliaments can become leading institutions in the application of AI-based tools and services. Due to the complexity of the matter, it is advisable to develop and set up specialised commissions, committees and processes for this purpose (see, for example: Clarke, 2019; Fitsilis, 2021; Fitsilis, 2019). Inevitably, one must also talk about data and data spaces. AI services rely heavily on trustworthy data. In data processing, each data processing cycle requires special attention. In any organisation that handles data, this is closely linked to the recruitment and training of appropriate professionals who deal with data quality and privacy (see, for example: Janssen et al., 2020). In addition, specific processes are required to adequately assess the risks and ethical principles

associated with data governance (Alshahrani et al., 2021; Leslie et al., 2021; Medaglia et al., 2021; Vetrò et al.; 2021).

This exemplary presentation of use cases already shows the dynamics of AI applications around legislation in a relatively narrow parliamentary field of work. However, an expansion of the perspective to the entire parliamentary field of activity suggests itself, because the use of AI can make sense in a variety of parliamentary tasks and requires competences. Many of such solutions could have a direct or indirect impact on legislation, which will be the focus of the further analysis.

### 3. Research Approach

In designing the study, the baseline consideration was which research approach would be best suited to compiling the variety of possible applications for AI in legislation to be able to make an assessment based on it. In addition, it should be noted that AI systems can be technically divided into several branches such as summarisation, classification, sentiment analysis, semantic analysis, and recommendation. Specific technologies and algorithms can be applied differently depending on the case, such as NLP, BERT, and GPT-3. However, as technologies and algorithms evolve rapidly, a technology-agnostic study was recommended. Moreover, the study should not only be about the collection of existing solutions but also about the capturing of ideas for the future AI-based law-making, even if they are not yet technically feasible. 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. They also provide a foundation for impact assessments.

For the open collection of ideas, the brainstorming method invented by Alex Osborn and further developed by Clark (1989) is recommended, in other words a group discussion, in which spontaneous ideas about a particular problem are collected. It was challenging to determine suitable experts to explore the broad possibilities of the use of AI in parliaments in a reflective and design-oriented way. This requires expertise that one must have built up through studies, own research, practical experience, literature research, and professional exchange. Nonetheless, it was possible to bring together a small group of three experts from academia and parliamentary practice who met these requirements. The moderation software XLeap (<https://www.xleap.net>) was used as a cloud-based online variant for brainstorming. The tool has an integrated audio conference, which enables a digital collection of ideas and any desired clustering and sorting. In a first round, ideas for the use of AI technologies in parliaments were collected broadly, openly, and transparently and then sorted. In a second round, a joint review of all contributions, an open reflection, and a complementation were conducted.

A different method is 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 this purpose. Through a systematic decision-preparation and decision-making process, the selection among different, complex solution alternatives is thus made easier (Röthig, 1998). For implementation, an XLeap-based utility survey on relevance and priorities is recommended. For each entry, the relevance of the proposal is requested on a scale from 0 (irrelevant) to 10 (must-have). Furthermore, the priority of implementation is asked on a scale from 0 (2020) to 10 (2030). XLeap provides the corresponding results directly after survey completion and presents them in both a table and a diagram format. This leaves the researchers with the added value tasks of analysis and evaluation of the scores and standard deviations.

Those preliminary results from the brainstorming exercise can be exposed to the parliamentary community for a more detailed assessment. A variety of parliamentary experts would see the

brainstorming insights under the light of their different expertise and knowledge. This perspective for a genuine target group and user survey convinced the team. Rather than having a mixed participation from different parliaments (see Koryzis et al., 2021), administrators and MPs for a single parliament were thought to offer more homogeneous responses. In March 2021, a relevant workshop in Athens with stakeholders from and around the Hellenic Parliament took place. Due to the pandemic, it was not possible for the moderation team to travel to Athens, and XLeap was again used to capture the participants' assessment. All material was translated into Greek. 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 then processed by XLeap and presented to the participants directly after each block vote. The first impressions were briefly discussed.

#### **4. Brainstorming results**

On the basis of the original research concept, the team of experts for the brainstorming exercise was identified, recruited, and invited to a virtual workshop. On 14 July 2020, a four-hour online brainstorming session was organised with the participation of three proven experts. Beforehand, it was difficult to assess whether they would have enough creativity to look far into the future of AI applications in parliament and how diverse the results would be. However, the combination of experts harmonised well and had an enriching effect. The common working language of the participants from Greece and Germany was German. Each new contribution was visible to all other participants via XLeap, thus providing additional inspiration. The general open question was: 'Where are the fields of application for AI in the work and environment of digital parliaments?'

Over four hours of discussion, 196 contributions were collected. During a first screening, duplications were eliminated and their number was reduced to 181. Subsequently, the ideas were clustered into thematic areas: Parliamentary Session (5 contributions); MPs' Offices (7); Legislative Process (30); Digital Twin of Legislation (6); Parliamentary Scrutiny (8); Parliamentary Diplomacy (6); Parliamentary Culture of the Country (5); Civic Education (10); Parliament Buildings (5); Parliamentary Administration (20); Scientific Service (11); Driving Service (3); Parliamentary Police (6); Parliamentary Elections (3); Framework (44); and Open Questions (12).

With an offset of one week, on 21 July 2020, all entries were reviewed, discussed, and partially revised. The final clustering then ensured a consolidation to 210 entries in nine thematic areas: Legislation (36); Parliamentarians (13); 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); and Open Questions (14).

The next sections will be dedicated to the analysis of the thematic field of legislation that consists of AI-based services on the Legislative Process (30) and on Digital Twins of Legislation (6) that can help to further streamline and optimise the legislative process. This cluster is oriented around the parliamentary legislative process, from the draft bill, through the readings in the chambers and the committee sessions, to the promulgation of the law after it has been approved by the MPs. It also includes the tasks of information and documentation on laws.

## 5. National Greek Parliament Assessment Results: Legislation

Eight months after the brainstorming workshop, a virtual workshop was held in Athens on 18 March 2021 with staff and MP advisors from the Hellenic parliament to evaluate the expert's proposals for the first time. There were efforts to mobilise the most representative line-up possible for this workshop. The 14 participants, 9 men and 5 women, originated from seven different parliamentary sectors. MPs and MP's advisors were also invited to represent the demand side of parliament but only a couple of the latter participated. The preparation phase for the workshop lasted two weeks, during which the parliamentary experts were identified, invited, and briefed. Briefings were necessary to clarify various aspects of the study and specific questions on workshop implementation. To save time, a Greek translation of the questionnaire was sent to all workshop participants.

Remote participation was inevitable and the moderation software XLeap was again chosen to facilitate the workshop implementation. A preparatory half hour step was used for onboarding and ensured that all participants were technically connected and broadly aligned with the scope of the event. The workshop itself was moderated in English but predominantly conducted in Greek. Two hours were set aside for the rating of all 210 contributions that emerged from the aforementioned brainstorming exercise. First, the general procedure and the aim of the rating were presented, with the indication that participants would receive the results in the form of an electronic PDF document at the end of the session. Questions to the organisers could be asked throughout the workshop. The participants then individually evaluated all AI-related solutions and approaches for the parliament of the future, each divided into blocks covering the thematic areas. Filling out the questionnaire was anonymous. For reasons of confidentiality but also to prevent participants from influencing each other, a blind procedure was used to ensure that participants could only see their own assessments.

In the evaluation of each of the 210 proposals, one utility value was asked for *relevance* and one for *priority*, so that each participant had to conduct a total of 420 evaluations. 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 broad 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 of which they thought their use were unjustified. The second question was: 'Please rate by priority: implementation'. The deadline for priority or implementation can be set with a year as a date. In this case, the scale ranges over whole values from 0 (2020) to 5 (2025) to 10 (2030). Each of these values can be converted into a concrete date (0: 31.12.2020; 5: 31.12.2025; 10: 31.12.2030). Suggestions that should not even be implemented from the participants' point of view may be rated with the maximum value of 10.

Extensive efforts were made to describe the technical terms and the parameters of the study as precisely as possible. This was necessary because an absolute unambiguity of these terms in German, Greek, English and Spanish (the languages of focus) can actually be ruled out. Table 1 in the Appendix shows the aggregated results of the evaluation of the 36 AI-based legislation proposals made by the 14 workshop participants. Although this is only a small section of the overall results, it evidently offers sufficient material for further in-depth analysis that is conducted in the next section.

In the long run, the experiment should be carried out in the same setup in several parliaments. For this, there was also an observer representing another parliament interested in undertaking this experimental study. However, this participant only took part in the first questionnaire cluster (general part), without influencing the results of the main study.

### 6. Discussion: Findings and Comments

The results of the brainstorming and the evaluation of the participants’ opinion from the environment of the Hellenic Parliament underline a remarkably high interest in AI for future work around legislation. In terms of relevance, all proposals are rated from relevant to essential. The top-6 have received a score of 8.0 and better on a scale from 0 to 10. The cut-off point of 7.5 and better, which is crucial for the relevance scale, contains 19 of 36 proposals (52.7%). The lowest value is 6.07, thus still above a rating of 5 (relevant). Although all standard deviations are above 0.10 for 14 parliamentary practitioners participating, this indicates a divergent assessment, which is, however, kept within manageable limits. There is only one proposal with a notably higher standard deviation of 0.30 (digital twins of law at sub-national level), presumably due to the fact that the national parliament does not have any competence in this.

With regard to the implementation expectations, it can be observed that the participants in March 2021 favoured the years between 2023 and 2026 for the associated implementations. These values are thus within a manageable planning horizon. The maximum value of 10 years (2030) was rarely selected as a target. It is also remarkable that only twice in 36 proposals there are standard deviations of 0.30 and more. The assessments regarding priority are similar.

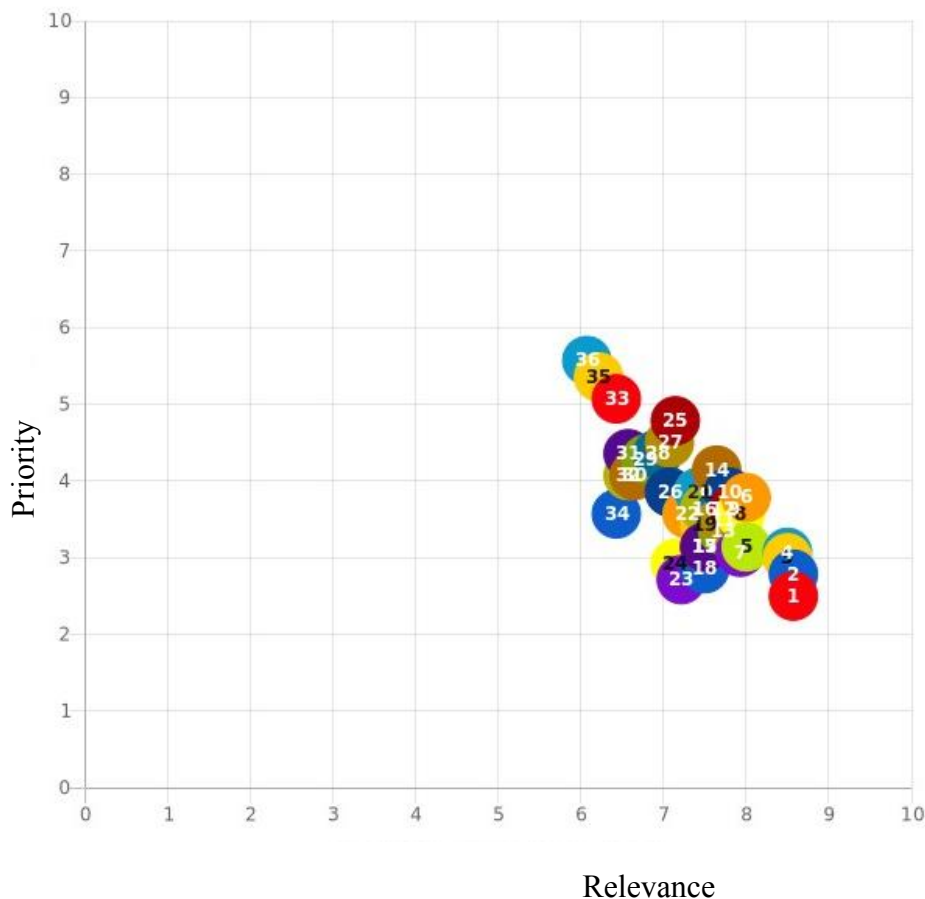


Figure 1. Visualisation of the Results for Legislation.

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 (Figure 1).

In the follow-up to the workshop, all legislation related proposals were developed separately. Of particular interest, however, is the top-6 that is discussed below.

**6.1. *Intelligent examination of legislative proposals for possible impacts with other regulations (Relevance: 8.57; SD: 0.12; Date: 02.07.2023, SD: 0.19)***

AI-based review services can support draft legislation analysis. They can compile all relevant legal regulations and laws that are affected or mentioned by the proposed legislation. Relevant passages can then be presented in a brief report. In a further stage concerning legislative impact assessment, effects on existing statutory regulations and laws could be predicted. In addition, it could be checked whether there are any judicial decisions of further legislative norms (e.g. on the EU level) that oppose the proposed legislation.

There are multiple reasons justifying the high level of enthusiasm for this proposal. Such complex projects are nowadays only possible, if at all, via complex legal information systems and the use of modern document standards such as Akoma Ntoso (<http://www.akomantoso.org>) and semantic web standards. The complexity and the time- and labour-intensive burden of the relevant investigations make ‘intelligent audits’ particularly attractive to parliamentary legal experts and research services. In addition, several participants are members or are familiarised with the work of the Hellenic OCR Team (<https://hellenicocrteam.gr>), a scientific initiative that is already conducting research on several aspects of the ‘Parliament of the Future’.

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

**(Relevance: 8.57; SD: 0.20; Date: 16.10.2023; SD: 0.24)**

Future smart legislation (smart law) requires a machine-comprehensible, electronic legal text (e-code). This text needs to correspond to a 1:1 translation of the current legal text to enable computers to process, interpret, and assess the consequences of the law. Through translation, an AI instance can quickly contribute to the transformation of legislative texts drafted by parliamentarians and adopted by parliament into code that can be understood and ‘consumed’ by computers. Reverse translation can be used to verify that the e-code is fully equivalent to the code. Currently, there are first standards for e-codes such as LegalDocML and LegalRuleML. In the EU legislative process, the European ontology AKN4EU (<https://op.europa.eu/de/web/eu-vocabularies/akn4eu>) has become established.

The Hellenic Parliament has been participating in forward-looking research projects for more than a decade (Fitsilis et al., 2017). In the present context, 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 laws 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 - Collection of all coded laws with the possibility for AI interpretation of the legislation (Relevance: 8.50; SD: 0.13; Date: 31.12.2023; SD: 0.25)***

Future smart legislation (smart law) is based on a collection of electronic legal texts (e-code) that can be understood by machines. Computers are thus enabled to process and interpret laws and to evaluate their effects. Since smart legislation is digital, all legal texts can be made available at any time and be subjected to AI-based analyses. A precondition for such a project is the publication of electronic legislative texts in a standardised format. AI-based analyses, for example with the help of simple text analysis tools or more complicated semantic investigations that reveal legal interactions can help to speed up existing parliamentary investigations (e.g. within the framework of parliamentary scientific services) and draw attention to referencing errors. Such a collection of smart laws thus opens up numerous value-added benefits to intra- and extra-parliamentary stakeholders.



**6.4. AI-based transparency of parliament and parliamentary procedures without the transparency of political bargaining positions of parties and negotiators (Relevance: 8.50; SD: 0.16; Date: 26.01.2024; SD: 0.28)**

With AI-based support, the processes, the status of negotiations, and the arguments exchanged across parliamentary legislative procedures are made comprehensibly visible on the basis of existing documents, speeches, and process chains. This can also include translation into other languages. However, such a transparent analysis of formerly hidden parliamentary workflows does not include the internal political negotiating positions of the parties and negotiators. These should also remain confidential during sessions, if only for tactical reasons. Currently, a transparent overview of the status of political negotiations is not attempted as its preparation can be a complex task. An AI-based visualisation could provide a lot of benefits.

Transparency is one of the core values of the Hellenic Parliament and takes on a central position in its latest strategic plan 2018-2021 (Hellenic Parliament, 2018). 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, it comes as no surprise that 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.

**6.5. AI-based substantive review of contributions from associations, stakeholders, and lobbyists (Relevance: 8.00; SD: 0.14; Date: 20.02.2024; SD: 0.20)**

Contributions from associations, stakeholders, and other lobbyists could be analysed by AI-based tools to determine whether they meet the Parliament's minimum requirements for comments and further consideration. If relevant content such as contact details, recommendations, and other items are missing, the sender could be promptly alerted and asked to amend the submitted material. The parliamentary administration may also benefit from such an analysis if, as a result, it comprehensibly records and sorts the arguments of the contributions and bundles identical argumentation patterns. For this purpose, AI-based metadata can be generated and added to the respective contributions. In this case, too, the additional benefit is the reason for the high rating. The current procedure is blue collar labour-intensive and AI support would bring substantial relief for the staff in parliament.

A significant part of the workshop participants, 30.8 % or 4 out of 13 (parliamentary journalist, administrator to Special Permanent Committees and two associates to Members of Parliament), belong to administrative units or constitute parliamentary actors that directly interact with external stakeholders. Some of their main responsibilities relate to the exchange of usually pre-defined structured information and data necessary for upcoming parliamentary work and the ex-post summarisation of the main points and arguments of parliamentary hearings, debates or, in the case of the Hellenic Parliament TV, interviews. AI-based tools would assist them by filtering information prior to any debate, thus enhancing the level of political discourse. Moreover, advanced text analytics in the form of summarisation, sentiment or content analysis could speed up the evaluation of the outcome of parliamentary procedures.

**6.6. Many digital twins of municipal legislative situations (Relevance: 8.00; SD: 0.22; Date: 16.10.2024; SD: 0.20)**

Digital twins of law are future core elements of smart law. They ensure that law can be transferred into machine-understandable e-code. The 1:1 equivalence between legal documents and e-code is what makes computers able to process and interpret laws and evaluate their effects. As a result of local self-government and the statutes passed by the municipalities, the regulatory environment might be slightly different in every municipality or even entirely divergent in case of a federal scheme. The

necessity of such digital twins at the municipal level becomes apparent when one is aware of the diversity and complexity of municipal statutes and their application. A long-term goal can therefore be the creation of several digital twins for the same legal situation in each municipality. Municipalities currently have no competence to set up such digital twins.

While the notion of ‘digital twin’ is a tempting one, apart from the pertinent literature, administrators in the Hellenic Parliament have had no opportunity to interact with such a concept. In the municipalities, the familiarisation with such technology and the acknowledgement of its potentially ground-breaking effects should be even lower. However, on the parliamentary level, stakeholders were able to recognise the usefulness of digital twins for the local self-government placing the relevant option remarkably high, in other words sixth out of 36 in the relevance ranking.

## 7. Conclusion and Outlook

With a creative research approach, a flexible brainstorming team and an innovative parliamentary environment, 36 constructive proposals for the future use of AI to improve legislation were gathered and evaluated by Hellenic Parliament experts in 2021 with a view to relevance and priority. The generated list contains several proposals that should be considered for implementation in the coming years, when AI technologies in the parliamentary environment and digital twins of law become more mature and commercialised. 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 and law-making process. Moreover, it can be derived that certain activities in the area of basic research must now be initiated so that digital twins of law can be implemented in the medium term and AI-based solutions based on them can be realised. Likewise, guiding images, ethical aspects, regulatory requirements, and guidelines must not be disregarded. Unfortunately, the use of AI in the legislature can also have extremely negative consequences, up to undesired but fatal consequences as a result of a bad AI-designed law, which can be anticipated and limited.

The six options prioritised by workshop participants and discussed in this working paper constitute the ‘tip of the iceberg’ of the 36 AI-based apps and services linked to the different facets of 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 a series of implications in two fronts:

1. When updating the parliament’s strategy plan – The next four-year strategic plan can entail a digital component, as well as an action plan with the necessary action items to implement it. 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.
2. When planning for the organisation’s next generation ICT systems – Here the transformation of legislation into machine consumable e-code needs to be structurally embedded into or facilitated by any updated or procured legal informatics system. As discussed above, the Hellenic Parliament has made some relevant experience with the transformation of law into an Akoma Ntoso-based format through the EU-funded ManyLaws program. This experience will come handy when designing new systems and procedures.

In view of the chosen workshop implementation procedure, it must be critically questioned whether

other experts would not come to other proposals and other ratings at other times. This cannot be ruled out. Surprisingly there are no low-rated proposals in the results, even though there was no rigid sorting out of contributions. Time, technological progress and institutional maturity will surely affect ratings. For this reason, further workshop rounds with national parliaments worldwide are planned. On the resulting 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 and still open questions have arisen that need to be tackled in the coming years. Each of the 36 proposals should be elaborated upon in a substantive manner and evaluated with the help of a SWOT analysis. A critical reflection in advance is important because the additional benefits, limits, and risks of the use of AI in legislation have hardly been understood so far. In one of the proposals, for instance, there is an explicit reference to the required discussion on the necessary ethical framework. Ultimately, it remains to be seen how the results will be received by the parliamentary community. Together, a research and collaboration agenda for the use of AI in legislation needs to be developed, embedded in a wider agenda for the study of AI in parliaments. This requires a lively intra- and transdisciplinary approach, in which legists, legal scholars, legal informaticists and administrative informaticists are to be integrated.

The approach and the analysis have been valuable. It is important that science and parliamentary practice have set out on the path and that there is true interest in the use of AI in legislation. This study has helped to make it clearer and easier to understand what specifically needs to be talked about when considering such as evolutionary step for the parliamentary workspace. Certainly, these are issues that are in part still far away from the current reality in parliaments. Yet, proposals are now on the table, in a wide variety, partly in line with expectations, partly surprising. In the assessments, there are many trade-offs between desire and realisability, utility and feasibility, resources and real constraints. The shown research results are not widely transferable. With an assessment workshop, parliaments can work out for themselves whether, where, and which AI-based applications are relevant for their case and derive recommendations for action regarding both politics and the parliamentary practice.

Overall, parliaments that engage with AI at this early stage and thus build up their own competences can benefit from their early insights, prototypes, initial solutions, and implementations. The large mass of laggards will have to wait even longer for commercial products in a limited market. In the context of AI and parliaments, a lot of research is therefore still required. In the future, legislatures and academia must talk much more intensively about the use of AI in the parliamentary environment, discuss controversially about its limits, regulate where necessary, and design it by themselves. A first roadmap is now available. It also remains open whether some of the mentioned AI-based projects can be implemented at all or must be classified as unsolvable ones. One thing is sure: there is still a lot to do for all those involved.

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## Appendix

Table 1. Multi-Criteria Table for Legislation. Sorted by Relevance.

Nr	Item	Relevance 0..10		Priority 31.12.20- 31.12.30	
		↓Ø	SD	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 - Collection of all coded laws with the possibility for AI interpretation of the legislation	8,50	0,13	31.12.2023	0,25
4	AI-based transparency of parliament and parliamentary procedures without the transparency of political bargaining positions of parties and negotiators	8,50	0,16	26.01.2024	0,28
5	AI-based substantive review of contributions from associations, stakeholders, and lobbyists	8,00	0,14	20.02.2024	0,20
6	Many digital twins of municipal legislative situations	8,00	0,22	16.10.2024	0,20
7	AI-based review of comments from academia and society	7,93	0,18	26.01.2024	0,21
8	AI-based gender-sensitive analysis of texts with suggestions for improvement (Gender-sensitive analysis through AI)	7,93	0,25	27.07.2024	0,28
9	AI-based recommendations on legislation based on identified gaps in legislation, identified issues, and other relevant acts	7,86	0,17	22.08.2024	0,23
10	Automated review of a bill's digital fitness (looking at digital processes and later digital twin)	7,79	0,24	10.11.2024	0,29
11	Digital twin of the legislative situation of the federal government, all states & regions and all cities	7,71	0,22	02.07.2024	0,19
12	AI-based forecasting of long-term impacts from legislation	7,71	0,22	22.08.2024	0,23
13	AI-based creation of texts and drafts based on parameters	7,71	0,23	12.05.2024	0,25
14	AI system for prospective legislative impact assessment and consequential impact analysis, accompanying legislative impact assessment, and subsequent legislative impact assessment	7,64	0,22	21.02.2025	0,20
15	AI-based legislative drafting systems based on prefabricated text modules for manual further processing	7,50	0,18	20.02.2024	0,27
16	AI-based tips and recommendations on literature on current legislative projects	7,50	0,22	22.08.2024	0,27

17	Digital twin of federal/national legislation	7,50	0,23	20.02.2024	0,20
18	AI-based forecasting of economic consequences of laws and decisions	7,50	0,24	10.11.2023	0,20
19	AI-based voting monitoring as a means against voting fraud by parliamentarians or against influence of foreign powers (IT sabotage, IT fraud, hacking)	7,50	0,26	06.06.2024	0,27
20	AI in public consultation processes to deal with diverse comments (AI in Public Consultation Processes), to speed up the processing of comments, and to sort proposals (Topic Modeling)	7,43	0,18	10.11.2024	0,21
21	AI-based risk management systems to identify needs for action	7,43	0,22	10.11.2024	0,20
22	Automatic reporting!→AI-based argumentation and text generation	7,29	0,14	27.07.2024	0,22
23	AI-based detection of legislative needs, regulatory needs, and gaps in laws & regulations	7,21	0,24	16.09.2023	0,21
24	Impact-based legislation: intelligent analysis of which legislative changes are needed to achieve intended impact	7,14	0,24	06.12.2023	0,19
25	AI-enabled eLegislation - From the cradle to the grave of a bill	7,14	0,25	15.10.2025	0,30
26	Artificial intelligence framework/guide/vision for legislation (living legislation)	7,07	0,17	10.11.2024	0,26
27	AI-based recommendations on legislative negotiations	7,07	0,23	01.07.2025	0,24
28	New AI-based capabilities for reliable integration of direct democratic elements	6,93	0,27	11.05.2025	0,28
29	Rule-based supporting systems in legislative drafting by parliamentarians	6,79	0,23	15.04.2025	0,20
30	Reliable decision-making systems, ensured also by AI services	6,64	0,22	26.01.2025	0,27
31	AI-based assessments and forecasts for public support of projects	6,57	0,24	11.05.2025	0,27
32	Interest-adequate transparency	6,57	0,26	26.01.2025	0,25
33	Legislative footprint with AI-based visualization of stakeholders	6,43	0,28	25.01.2026	0,33
34	Digital twin of a state's/province's legislative situation	6,43	0,30	27.07.2024	0,18
35	AI-based highlighting of political positions and negotiating leeway	6,21	0,26	11.05.2026	0,24
36	AI-based forecasts on the success of certain negotiation patterns and negotiation paths	6,07	0,19	27.07.2026	0,20