



Time to Legislate

A Database to Analyse the Temporal Dynamics of the German Legislature

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Abstract. What are the temporal features of the German legislature? How quickly do lawmakers act and how fast is the acceleration of policy-making processes? To this day political science has not succeeded in analysing these time-related questions concerning the legislature and the time-strategic actions of political actors comprehensively and quantitatively. So far a vast, ample database comprising said information does not exist. Such a lack seems surprising as time as a resource in policy-making is extraordinarily relevant and the collection of necessary information on the German legislature is at least technologically possible today.

This paper therefore puts its scientific focus on above-mentioned methodological challenges. It points out how important temporality is to the research on decision-making processes and it presents a database which will list every single procedural step within any given legislative process. The foundation for all raw data is formed by the entire body of indexes of legislative material, issued and published by the Parliamentary Archives of the German Bundestag for every law respectively. All requested pieces of information are obtained by the means of a computer-assisted read-out. Thereby and for the first time, research on the temporal dimensions of policy-making – its duration, pace and acceleration – will become adequately accessible to analysis.

Keywords: Temporality · Legislation · Data-Wrangling

1 Introduction

“Of all the things that are powerful in constraining the choice set, in shaping the way we think, time and the way learning is embodied in history are certainly among the most powerful. ... I will be blunt: Without a deep understanding of time, you will be lousy political scientists, because time is the dimension in which ideas and institutions and beliefs evolve” [1, p. 361].

Rome wasn't built in a day. This proverbial phrase holds for various aspects of life. Moreover, it seems relevant when speaking of policy goals and their implementation: Time is often regarded as an indicator for the quality of democratic decision-making or the efficiency of policy-making [2–6]. Acceleration of decision-making, a break-neck pace of legislation or a short duration of the processes of law-making are seen to dilute the legitimacy and to deteriorate quality of any political decision. Episodes of high law-

making density [6] are associated with the parliament's dwindling power of participation, resulting in a lack of parliamentary oversight [4]. In contrast, long duration of policy-making is also seen as an expression of inefficiency [7]. Usually, two reasons for taking (too) little time are given: 1. Desynchronisation of political and societal systems makes it mandatory that the legislative power reacts to exogenous stimuli of adaptation. Hence, it adapts its reaction time in order to live up to its aspiration as an actively creating force. 2. To enforce their policy goals, political actors influence political processes by using time strategically. Hereby time serves a double purpose as instrument of power and as resource [5, 8–10].

Obviously, the temporal component of policy-making is of scientific and societal relevance. Yet in both, theoretical discussion and empirical examination, the reasons for temporal patterns in legislation, the impact of temporal rules and the significance of intentionally time-related actions in legislation have been neglected [3, 11]. At least for Germany, this is essentially explained by the lack of a database which could provide a broad foundation upon which to rest comprehensive, quantitative analysis. The paper at hand introduces such a database. In the following, the necessity of this tool will be explained by elaborating on the state of the art regarding temporal analysis in political sciences. The three temporal components of legislation will be outlined: duration, pace and acceleration, as will be the resulting challenges for political sciences research. Subsequently, the data-wrangling process achieving the database will be described. The paper will conclude with suggestions for future research.

2 Temporality as a Subject of Political Science

Institutionalised temporal rules define time-measures, which sequence political events (like law-making processes). These rules constitute political proper time, in other words they constitute the rhythm for policy-making [12]. Political proper time is defined as all temporal patterns and structures of the political decision-making process, or more precisely, it involves all sequences of decision-making which result in collectively binding decisions [11]. This polity-dimension contains the central democratic time unit: the election period of parliament and government [7]. Its key role is highlighted by the fact that all political actors plan their activities along this limiting time frame – organised in yearly session calendars including e.g. sessions weeks and vacations –, even more so in Germany as legislative initiatives are subject to discontinuity. Discontinuity means that the legislative process of all bills ends with the election period of parliament. Furthermore, pertaining to this polity-dimension are any temporal rules derived from the German Grundgesetz or the law-making bodies standing orders. These rules define the chronological procedure of passing a bill (such as the number of plenary sessions or the order of sessions) and the way in which time resources are allocated between actors (such as speaking time or deadlines).

To elucidate the question as to how election periods influence policy-making, there is empirical evidence that political actors are likely to propose highly controversial bills at the start of a legislative period [6]. Other findings also show that policy goals which enjoy broad approval among a coalition tend to be prioritised with regard to their timing: “the policy agenda produced by coalition governments appears to be organized

in a fashion that accommodates the policy goals of [the cabinet as a whole]" [13, p. 457]. These two observations do not contradict each other, but illustrate the fact that temporal rules create (temporal) space in the politics-dimension which can be characterised as contested space [11, 14].

Political processes (the politics-dimension) serve as platforms for arguments over the interpretational superiority imposed on past events as well as the shaping of future events. Here political actors apply those temporal strategies which, based on their expectation, will be successful in implementing their goals. How flexibly temporal leeway can be used and how great any political manoeuvring room is, depend, not least, on the grade of detail with which political proper time is institutionalised. The above-mentioned temporal strategies become visible in legislatures and thus, these strategies gain remarkable societal relevance.

Any German legislative process is temporally structured, but multiple loopholes for political actors still remain in order to utilise temporal space and leeway as instruments of power in accomplishing their agendas [8]. Political science has come up with differing assessments of politicians' possibilities of strategic temporal actions. Some say that political actors have little possibilities to shape legislative temporality, because the institutional time-order define high functional responsibilities for upholding the legislative process which actors could hardly influence [6]. This structural burden relates to the fact that productive legislative processes can only be guaranteed when law-making actors abide responsibly to the overarching schedule of advancing a bill and finally passing it [6]. Contrary to this argument the temporality of legislative processes (their duration, pace and acceleration) can vary enormously. This dissents from the idea of narrowly confined manoeuvring room. Political actors act very well within these institutionalised schedules to either slow down or accelerate political processes: "politicians had to learn how to manipulate time, ... into something that could be scheduled, anticipated, delayed, accelerated, ... and even wasted – but never ignored" [15, p. 71]. Furthermore, federal law provides politicians with a legislative fast lane for example when focusing events, crises or any state of emergency occur [16]. In those cases it is less the crisis shaping the temporality of legislature, but the political actors' preferences for example to follow their (potential) voters' demands [8, 17]. But political actors can open fast lanes also due to other reasons like the end of the legislative period.

Moreover, particularly parliamentary government factions in the German Bundestag hold immense sway over the temporal order of the parliament's agenda. Decisions on the parliamentary agenda taken in the parliamentary advisory committee will by tradition be made unanimously or at least with the support of an overwhelming majority, but under no illusion the parliamentary agenda could be changed by a vote of simple majority, for example by the government factions, at any time [18].

Lastly, with regard to the policy-dimension temporality refers to concrete time horizons of policies. This includes the duration of validity of any political decision: at which point in time will they come into force, (when) will they have to be evaluated, and how long will they stay in power? Questions about policy-timing also belong to this dimension [8].

Empirical research on temporal intricacies of policy-making has so far merely dealt with some individual aspects. This implies studies on the relation between the timing of

a legislative initiative and the duration of the law-making process of (contested) policies [3, 8, 13]. The acceleration of legislation as a reaction to an accelerated environment is subject of political science research, too [5, 10, 19, 20]. Particularly for the German case most work is done regarding the influence of decision-making within a federal state on the duration of legislation [21–25]. Additionally, there is research on the reasons why a particular bill might be successful or not. Temporal aspects of policy-making are thereby either explicitly or implicitly considered contemplated against the backdrop of success factors – from the perspectives of institutions, partisan strategies or party programmes [26–28]. In all of these studies the complexity of a bill is rarely considered as a reason for its temporal characteristics. But this is of importance to conceptualise pace as one legislative temporal component. Moreover, political science lacks an analysis which puts the explanation of temporal patterns in decision-making at its centre. Additionally, as far as these studies try to answer questions regarding the temporal dynamics quantitatively, they lack an exact database: “For example, such a study might involve an analysis of the number of committees to which a bill is referred ..., the number of hearings scheduled, the number of expert witnesses invited to testify. At the moment, such data are not available in systematic fashion” [4, p. 17].

Hence authors circumvent this void by citing the duration of legislation, since valid data on the point in time when the bill was initiated and its final passage is available. This is in Germany thanks to the Dokumentations- und Informationssystem für Parlamentarische Vorgänge (DIP) (an information-system on all parliamentary proceedings of the German Bundestag). However, the duration is inadequate to answer most of the temporal questions. For example, a longer duration of legislation might coincide with extensive consultations, numerous committee meetings, public hearings or the appeal of a mediation committee. Yet only the number and type of actions truly allow insight into the extent of parliamentary revision. Similar problems emerge during the analysis of acceleration of policy-making. Those studies show that the nuances of temporal actions are hardly accessible methods of quantitative research as long as we do not have an adequate database [11].

3 Temporality of Legislation

The course of legislation and its associated formal temporal rules are defined by the German Grundgesetz, the Joint Rules of Procedure of the Federal Ministries (GGO), the Rules of Procedure of the German Bundestag, as well as the Rules of the Mediation Committee and of the Bundesrat. As Fig. 1 shows in Germany Federal Government, Bundestag and Bundesrat have the right to initiate bills. These constitutional bodies can therefore declare the formal temporal starting point (the policy-timing) of a bill. More detailed and delicate fine-tuning of any bill will be done in the respective specialised committees of Bundestag and Bundesrat. The type and total number of committees involved are contingent on the subject matter. The committees’ work is flanked by plenary sessions in Bundestag and Bundesrat. Usually, a bill is formally read three times in the Bundestag’s plenary sessions and can be discussed (up to) two times in the Bundesrat’s plenary sessions. Yet this does not include possible further plenary

decisions which follow a mediation procedure. After passing a bill, the federal government will sign it, the head of state will promulgate it and it will become written law after having been published in the Federal Law Gazette.

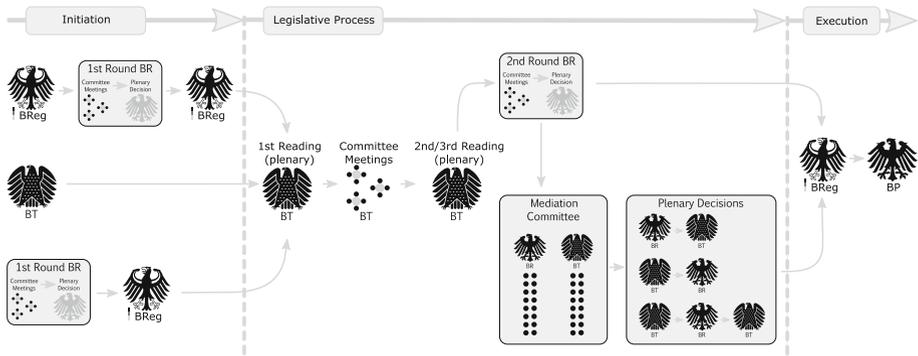


Fig. 1. German legislative process; abbreviations: BReg = Bundesregierung (Federal Government), BT = Deutscher Bundestag (German Federal Parliament), BR = Bundesrat (German Federal Council), BP = Bundespräsident (Federal President)

In the years 1990 to 2009, 2592 laws have been promulgated and published. Depending on their complexity, cross-party consensus, public attention or urgency each bill's legislative run can differ immensely, ranging from three to exceeding 1300 days [8].

Why was existing quantitative data insufficient to analyse the temporality of legislation? Existing data can merely and this only partly lead to conclusions on the duration of legislation, but they cannot lead to comprehensive conclusions on pace and acceleration, whereas the scientific discussion is reasonably focusing around causes and effects of pace and acceleration of policy-making [2, 5, 6, 10–12, 20, 29]:

The duration of law-making indicates how much time will have passed from the start to the end of any political process [29]. Defining the start of a legislative process, however, is not always self-evident when various propositions are discussed simultaneously. The starting point of a policy is formally determined by the fact that ordinarily one of the simultaneously discussed propositions poses as the so-called basis of the law-decision. As a premise, statistical data of the German Bundestag always rest on the starting point of the bill which has formally and finally been declared as the basis of the law-decision. Every other meeting concerning the other propositions of similar content is not considered, since they, from a formal standpoint, are viewed as propositions in their own right. In some cases, this analytical blind spot might distort the actual duration of a policy becoming law. Initiatives from the Bundestag for example do not require a so-called first round (erster Durchgang) in the Bundesrat, but for initiatives of the Bundesregierung it is mandatory. At times federal government and parliamentary government factions introduce identical versions of a particular bill at nearly the same point in time. This can cut short legislative processes, which affects their duration. If it is the aim to analyse temporal idiosyncrasies of policy-making, then the process and

time resources utilised need to be looked at in their entirety. At least, a comparison is required which sheds light on how strongly certain periods of legislative process can differ, when not purely examining the formal course of a bill, but also studying its progression with regard to content.

Considering duration alone will not suffice to make claims about the temporality of legislation. Duration is a descriptive measure for the temporal action arena of each legislative process. It might be short or long or something in between. In principal, a long legislative duration might open up room for manoeuvre, but how does this pay out in reality? The temporal length of law-making actions thus holds only limited explanatory power, as long as it remained unidentified how many and which kinds of legislative steps were undertaken throughout a certain period of time. Whereas, if the duration of a law-making process is combined with the complexity of a bill as well as with the number and types of events (for example the number of committee meetings), this will bring light into the pace of legislation: A process with a long duration and few events is slow, with many events but few decisions (e.g. numerous adjournments of a bill during committee sessions) is not faster nor does it indicate, for example, any parliamentary control over government bills. Low priority of a bill could also account for its prolonged stay in the legislative treadmill. Thus, not only the number (which exposes how many times political actors have handled the issue at hand) of events have to be counted, but their results have to be weighted (e.g. decisions made). Therefore, it is crucial for any analysis of law-making pace to include each of these procedural steps.

The number and type of action have to be assessed in relation to each bills' complexity. Quantitative research has largely neglected the complexity of legislative bills. There are only few exceptions: Borghetto 2014 operationalises (inadequately) complexity by the length of legislative text [3]. And the so-called key decisions recognised by Beyme 1997 can be complex laws. But not all complex laws are key decisions. Key decisions are instead decisions of greater innovative potential and broader societal and political impact [30]. Yet the paper at hand argues that complexity regarding legislative proposals has a factual, an institutional, a political and a societal dimension. Law-making inherent variables for those dimensions are *inter alia* the following: The number of committees and related policy fields are variables for the factual dimension; so called consent or objection bill and required majorities for the institutional dimension. Party majorities in Bundesrat and Bundestag as well as a mediation procedure are variables for the political dimension; expert hearings and statements for the societal dimension.

Thus, defining the pace of legislation is by no means trivial. Unlike in the case of a car ride, the quality of the task varies. The physical unit of speed is based on a perennial task, covering spatiotemporal distance, measured, for example, in kilometres. Passing a law, on the contrary, calls for bridging a content-related distance. This distance will differ for each bill. The pace of legislation will therefore be deduced from 1. the complexity of a bill, 2. the number and types of processual steps undergone and 3. the duration of the legislative procedure.

The acceleration of policy-making is relevant because the pace within a particular policy can vary, as well as it is being volatile when comparing different policies: "Many political processes exhibit changing tempos: They speed up and slow down at given points." [29, p. 1288] Regardless of whether acceleration within a certain policy

or for every bill during a legislative period would be identified, firstly one would have to determine the inherent pace of a political unit of interest (for example a legislative process or a specific facet such as the second hearing in the Bundesrat). This has not been done yet. In addition, the term acceleration is often used imprecisely [10]. In common jargon, acceleration is understood as an increase in pace or speed, and this understanding has also been adopted in social sciences. Acceleration is volume increase per time unit, it is said [5]. But it can either be greater than zero or below zero (which would commonly be referred to as slowing down). Yet acceleration has to be defined as the measure of the change rate of pace. Even though these challenges are obvious, acceleration of political action is currently the temporal category primarily addressed in political science research. Sociological findings on the challenges imposed by societal and technological transitions are tied to answer the following questions: In which way should politicians act in an ever hastening world of an asynchrony between environment and system? How far can political systems gain time to make essential decisions? How should democratic political systems organise deliberative decision-making under these conditions [5]?

4 Description of the Database

The so-called *Parlamentsdokumentation* of the German Bundestag maintains a database on all bills initiated. Their Documentation and Information System (DIP) hereby provides access to the public part of these legislative material, like the legislative text or plenary session records. These legislative material form an indispensable basis of legislative transparency and they inform about main law-making issues and related temporal aspects. The raw data has partly been made available for research work already. Meanwhile, the data of the 16th, 17th and 18th legislative period can be retrieved in XML format via a static HTML page in machine-readable format. This data can be exported. Yet the information contained in this database is far from sufficient for the analysis of duration, tempo and acceleration of legislation: Firstly, the DIP documents legislative processes only for one concrete submission at a time. Secondly, the DIP solely notes a few selected actions of the whole legislative processes, such as the date of entry into the Bundestag or Bundesrat or the date of plenary sessions. These events are central events that take place in every legislative process. In addition to these mandatory acts, the DIP documents when a mediation committee has met and whether a public hearing took place. The DIP does, however, not list every single law-making step.

For these reasons, a machine-readable database is needed that lists any distinct event occurring within a legislation and which contains information providing insights on the complexity of any negotiated bill. The legislative database presented below closes this gap by using the textual information of the parliamentary archives of the German Bundestag. These archives document almost every legislative step and store any document belonging to said workflow. Moreover, they record which bills (of same content) were discussed together. Thus, the legislative material of the parliamentary archives is the most comprehensive documentation available on federal legislation, published in the form of hard copies accompanied by content overviews (indices)

together with each hard copy. The content overviews are accessible online as PDF files. The database extracts – computer-aided – the desired data on legislative processes from these content overviews (which are currently obtainable from the 8th legislative period onward). Nevertheless, a few gaps remain: meeting dates of the defence committee, for example, are not disclosed and therefore not properly listed. Similarly, works of sub-committees which are only occasionally installed are not fully documented. In addition, an allocation of the exact subject-field, for example via so-called finding aids (Fundstellennachweis, FNA) or via the subject-scheme of the GESTA (Stand der Gesetzgebung des Bundes) is excluded from the parliamentary archives’ overviews. Fortunately, Juris GmbH has made the FNA and GESTA numbers available for integration into the database. Currently the database contains all legislations between 1990 and 2009 (12th to 16th election period).

4.1 Technical Workflow

All content overviews are provided in PDF format. Unfortunately, these documents have been varying over time with regard to their layout and spacing. For further processing it is essential to translate these documents into a structured representations. An overview of the technical workflow for the extraction of the data is shown in Fig. 2 and explained in subsequent sections.

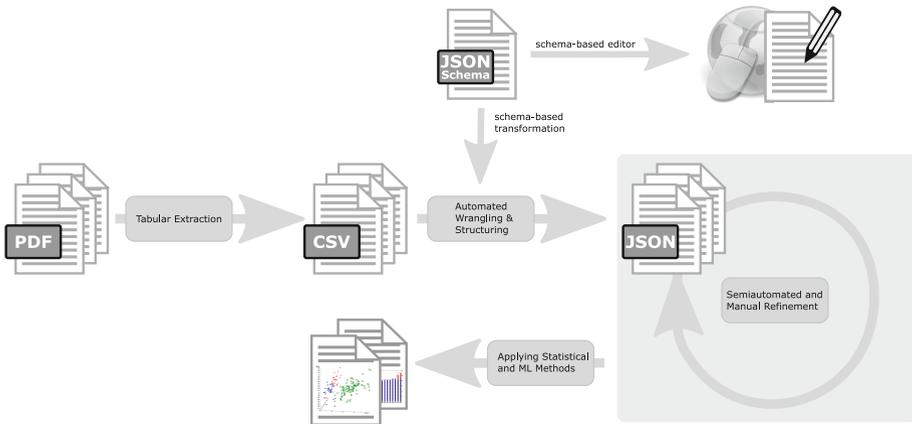


Fig. 2. Data-Wrangling-Process to setup the database

4.2 Schema Definition and Editor

The content overviews consistently contain the same type of information: title, diverse identification numbers, the committees involved, a listing of the legislative material which informs about every single law-making step and date (grouped by general phases and once more sorted by working steps within each of those groupings) as well as additional material such as press or official statements. All content is ordered – by consecutive numbers – along the temporal logic of its respective law-making process.

This logic can be formalised by a schema-language that captures document structures and types of content. Thus, the content overviews can be exchanged and interpreted by machines.

Recently, the JSON format became the de facto standard beside XML format for sharing structured machine-readable data. Even though XML is considered to be human-readable, JSON is more concise and easier to work with. Therefore a JSON schema is used (instead of the better known XML schema definition XSD) to assert a consistent definition of the structure and type of data given in the content overviews. Through this JSON schema it is possible to generate a form-based editor which handles the documents in the database besides using existing text-based JSON editors. The former one ensures that any user is only able to craft syntactically valid documents; the latter gives hints when users violate the JSON schema during editing. Experienced users are more time efficient when working with the text-based editor. This is of importance, because the generated machine-readable data have to undergo a manual reassessment process. But both editors are not intended to translate the above-mentioned PDF documents manually (and from scratch) to a schema-conform JSON document. Instead, an automated approach that is at least partially capable to derive these documents from their sources may save copious amounts of time and is therefore the only economically reasonable option when building an extensive database. Thus, there is an obvious need for the original PDF documents to be automatically transformed.

A number of algorithms exist which learn layout and spacing parameters in order to extract tabular representations from documents and return these for example in CSV format. For the database a cloud-based service (pdftables.com) was used. It applied such an algorithm to the overviews of legislative procedures in PDF format. By using this service all content overviews from 1990 to 2009 were transformed from PDF to CSV. Newer ones have not completely been archived as of now, while older ones hit the algorithmic limitations due to the bad quality of the scans.

4.3 Automatic Post-Processing and Transformation

Even though the above-mentioned automated extraction generates reasonable results, variations in the tabular representations occur due to errors such as incorrectly identified alignments or rows. To cope with these issues, a further processing step has been implemented that rectifies known difficulties of the parsing process. This increases robustness regarding the mapping of detected elements with respect to the JSON schema. The general procedure here is to separate the concerns of extracting (1) the general information of the legislative process dealt with, (2) the committees and (3) the law-making material, which are sorted by consecutive numbers. The content overviews are subdivided into sections and embeddings of sections based on rules determined by row size and specific regular expressions that indicate an end or a new start of such a section. Within a section regular expressions are applied to extract information associated to a given concern. They are defined in such a way that they capture all common variations that may occur with respect to column-size variations, to filter irrelevant parts from relevant ones and to deal with variations in notation or occurring typos

(some of them may be captured, others may be not syntactically distinguished and need a manual, contextual and semantic rectification).

Internally, the resulting JSON structure is successively built up while extracting the information of interest. Hereby, the law-making material is the most difficult part of the document. Here we find an order that follows the responsible institution (like Bundestag, Bundesrat). All responsible institutions have to be identified correctly. All consecutive numbers have to be correlated with the right institution. Moreover, additional entries (like enclosures) which do not have their own number but do relate to a consecutive number have to be assigned. All lines that are hereby not handled are written to the error output of the process in order to serve for manual monitoring and debugging purposes.

4.4 Semi-Automated and Manual Refinement Cycle

The obtained schema-conform documents can be refined regarding errors in the original documents, issues that occurred due to transformation (where some of these sort be inevitable to decide on syntactical level and therefore requires contextual embedding or semantical relation for decision).

The above-mentioned refinement process makes use of the generated web-based editors. Further, it incorporates a version control system which keeps track of contributions made for example by different individuals. By doing so it is assured that each contribution may be reviewed by another person and changes can be rejected or reverted at any time, if required.

5 An Appeal for Future Research

Democratic participation and the inclusion of interests have always been the pillars of a flourishing democracy. As the centrepiece of German policy-making the federal government, Bundestag and Bundesrat, have come under increased scrutiny over the past years. Legislation was too fast or too slow, the criticism went. The acceleration of policy-making to cope with an accelerated environment decreases the influence of parliament (the so-called Entparlamentarisierung) is said on the one hand [5, 10, 19, 20]. On the other hand, it is complained that political actors are not able to give efficient answers to urgent problems. Frustration and declining political interest seem to be the results of this. But little attention – at least quantitatively – has been paid to the question what exactly can be said about the temporal aspects of policy-making aside from subjective perceptions which are dependent on one's own position and interests. What is the quantitative evidence for the above-mentioned sentiments?

The described database lays the groundwork for the examination of the legislative process and its temporal patterns and oddities. It contains the necessary information to answer temporal questions on law-making: What exactly is the duration, pace and acceleration of law-making? What are, for instance, causes that are inherent to the law-making process for a slow or fast pace [31]?

Here, the number of actions, the complexity of the bill, public hearings or the subject field might be reasons for a change of pace. The database is a device to address

these questions: Its structured content can be used in order to build variables of interest or to aggregate information. Further methods of analysis of an arbitrary type can be applied such as basic statistics, methods for statistical inference or even more advanced ML methods which may learn complex structures or patterns. Additionally, the data as well as the results of the analysis can be visualised to give additional, intuitive insights from the available data and to shed some light on temporal patterns of the law-making process. Thus the database proves to be a beneficial tool to enable critical analysis and versatile research on the many proverbial pulses of politics.

It really is about time.

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