

IT-supported Optimization Potentials in the Identification of Needs for Action in Companies through Legislative Changes

Bachelor Thesis - Final

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Technische Universität München

www.matthes.in.tum.de

Motivation

Research Questions & Approach

Results

Information Publishing

Information Retrieval

Optimization Potentials

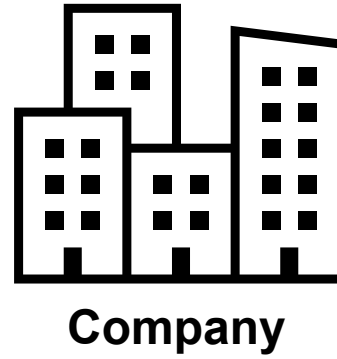
Conception of an Improved System

Conclusion and Future Work



Legislative Change

- Federal Law
- Regulation
- Directive
- ...



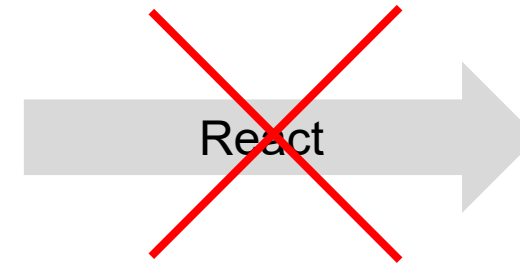
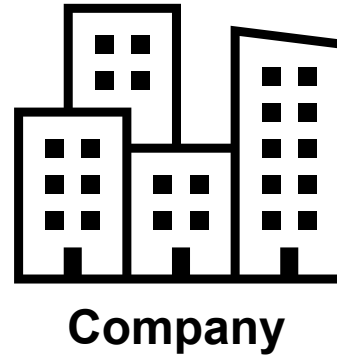
React





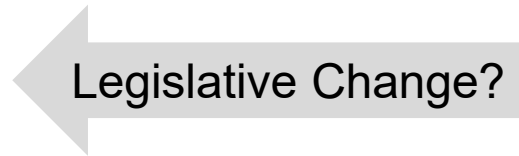
Legislative Change

- Federal Law
- Regulation
- Directive
- ...

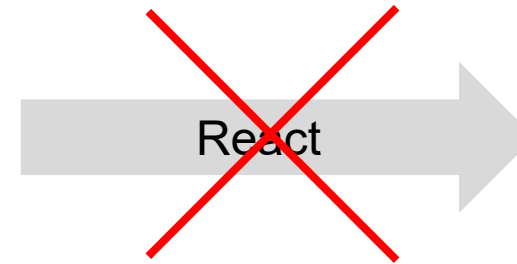
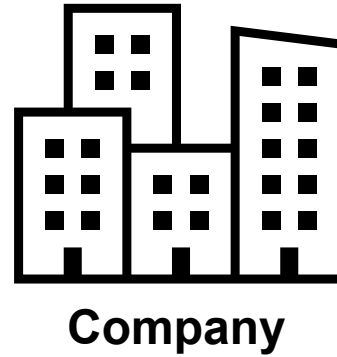


- Legal problems
- Financial problems due to penalty fees





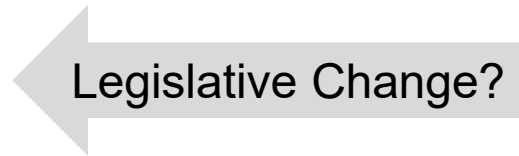
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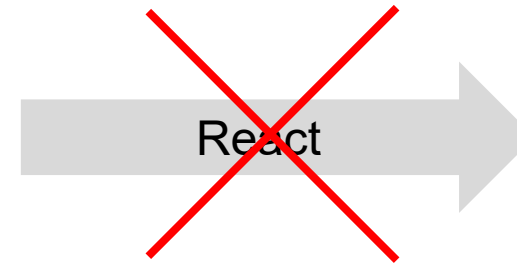
- Legal problems
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Need for Action

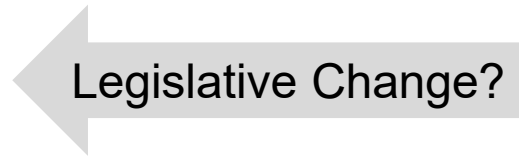


- Federal Law
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- ...

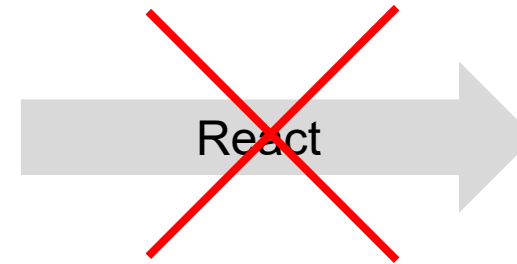


- Legal problems
- Financial problems due to penalty fees





- Federal Law
- Regulation
- Directive
- ...



- Legal problems
- Financial problems due to penalty fees



Is there IT-supported optimization potential through Legal Tech?

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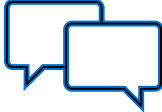


Conclusion and Future Work

RQ1






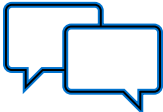

How is the information about legislative changes published?



Research Questions & Approach

RQ1	How is the information about legislative changes published?	
RQ2	How does the information about a legislative change reach the stakeholder inside a company?	
RQ3	How do companies recognize the relevance of legislative changes based on the need for action?	
RQ4	What are the it-supported optimization potentials to improve this process?	

Research Questions & Approach

RQ1	How is the information about legislative changes published?	 
RQ2	How does the information about a legislative change reach the stakeholder inside a company?	
RQ3	How do companies recognize the relevance of legislative changes based on the need for action?	
RQ4	What are the it-supported optimization potentials to improve this process?	
RQ5	What could an improved system for publishing legislative changes look like?	 

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Information Publishing - Official Publication Platforms

Gesetze im Internet & OEIL

Federal Government

Gesetze im Internet

Aktualitätendienst

Die meist tagesaktuell hier eingetragenen Hinweise auf neu im Bundesgesetzblatt verkündete Dokumente können als RSS-Feed abonniert werden. Klicken Sie hierzu auf das RSS-Symbol  in der Navigationsleiste bzw. Adresszeile Ihres Browsers oder auf den folgenden Link:

RSS-Feed: [Gesetze im Internet - Aktualitätendienst](#)

Hinweis: Bitte beachten Sie, dass der Internet Explorer 6.0 diese Funktionalität nicht unterstützt! Alternativ kann der RSS-Feed auch über einen externen RSS-Reader abonniert werden.

[BGBl I 2020, 868](#)
Bekanntmachung der Neufassung der Verordnung über die Berufsausbildung im Laborbereich Chemie, Biologie und Lack vom 24. April 2020

[BGBl I 2020, 867](#)
Dreißigste Verordnung zur Änderung der Verordnung zur Übertragung von Befugnissen zum Erlass von Rechtsverordnungen auf die Bundesanstalt für Finanzdienstleistungsaufsicht vom 24. April 2020

[BGBl I 2020, 864](#)
Gesetz zur Durchführung der Verordnung (EU) 2017/821 des Europäischen Parlaments und des Rates vom 17. Mai 2017 zur Festlegung von Pflichten zur Erfüllung der Sorgfaltspflichten in der Lieferkette für Unionseinführer von Zinn, Tantal, Wolfram, deren Erzen und Gold aus Konflikt- und Hochrisikogebieten sowie zur Änderung des Bundesberggesetzes vom 29. April 2020

Source: www.gesetze-im-internet.de

- By the Federal Ministry of Justice
- Publishes every adopted legislative change
- Offers an RSS service

European Government

The Legislative Observatory (OEIL)



Source: www.oeil.secure.europarl.europa.eu

- By the European Parliament
- Publishes every adopted legislative change
- Offers an RSS- and Notification-Service
- Also includes legislative changes before adoption
- Search function

Information Publishing - Private Publication Platforms

buzer.de & juris

buzer.de

Vorschriftensuche Volltextsuche
 1 GG suchen Volltextsuche suchen
 § / Artikel Gesetz

Sie sind hier: Start > Änderungen in den nächsten 100 Tagen

Anstehende Änderungen

In der folgenden Tabelle finden Sie bereits verkündete gesetzliche Änderungen, die demnächst in Kraft treten. Die Liste ist auf die nächsten 100 Tage begrenzt. Gerade in Kraft getretene Änderungen finden Sie im Menü unter "aktuell". Sie können die Auswahl auch auf einzelne Sachgebiete oder -ebenen begrenzen:

Diese Übersicht immer aktuell auf Ihrer Internetseite? Binden Sie einfach das [Gesetze-Widget](#) ein!

Sie können sich auch gezielt per Email über Änderungen informieren lassen - für einzelne Sachgebiete, Titel oder sämtliche Änderungen - [jetzt abonnieren](#).

Sachgebiet filtern:
 alle Sachgebiete filtern

am	treten folgende Normen bzw. Teile der Norm in Kraft	deren Artikel bzw. §	ändert ggf. folgende Norm(en) bzw. hebt diese auf
26.05.2020	Terminservice- und Versorgungsgesetz (TSVG) vom 06.05.2019 (BGBl. I S. 646, Nr. 18)	Artikel 1	Sozialgesetzbuch (SGB) Fünftes Buch (V) - Gesetzliche Krankenversicherung - (SGB V) Änderungen / Synopse

Source: www.buzer.de

- Private database based on the Open Access principle
- Publishes every adopted legislative change
- Offers an RSS- and email notification service
- Also includes legislative changes before adoption
- For federal laws only

juris

juris Das Rechtsportal

Unternehmen Aktuelles Produkte Karriere Kundenservice Newsletter Kontakt

Login

Benutzername

Passwort

Login

- » Passwort vergessen?
- » Freischalten
- » Online-Hilfe

juris Nachrichten

- Die wichtigsten Entscheidungen
- Gesetzesentwicklungen und -vorhaben
- Tagesaktuelle Auswahl der juris Redaktion

» Die juris Nachrichten App jetzt gratis herunterladen

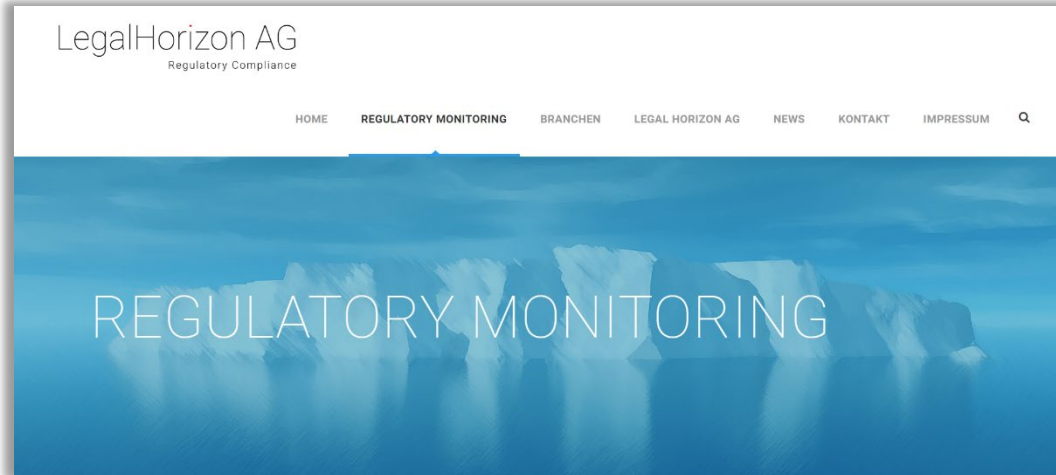
Source: www.juris.de

- The market leader on the German market for electronic legal information
- Publishes every adopted legislative change
- Federal and European Law
- Notification service, but only for chosen laws

Information Publishing - Private Publication Platforms

Legal Horizon AG & PwC Compliance Monitoring Tool

Legal Horizon AG



Source: www.legalhorizon.de

- For federal and European law
- Also includes legislative changes before adoption
- Notification system with automatic relevance check

PwC Compliance Monitoring Tool



Source: www.pwc.at

- For federal and European law
- Also includes legislative changes before adoption
- Notification system with automatic relevance check

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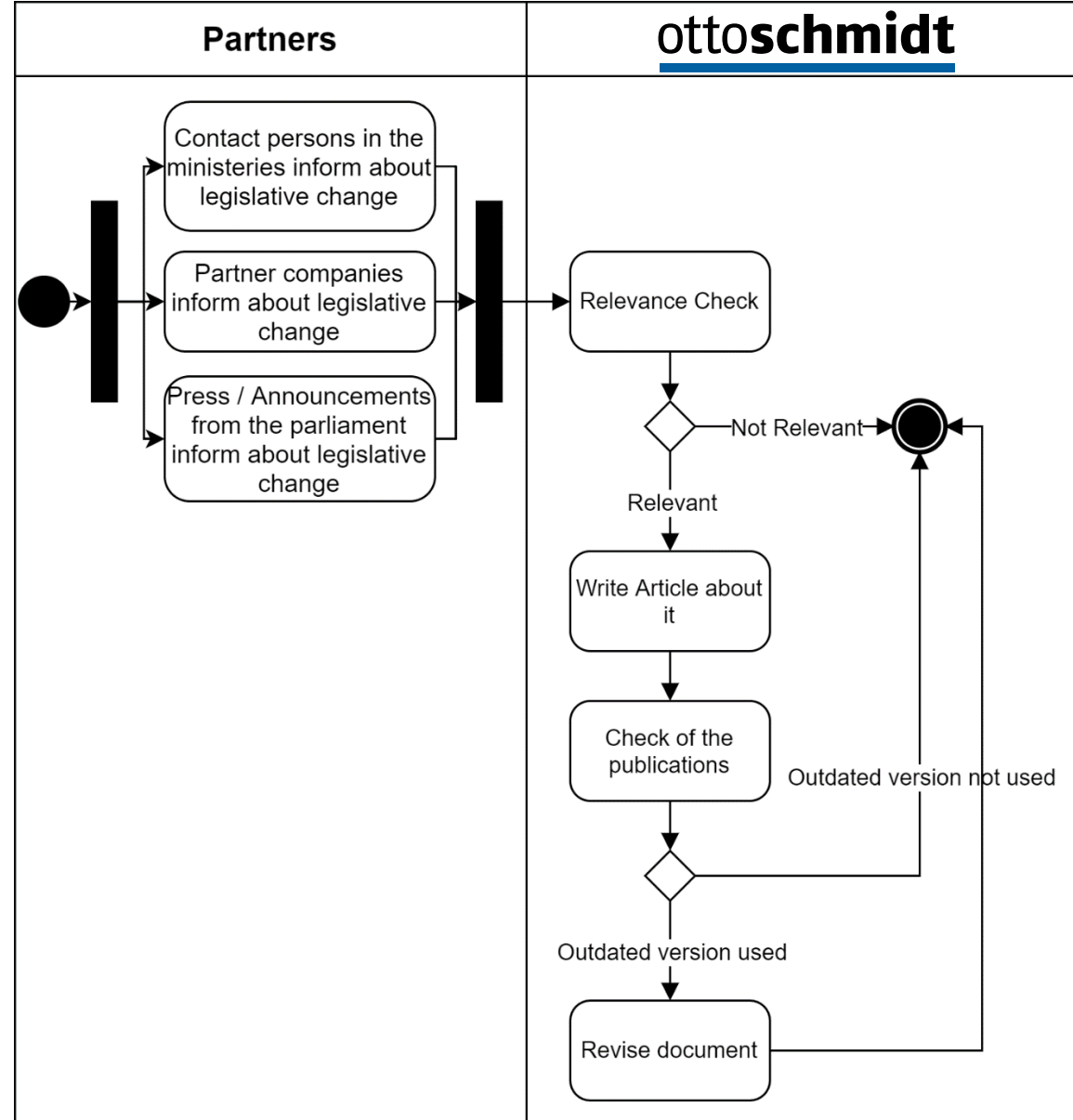
Optimization Potential

Conception of an Improved System

Conclusion and Future Work

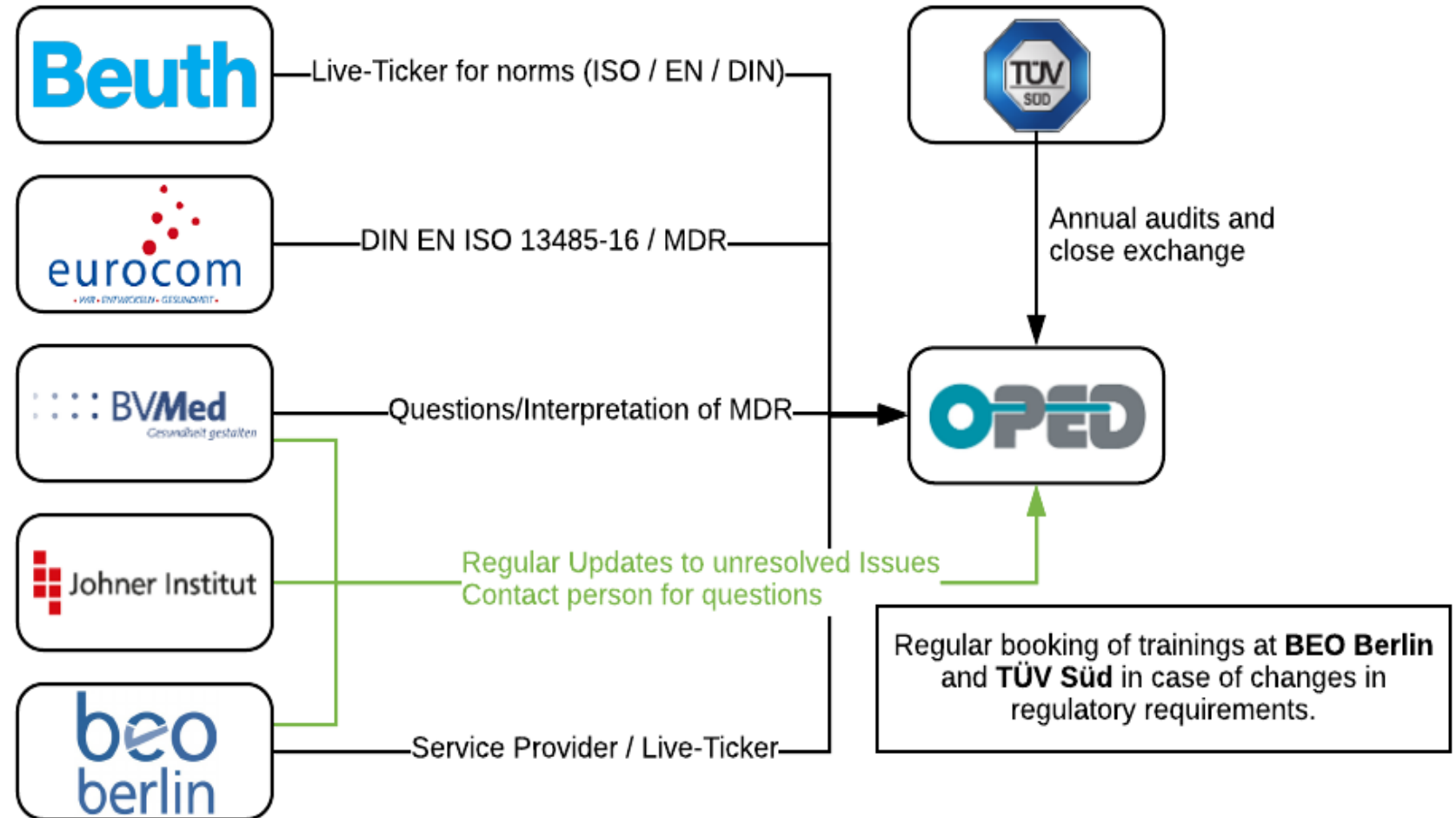
ottoschmidt

- legal publishing house
- specializes primarily in corporate law and tax law
- Sell legal journals, law commentaries and training programs





- manufacturer of medical devices
- The company is interested in all standards and regulations concerning medical products



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ottoschmidt

- Use a system that automatically informs about changes in the law
- Dr. Otto Schmidt Verlag, as a partner of Juris, could use their service
- **Problem:** Not an optimization. The same work is now being done by other companies.



- Not being dependent on so many partners
- Monitor the legislation by themselves not economical
- Dependant on legal experts to explain and interpret the laws

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New Law Amendment Publication System

Motivation

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Conception of an Improved System - Requirements

R1

All information on one web portal that keeps you informed about changes in the law.

Conception of an Improved System - Requirements

R1

All information on one web portal that keeps you informed about changes in the law.

R2

The amendments to the law must be uploaded at the earliest possible time. Not just when they are passed.

Conception of an Improved System - Requirements

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All information on one web portal that keeps you informed about changes in the law.

R2

The amendments to the law must be uploaded at the earliest possible time. Not just when they are passed.

R3

The publication of legislative amendments should be fully automated.

Conception of an Improved System - Requirements

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All information on one web portal that keeps you informed about changes in the law.

R2

The amendments to the law must be uploaded at the earliest possible time. Not just when they are passed.

R3

The publication of legislative amendments should be fully automated.

R4

Legal changes are evaluated according to relevance, and only relevant changes are displayed.

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R3

The publication of legislative amendments should be fully automated.

R4

Legal changes are evaluated according to relevance, and only relevant changes are displayed.

R5

The classification of relevance should be completely automated and, in the best case, constantly improved.

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R6

You can subscribe to specific laws to be notified of any changes.

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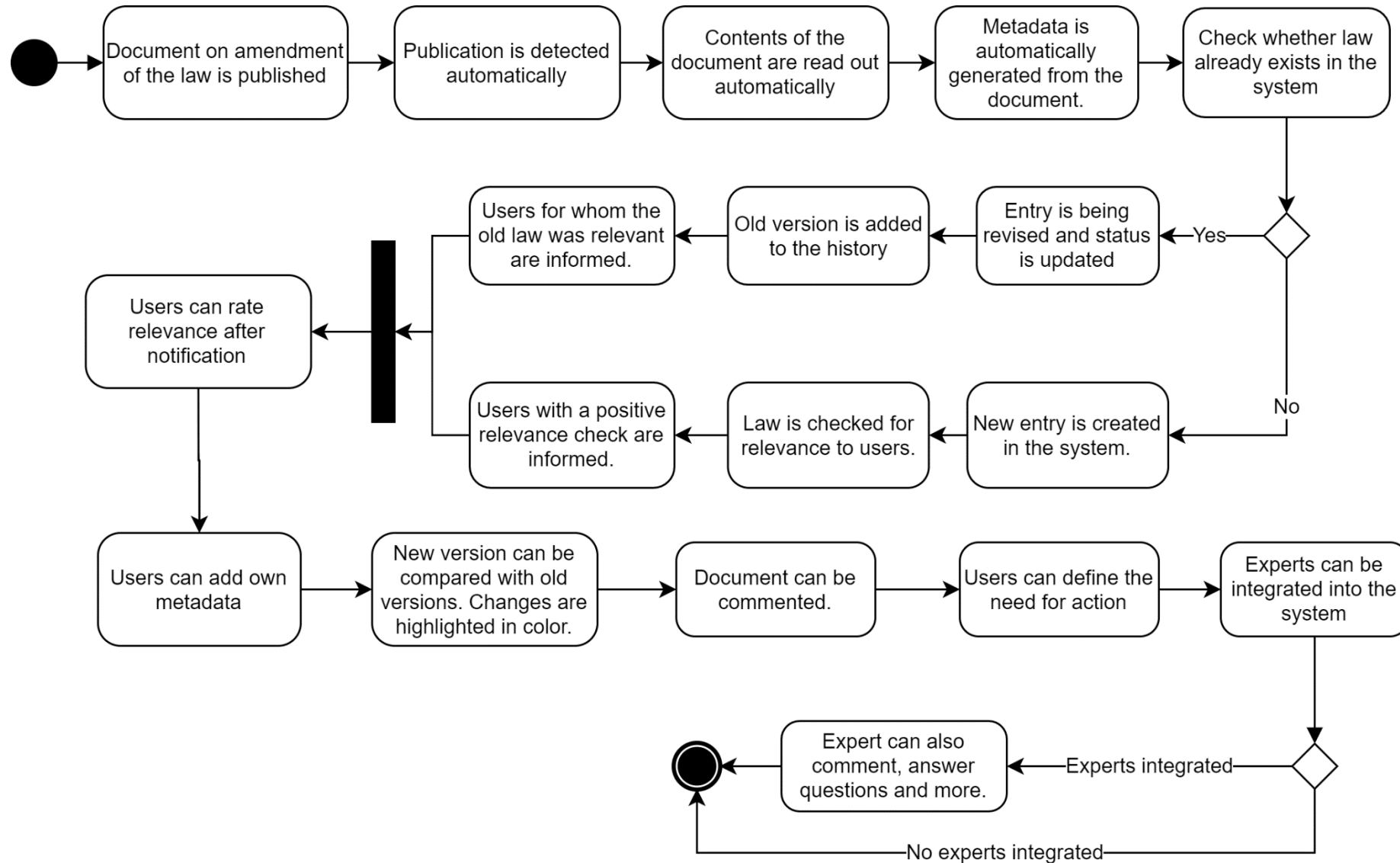
R6

You can subscribe to specific laws to be notified of any changes.

R7

Experts (legal publishers and other) are integrated in the system and can be asked about specific laws.

Conception of an Improved System – System Conception



Conception of an Improved System – Technical Feasibility

R2

The amendments to the law must be uploaded at the earliest possible time. Not just when they are passed.

Conception of an Improved System – Technical Feasibility

R2

Where are legislative amendments published before their adoption?

R2

Where are legislative amendments published before their adoption?

European Government

The Legislative Observatory (OEIL)



- Publishes all documents from the European Parliament
- Including all draft laws and every further step of legislation

Federal Government

Documentation and Information System of the Bundestag (DIP)



Source: www.bundestag.de

- Publishes all documents from the Federal Government
- Including all draft laws and every further step of legislation

Conception of an Improved System – Technical Feasibility

R3

The publication of legislative amendments should be fully automated.

Conception of an Improved System – Technical Feasibility

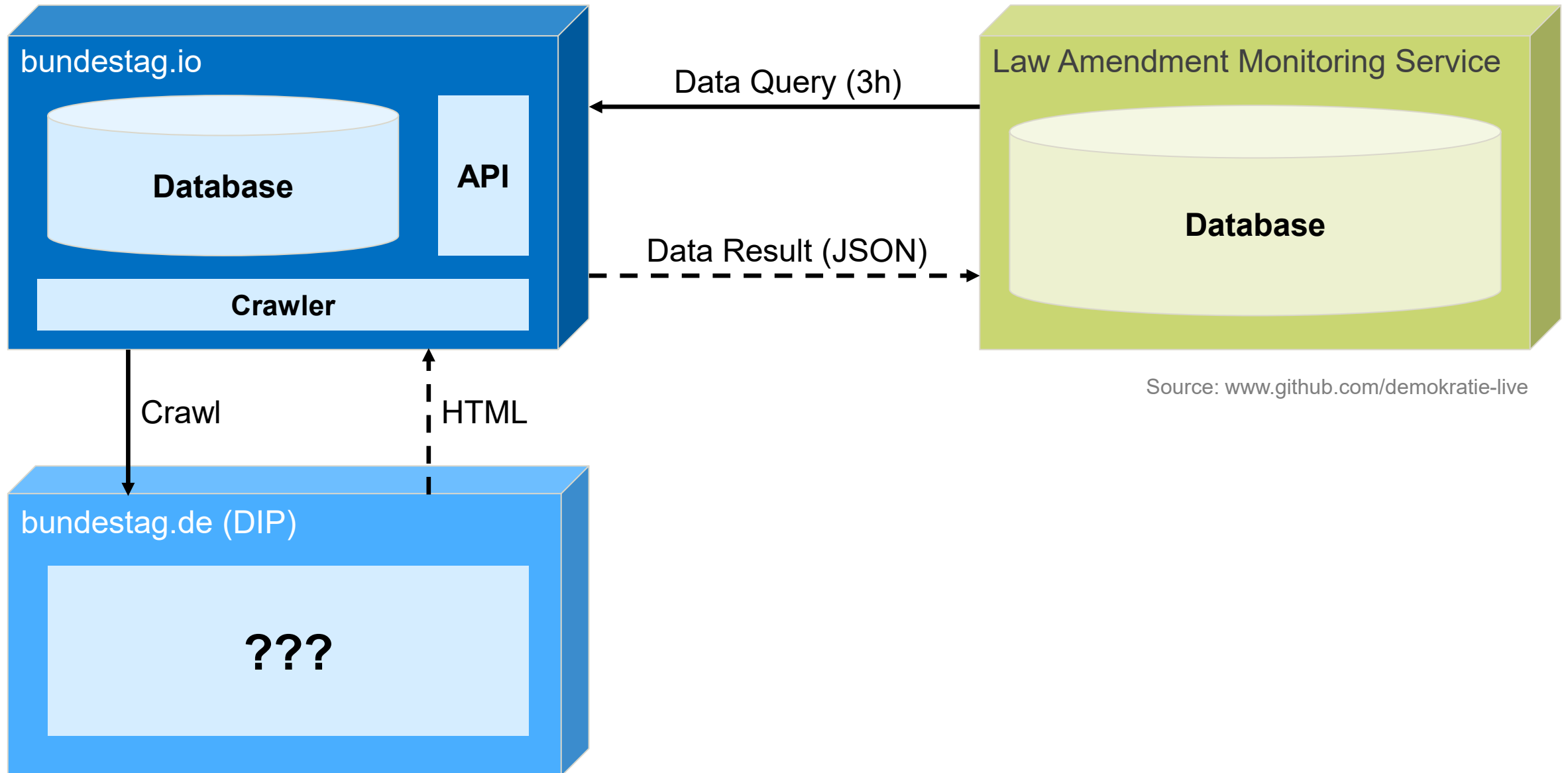
R3

Is there an interface to get the data automatically?

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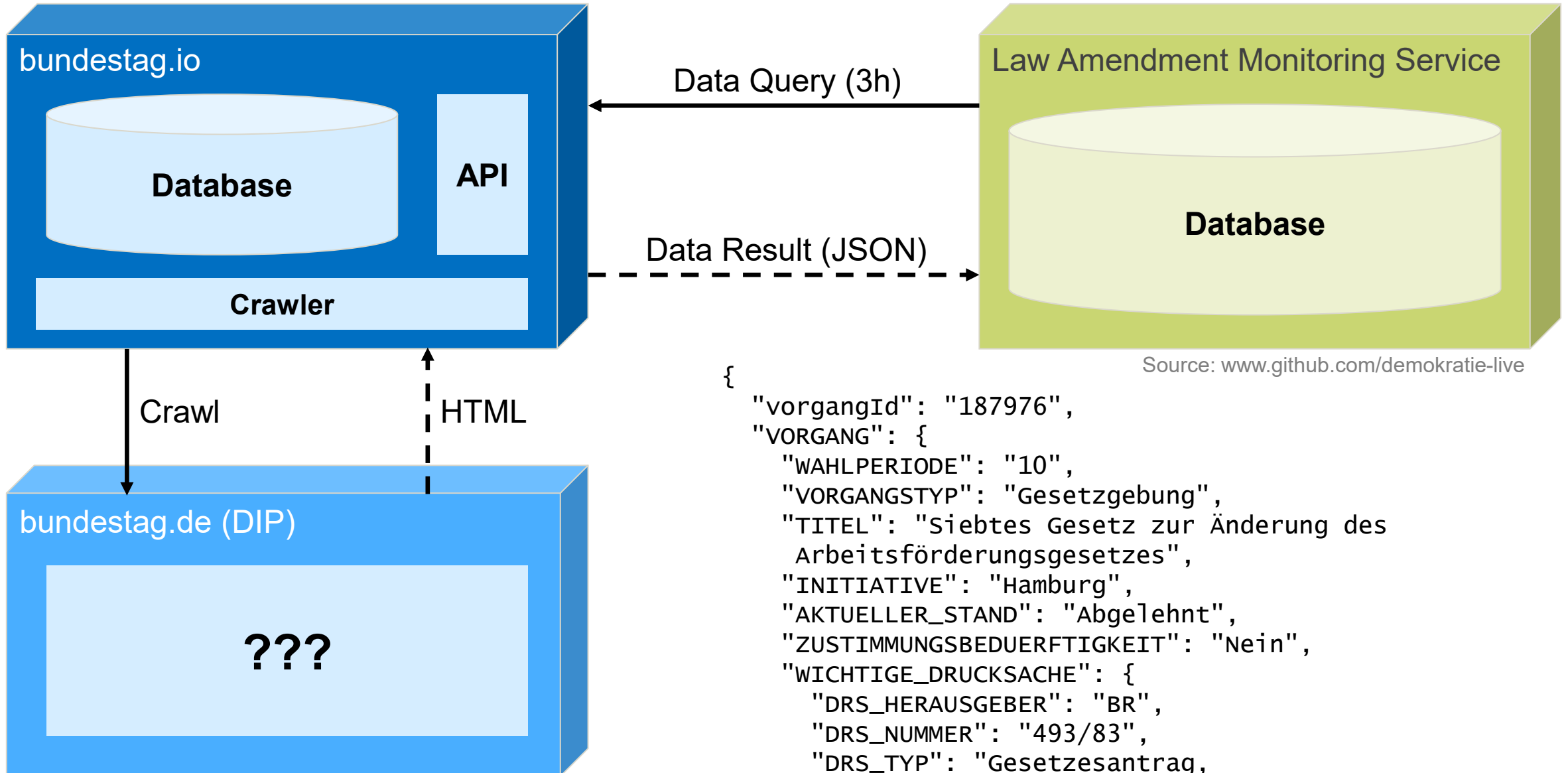
- The European Parliament offers its own API
 - Through these you can access all documents of the European Parliament
 - There is no way to limit a data request to documents on legislation
 - The answer is a JSON file. It is very unstructured and therefore difficult to read
- The DIP does not offer its own API.
 - The association DEMOCRACY Deutschland e.V. has created a freely available API for Bundestag documents, called bundestag.io
 - The request can be limited to legislative documents
 - In response, you get a well-structured JSON with the following information
 - *Title of the law*
 - *Current status*
 - *Link to the law text*
 - *Subject area (e.g. work and employment, education and training, ...)*
 - *Keywords*
 - *Previous legislative procedure of the law*

Conception of an Improved System – Technical Feasibility



Source: www.github.com/demokratie-live

Conception of an Improved System – Technical Feasibility



Source: www.github.com/demokratie-live

```
{  
  "vorgangId": "187976",  
  "VORGANG": {  
    "WAHLPERIODE": "10",  
    "VORGANGSTYP": "Gesetzgebung",  
    "TITEL": "Siebtes Gesetz zur Änderung des  
Arbeitsförderungsgesetzes",  
    "INITIATIVE": "Hamburg",  
    "AKTUELLER_STAND": "Abgelehnt",  
    "ZUSTIMMUNGSBEDUERFTIGKEIT": "Nein",  
    "WICHTIGE_DRUCKSACHE": {  
      "DRS_HER AUSGEBER": "BR",  
      "DRS_NUMMER": "493/83",  
      "DRS_TYP": "Gesetzesantrag",  
    }  
  }  
}
```

[...]

Conception of an Improved System – Technical Feasibility

R4

Legal changes are evaluated according to relevance, and only relevant changes are displayed.

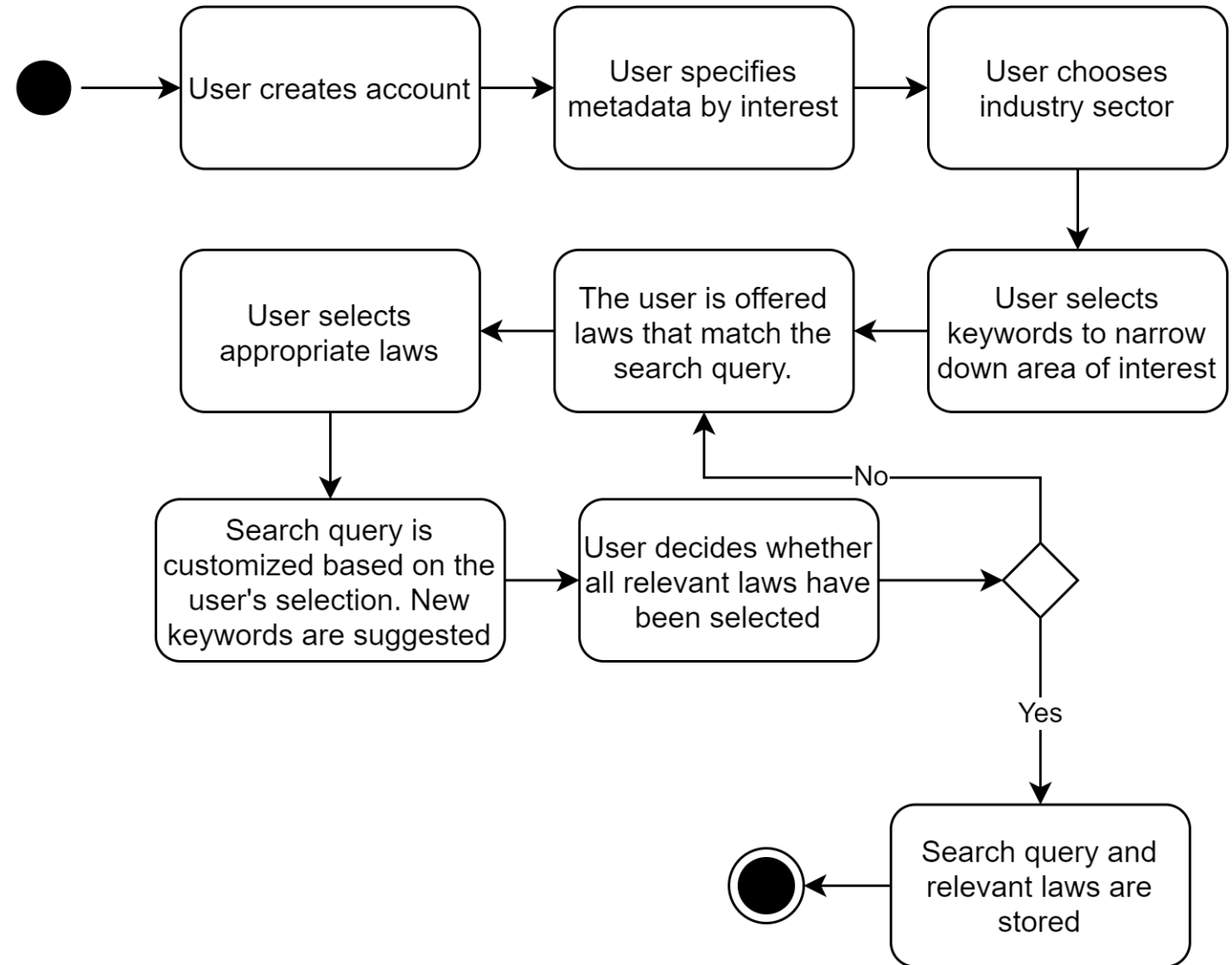
R5

The classification of relevance should be completely automated and, in the best case, constantly improved.

Conception of an Improved System – Technical Feasibility

Metadata-based relevance check

- User chooses...
 - Legislation of interest (European, Federal, state legislation)
 - European and federal states of interest
 - Industry Sector
 - Keywords
 - Specific laws

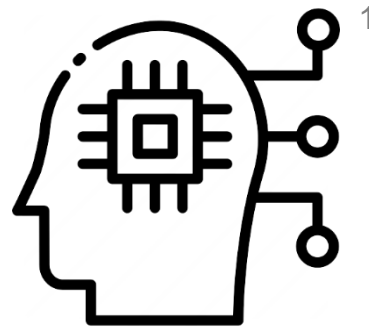


Conception of an Improved System – Technical Feasibility

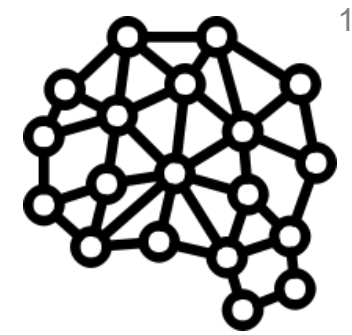
Machine-Learning-based relevance check



**Data classified
as relevant**



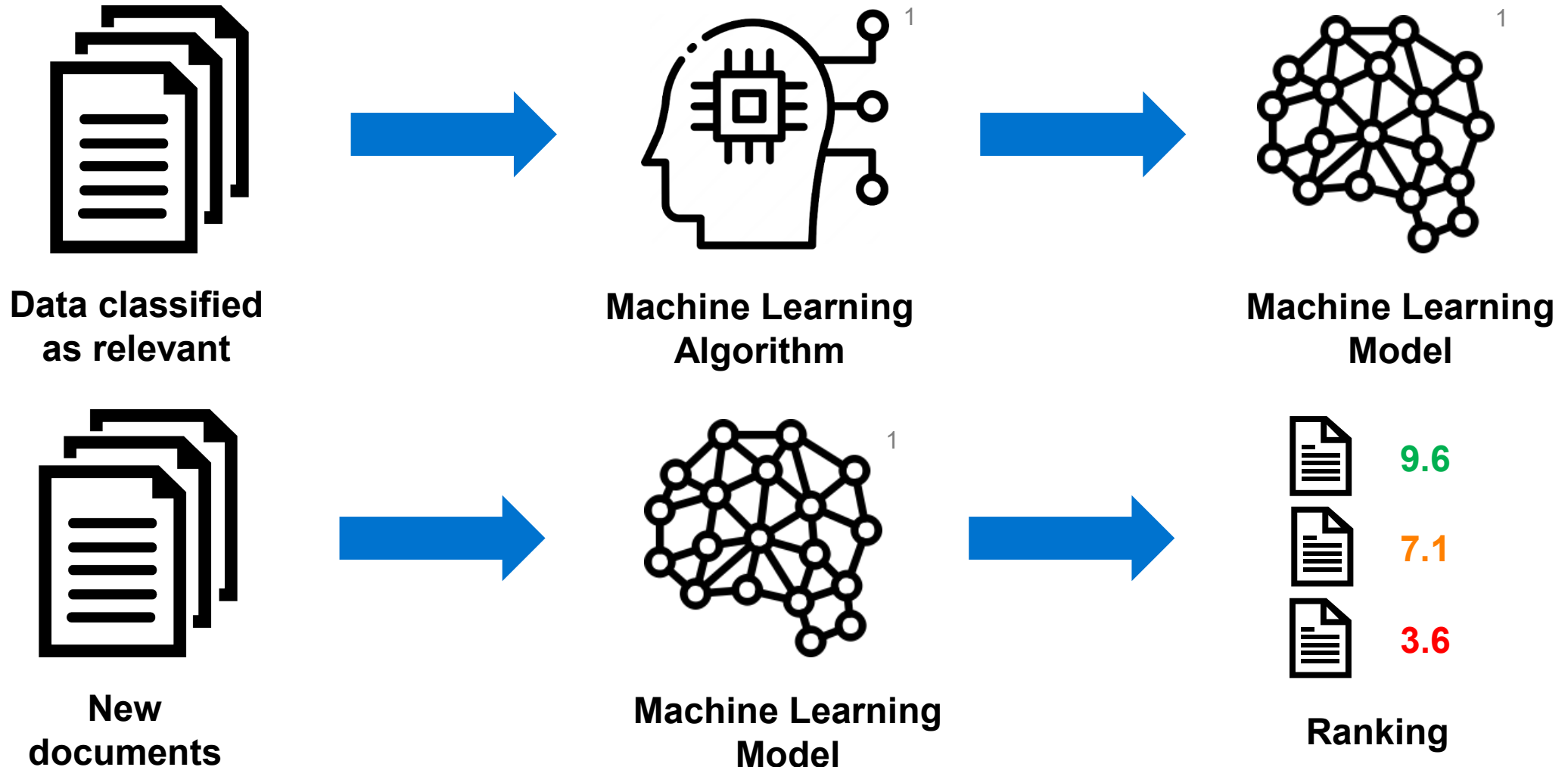
**Machine Learning
Algorithm**



**Machine Learning
Model**

Conception of an Improved System – Technical Feasibility

Machine-Learning-based relevance check



Outline



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- Various publication options for amendments to the law from both the private sector and the legislator
- Companies depend on the help of legal experts (publishers, etc.)
- Legal experts...
 - ...have contact persons in the ministries
 - ...must manually check documents from the legislator
- Companies want to be independent from many different partners
- Legal experts want to be independent of contact persons in ministries

- → **Optimization: New Law Amendment Publication System**
- Laws are published before adoption
- Easy to read out automatically at federal level, more difficult at European level
- Relevance check possible in two ways
 - Metadata-based checking requires legal changes linked to metadata
 - Machine learning based check requires a large amount of documents classified as relevant
- New law amendment publication system can be implemented purely technically

- Implementation of such a system
- Challenges:
 - Federalism
 - Implementation of a web crawler for each legislative level if no API is available
 - Extension of the system with other countries
 - Integration of legal experts into the system
 - Creation of a machine learning algorithm for the relevance check



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www.matthes.in.tum.de



Backup

Information Publishing - Overview

	German Laws	European Laws	Unadopted Laws	Notification Service	RSS-Service
Bundesgesetzblatt	✓	✗	✗	✗	✗
OJEU	✗	✓	✗	✗	✗
Gesetze im Internet	✓	✗	✗	✗	✓
OEIL	✗	✓	✓	✓	✓
buzer.de	✓	✗	✓	✓	✓
juris	✓	✓	✗	✓	✗
Legal Horizon AG	✓	✓	✓	✓	✗
PwC Compliance Monitoring Tool	✓	✓	✓	✓	✗

R8 Laws can be viewed in different versions.

R9 Old and new versions of law can be placed next to each other for comparison, and changes are highlighted in color.

R10 It can be searched for laws and filtered by metadata. Users can add own tags and metadata to a law

R11 The laws are stored in a category tree.

R12 A traffic light system allows the status of a law or draft law to be viewed.

R13 Through a time-line, you can jump into old versions of the law and view the version of a particular day.