

Legistical Efforts By E-Government

Wolfgang Kahlig, Eleonora Kahlig
CONTACT-EDV AG

Academy of software-development and structuring of legal relationships
kahlig@attglobal.net wolf.kahlig@edu.fw-wien.ac.at

Abstract. *“Simple” rules and laws are necessary for the understanding of the meaning and of the content. This is a fundamental claim of all citizens. The instruments of legislation are deeply connected in many countries to the principles of the Roman law and to the ideas of the former centuries. Modern effective aspects, such as visualization, structuring and object-orientation are not focused. One method for handling complex projects is UML, the „Unified Modeling Language“. This tool has served for some years as an instrument in understanding the complex structures of the law, but could also be applied to the complete establishing, administration and development of a new and modern building of law.*

Keywords. *Rules for legislation, visualization, structuring, object-orientation, UML*

Introduction [¹]

The law primarily has a linguistic representation especially within language-constructs. This is changing, and the representation is becoming more multi-layered, both in terms of the form (text corpus as a legal information system, citizen portals, formalization, structure, images, graphics, input forms, etc.) as well as the legal regime (international law, EU law, national law, etc.). A linguistic transformation is taking place in the concretization of general norms by practice and courts. The law is becoming multi-layered and multi-sensory: To the language with its different terms are added pictures, flow charts, videos, graphics etc. but also semantic, automatically processed versions (legal ontologies, logical structures, etc.). This diversity makes it

[¹] The leading topic of IRIS2012, Erich Schweighofer, august 23th, 2011

possible to reach all population groups and to support semantic and automatic processing of content by using the means of electronic instruments.

Multi-layered representation.

Traditional Legislative Process.

In the former centuries – according to the rules of the Roman law - the law primarily has a linguistic representation especially with language-constructs. Examples can be found in the whole law. In the majority of cases there aren't any pictures of the structural context, no images, no graphics or any forms. According to the notation in former centuries we often get very long and nested sentences, which are incomprehensible for jurists too. The average of our citizen has to spend a lot of time reading the legal text over and over to get an idea, what the writer is trying to say or express.

Possible Methods of Analyzing.

1.1. Methods of Other Sciences.

- **Object Orientation** is an attempt to develop structures of organi-

zation as well as “software” by classification of information using their characteristics and the possible operations. An object-oriented design is part of object oriented methodology and forces the analyst to think more in terms of objects and less in procedures. An object contains encapsulated data and procedures which are grouped together to represent an entity. Therefore the interface between the objects is exactly defined.

- Methods such as **UML**, the “**Unified Modeling Language**” are models of standardized visual specification language for object modeling and a general-purpose modeling language that includes a graphical notation. This tool allows you to create an abstract, but standardized model of complex systems.

1.2. Fundamental Aspects.

Information, what should be done or what should be omitted

in certain situations must be described in such a clear and unmistakable manner, that both, persons with different educational background and also computers, can understand the rules and know how to carry them through.

We can recognize governmental efforts in creating “rules” for “rules” and establishing a more variable communication and information system. A lot of administrative functions were built. But all these efforts need urgent completion in the realm of legislation and execution.

The form, the logical processing and the semantic structuring of many parts of the existing set of rules, regulations and laws are often based on a traditional shaping. The knowledge of the modern sciences is not or only in a minimal degree taken into considerations. Overall views and structures are not implemented enough. Instead of clear surveys and instructions the citizen often gets excessively long and nested sentences.

The following example should illustrate the problem (Austrian Law, § 46c MRG, just the first sentence). You don't need to understand this text (in language or meaning), please consider only the syntax and the length:

“§ 46c. Wenn **(IF)** die Voraussetzungen des § 16 Abs. 1 nicht vorliegen, sind dennoch **(THEN)** Vereinbarungen über die Höhe des Hauptmietzinses für eine Wohnung ohne die Beschränkungen des § 16 Abs. 2 bis 4 und 6 bis zu dem für die Wohnung nach Größe, Art, Beschaffenheit, Lage, Ausstattungs- und Erhaltungszustand angemessenen Betrag auch weiterhin zulässig, wenn **(IF)** der Mietgegenstand eine Wohnung der Ausstattungskategorie A oder **(OR)** B in ordnungsgemäßem Zustand ist, deren Standard vom Vermieter nach dem 31. Dezember 1967 durch Zusammenlegung von Wohnungen der Ausstattungskategorie B, C oder D **(OR / OR / OR)**, durch eine andere bautechnische Aus- oder Umgestaltung größeren Ausmaßes einer Wohnung oder mehrerer Wohnungen der Ausstattungskategorien B, C oder D oder sonst **(OR / OR / OR)** unter Aufwendungen erheblicher Mittel angehoben wurde, oder **(OR)** wenn **(IF)** der Mietgegenstand eine Wohnung der Ausstattungskategorie C in ord-

nungsgemäßem Zustand ist, deren Standard vom Vermieter nach dem 31. Dezember 1967 durch Zusammenlegung von Wohnungen der Ausstattungskategorie D, durch eine andere bautechnische Aus- oder Umgestaltung größeren Ausmaßes einer Wohnung oder (OR) mehrerer Wohnungen der Ausstattungskategorie D oder (OR) sonst unter Aufwendung erheblicher Mittel angehoben wurde, sofern (IF) der Vermieter die Arbeiten zur Standardanhebung vor dem 1. Oktober 1993 tatsächlich begonnen hat.”

Let us look only at this first sentence of the paragraph. “MS WORD” counts in the original text 182 words and 1134 signs (without space characters). This sentence alone is composed of 20 lines (in the original text) and shows multiple insertions, interlocks and cross-references. However, it is almost impossible to realize the structure, any connections and the content of such a representation.

1.3. Objective facts.

The main goal for a citizen with an average ability must ultimately be to be able to

quickly and surely recognize, what to do and what to leave. A judicial system should offer a citizen a simple route on how to answer the main questions, without having longer analyses or studies.

This goal can naturally be pursued by the simplification of the laws. However this may cause a disadvantage, such as a “simple” law may be an unfair law. [2]

Suggested Solution

Meta-logical structures have to be formed - logical structures and connections, a warehouse of all similar and/or connected cases and very comfortable searching algorithm, which gives not only answers to the key-words but also to the complex connections and comparable facts.

Establishing of searching - catalogues with an application of standardized words (words in the infinitive, by ignoring of conjugation and declension).

References to fundamental law, ordinances, guidelines, general rules are important.

Requirements for the inquiry by direct and superior structures are relational databases, networked

[2] speech at Kepler-University, Linz, December 2005, “Einfachere oder gerechtere Gesetze”, Kahlig Wolfgang

computer in network-structures, both national and worldwide a networking of universities as well as research centers.

It is essential that logical connections could be available, surveys and above connections can be formed. Each regulation-process, but also each rule must be inserted into a logical structure. The basic idea was that the publication of the law must be extended with electronic means. The further mechanism should integrate the new rule into a logical concept.

2.1 Representation of Structures

Already with a structured order, the items and the parts of sentences can easily be reached. The connections are more easily recognized and logical structures can be obvious so that the content can quickly be surveyed. For instance, the §1 MRG could be presented in such a structure (without change of mind):

§ 1. (1) MIETE / GELTUNGSBEREICH

*Dieses Bundesgesetz gilt für die
Miete von*

- **Wohnungen,**
- **einzelnen Wohnungsteilen** oder
- **Geschäftsräumlichkeiten aller Art**

(wie im besonderen von

- **Geschäftsräumen,**
- **Magazinen,**
- **Werkstätten,**
- **Arbeitsräumen,**
- **Amts-
und Kanzleiräumen)** ...

Now there is no problem to recognize that the items

Wohnungen
einzelnen Wohnungsteilen
Geschäftsräumlichkeiten

do have the same importance or value in the first level, but the items

Geschäftsräumen,
Magazinen,
Werkstätten,
Arbeitsräumen,
Amts-und Kanzleiräumen)

show the same importance or value in the second level.

2.2 Strategies

The further automation, streamlining and simplification will form the basis. Fundamentally, all rules should be formulated in the manner of a daily or with a "check list" and should be simply readable. The principle of the avoidance of lengths and nesting should be considered consistently, as most of the Logistik demand. New techniques are necessary, like charts and tales, displayed clearly on Excel-similar pictures. The visualization [3] by surveying pictures and the means of structure-diagrams, flow charts and graphic diagrams must be raised to the principle.

Also, the important logic - notation with conscious and visible marking of the logical

[³] Heindl / Kahlig / Stingl *Wohn- und Steuerrecht anschaulich*, Manz, 2004, Wien
Heindl / Kahlig: *Mietrecht automatisch*, Manz, 2004, Wien CD-Ausgabe
Heindl / Kahlig: *WEG2002 automatisch*, Manz, 2004, Wien CD-Ausgabe
Kahlig: *Mietrecht einfach*, Eppenber, Wien, 1997
Kahlig: *Handbuch des Immobilienwesens*, CONTACT, 2004, Loseblattausgabe
Lachmayer: *Möglichkeiten einer Verwendung normentheoretischer Analysen für die Gesetzgebung*, Studien zu einer Theorie der Gesetzgebung, Springer-Verlag Berlin-Heidelberg-New York, 1976
Lachmayer: *Regeln zur grafischen Darstellung des Rechts*, Österreichisches Anwaltsblatt, 1976
Lachmayer: *Grafische Darstellungen im Rechtsunterricht*, Zeitschrift für Verkehrsrecht, 1976

“AND”, the logical “OR” and the building of parenthesis is of decisive meaning. It must be considered, that the combination between sentences and/or parts of sentences is made with different conjunctions. So an „AND“ (=„UND“) connects more intensively than an “OR” (=„ODER“). A reversal of this rule is possible, as shown in the following example:

If the event “A” happens and the event “B” happens or event “C” happens, then event “XY” would happen.

would be identical with:

If (the event “A” happens and the event “B” happens)
or
(the event “C” happens),
then event “XY” would happen.

A completely different sense is yielded after changing the parenthesis:

If (the event “A”) and (the event “B” happens or the event “C” happens), then event XY would happen.

In this case the event “C” would now not more determining (not more “sufficient“)!

2.3 Modelling and Structuring

In literature it is often pointed out, that the conjunctions like “AND” / “OR” / “AS WELL AS” are not unambiguously used. It is problematic because the “AND” - connection is sometimes used logically (within the meaning of a logical content) and sometimes linguistically, for instance sometimes as careless (in connection with logical aspects) but usual and/or completion of a chain of “OR” – connections.

Example of §1 MRG:

§ 1. (1) Dieses Bundesgesetz gilt für die **Miete von Wohnungen, einzelnen Wohnungsteilen oder Geschäftsräumlichkeiten aller Art** (...) samt den etwa mitgemieteten (...) Haus- oder Grundflächen (...) **UND für die genossenschaftlichen Nutzungsverträge über derartige Objekte** (...)

The last connection-word (UND/„AND“) represents only a linguistic usage and not a logical „AND“.

The logical content should mediate us really a logical enumeration, therefore the above-mentioned „AND“ is just a connection for the enumeration. The law is intended to inform you, - in spite of this “not-logical” “AND” (und) that this law is made for

die Miete von Wohnungen

OR (also)

einzelnen Wohnungsteilen

OR (also)

Geschäftsräumlichkeiten aller Art (...)

OR (also) !!!

für die genossenschaftlichen Nutzungsverträge über derartige Objekte

“OR” has 2 meanings, namely a “EXCLUDING OR” (formerly, Roman Law: „AUT“) and the “LISTING OR” (formerly, Roman Law: “VEL”)

Often the logical connections are mixed up with the linguistic connection. Therefore you can hear the idea, that you could write the sentence thoroughly with „AND“.

This assertion appears in the first moment OK, if you read:

§ 1. (1) Dieses Bundesgesetz gilt für die
Miete von Wohnungen
AND
einzelnen
Wohnungsteilen
AND
Geschäftsräumlichkeiten
n aller Art ...
AND
für die
genossenschaftlichen
Nutzungsverträge...

But if you are following the exact logistical rules, you get:
[4]

§ 1. (1) Dieses Bundesgesetz gilt nur, wenn es sich handelt um
(this law is only valid, if)

die Miete von
Wohnungen
OR (VEL)
einzelnen
Wohnungsteilen
OR (VEL)
Geschäftsräumlichkeiten
aller Art ...
OR (VEL)
für die genossenschaftlichen
Nutzungsverträge

Ultimately with the “necessary” / “sufficient” – rules you get:

§ 1. (1) Es ist NOTWENDIG, dass es sich um (it is necessary that..)
die Miete von Wohnungen
OR (VEL)
die Mieten von einzelnen
Wohnungsteilen
OR (VEL)
Geschäftsräumlichkeiten
OR (VEL)
für die genossenschaftlichen
Nutzungsverträge...
handelt, damit das
Bundesgesetz gilt.
(Just in these cases you get legal force)

And still more clearly with the conditional if / then – notation:

§ 1. (1) WENN es sich handelt um
(IF you have a ...)
die Miete von Wohnungen
OR (VEL)
die Mieten von einzelnen
Wohnungsteilen
OR (VEL)

.....
DANN (THEN) ist das Bundesgesetz anzuwenden.
(Just in these cases you get legal force)

Thereby it would be clear, that there is only the logical “listing OR” (= VEL) and not

[4] Rechtsmodellierung im E-Government, Fallbeispiele zur Legistik (2005), Diss, Kepler-Universität Linz

the “excluding OR” (= AUT) and not a logical connection with “AND”. (The logical AND would necessitate, that you SIMULTANEOUSLY must have all the above conditions, as

die Miete von Wohnungen

AND SIMULTANEOUSLY

die Miete von einzelnen Wohnungsteilen

AND SIMULTANEOUSLY

die Miete von Geschäftsräumlichkeiten..

AND SIMULTANEOUSLY

genossenschaftliche Nutzungsverträge ...

But this would not be possible, because the terms are absolutely excluding terms.

The mentioned example above, at which in the construction the “and” appears seems in the first moment plausible, but this “and” is actually a “and also”, which would be to be equated with the logical „OR (=lat.VEL) “.

Now we are able to postulate:

Never use the connections “AND”/ “OR”, but always “ET” (logical AND)

**“AUT” (logical excluding OR)
“VEL” (logical listing OR)**

Nevertheless it is possible, that this stringent rule takes some time to get used to. Therefore a minimal demand could be:

**AND usage just as the logical “AND”
OR usage just as the logical excluding “OR”
comma usage just as the logical listing “OR”**

2.4 Conditional –Model

To avoid brackets it is necessary that the authors of law make intellectual “acrobatics”, which are not just beneficial to the legibility. Another example for the severe logical arrangement would be the imperative introduction of the “IF / THEN / ELSE” – clause.

2.5 Models

The dismantling by little steps leads the project to its intended goal. Every Computer works only with the YES/NO decision, therefore it is obvious, that the whole law can be structured into single steps and could be restructured. Specialized symbols derivated from UML are able to structure with the following structure-elements:

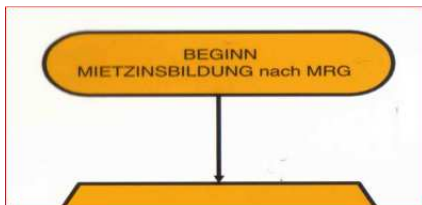


Figure 1: Begin of the facts of the case.

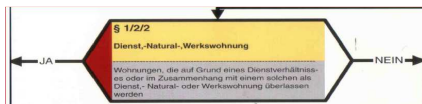


Figure 2: YES/NO - decision

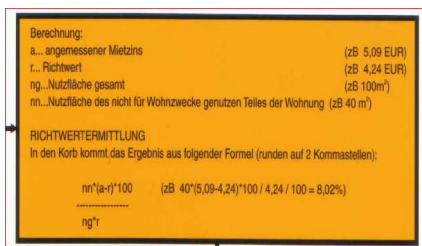


Figure 3: Action

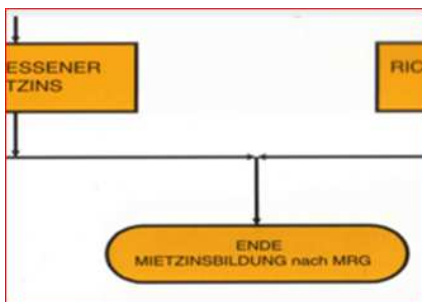


Figure 4: End of the facts of this case.

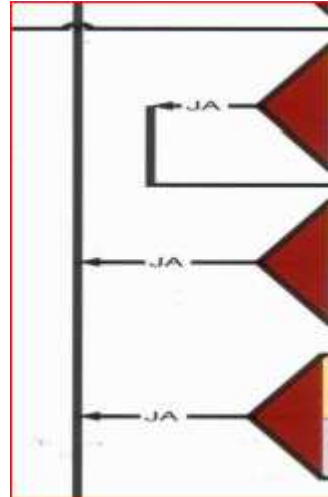


Figure 5: Workflow- element

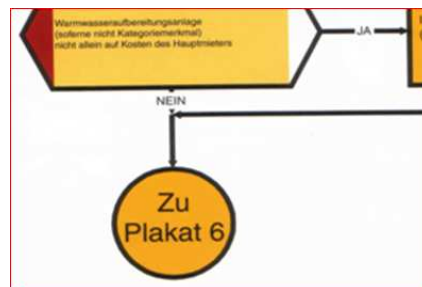


Figure 6: Logical connection

These 6 elements could manage all interrelations.

Outlook and Concrete Steps

3.1 National and International Defined, Logical Elements of Law.

The education of teams and the development of superior, international elements will be inevitable.

3.2. Principals

3.2.1. Acceptance

The embarking on of unusual ways must be allowed and it must become the rule. The pertinent and neutral judgment of the foreign opinion and/or conviction is essential. (Quotation Ludwig Adamovich: "This Jurisprudence is underdeveloped, which limits itself to dogmatic")

3.2.2. Initiatives / No Wrong Fears

Often a pretext is pleaded to block innovations. A classical, historic example is the rejection of printing books in the former centuries. Each new idea naturally has advantages and disadvantages, which must be weighed out reciprocally. From the current view the printing would not have been stopped with such extreme resistance.

Outdated fears, which look to block the progress, must be disassembled.

3.2.3. Concrete and Neutral Control-elements

It would be essential that a control authority would be arranged for a very broad basis.

Conclusion

The Legistik - rules must be completed thus after the above-mentioned postulates. [5]-[26] Creation of a thesaurus on the basis of object-oriented models will be helpful. A powerful modeling language, as "UML" would help to create the whole system. After the installation and training of the described methodologies the running care and a relative simple expansion would possible. Thereby the rules could become simpler and more understandable and will help to avoid some of the expenses. New models, as shown above will have a central position.

Additional References

- [5] Adamovich, Ludwig, Probleme einer modernen Gesetzestechnik, in: Winkler, G. / Schilcher, B. (Hsg.), Gesetzgebung, Wien (1981)
- [6] Heindl / Kahlig, Mietrecht anschaulich, Manz, 2001, Wien
- [7] Heindl / Kahlig, Mietrecht anschaulich, Manz, 2002, Wien
- [8] Heindl / Kahlig, Wohnrecht anschaulich, Manz, 2003, Wien
- [9] Heindl / Stingl / Kahlig, Wohn- und Steuerrecht anschaulich, Manz, 2004, Wien
- [10] Heindl / Stingl / Kahlig, Wohn- und Steuerrecht anschaulich - Gesamtausgabe, Manz, 2004, Wien
- [11] Heindl / Kahlig, Mietrecht automatisch, Manz, 2004, Wien CD-Ausgabe
- [12] Heindl / Kahlig, WEG2002 automatisch, Manz, 2004, Wien CD-Ausgabe
- [13] Kahlig, Mietrecht einfach, Eppenberger, Wien, 1997
- [14] Kahlig, Handbuch des Immobilienwesens, CONTACT, 2004, Loseblattausgabe
- [15] Kahlig Steuer-Handbuch des Immobilienwesens, CONTACT, 1996, Loseblattausgabe
- [16] Stingl / Kahlig, Beiblätter im Steuerrecht anschaulich, Manz, 2004
- [17] Stingl / Kahlig, Beiblätter im Steuerrecht automatisch, Manz, 2005
- [18] Lachmayer / Reisinger, Legistische Analyse der Struktur von Gesetzen, Manz, 1976, Wien
- [19] Lachmayer: Grafische Darstellungen als Hilfsmittel des Gesetzgebers, Gesetzgebungstheorie, Juristische Logik, Zivil- und Prozessrecht, Springer-Verlag Berlin-Heidelberg-New York, 1978
- [20] Lachmayer, Visualisierung des Rechts, Akten des 2. Semiotischen Kolloquiums, Regensburg, 1978
- [21] Wimmer Maria / Traunmüller Roland / Lenk R. Electronic Business invading the Public Sector, Proceedings of the 34th Hawaii, International Conference on System Sciences, Hawaii 2001
- [22] Kahlig Wolfgang, Rechtsmodellierung im e-Government, vdm Müller, 2008

[23] Kahlig Wolfgang,
Klagenfurter
Legistikgespräche November
2008, ABGB 2011
strukturiert, Klagenfurt
2009

[24] Heindl / Kahlig /
Österreicher / Sommer,
WGG strukturiert, MANZ,
2011

[25] Heindl / Kahlig /
Österreicher / Sommer,
WGG II strukturiert, MANZ,
2012

[26] Heindl / Kahlig /
Österreicher / Sommer,
WGG - Navigator, MANZ,
2012