



Aspects of intelligent Legal Research Solutions

Evolutions of Semantic Search in the Legal Domain

SEMANTiCS 2018
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- LexisNexis - Brief Overview
- The State of Legal Research
- Knowledge Graphs
 - Why?
 - Use Cases
- Natural Language Processing
 - How it works
 - Use Cases

- Leading global provider of legal research and workflow solutions.
- Legal & Professional Solutions
- Risk Solutions
- Part of RELX Group, a global provider of information and analytics
- Offices in about 40 countries
- Customers in more than 180 countries
- Employs approximately 30,000 people



The State of Digital Legal Research

1970s

Good At

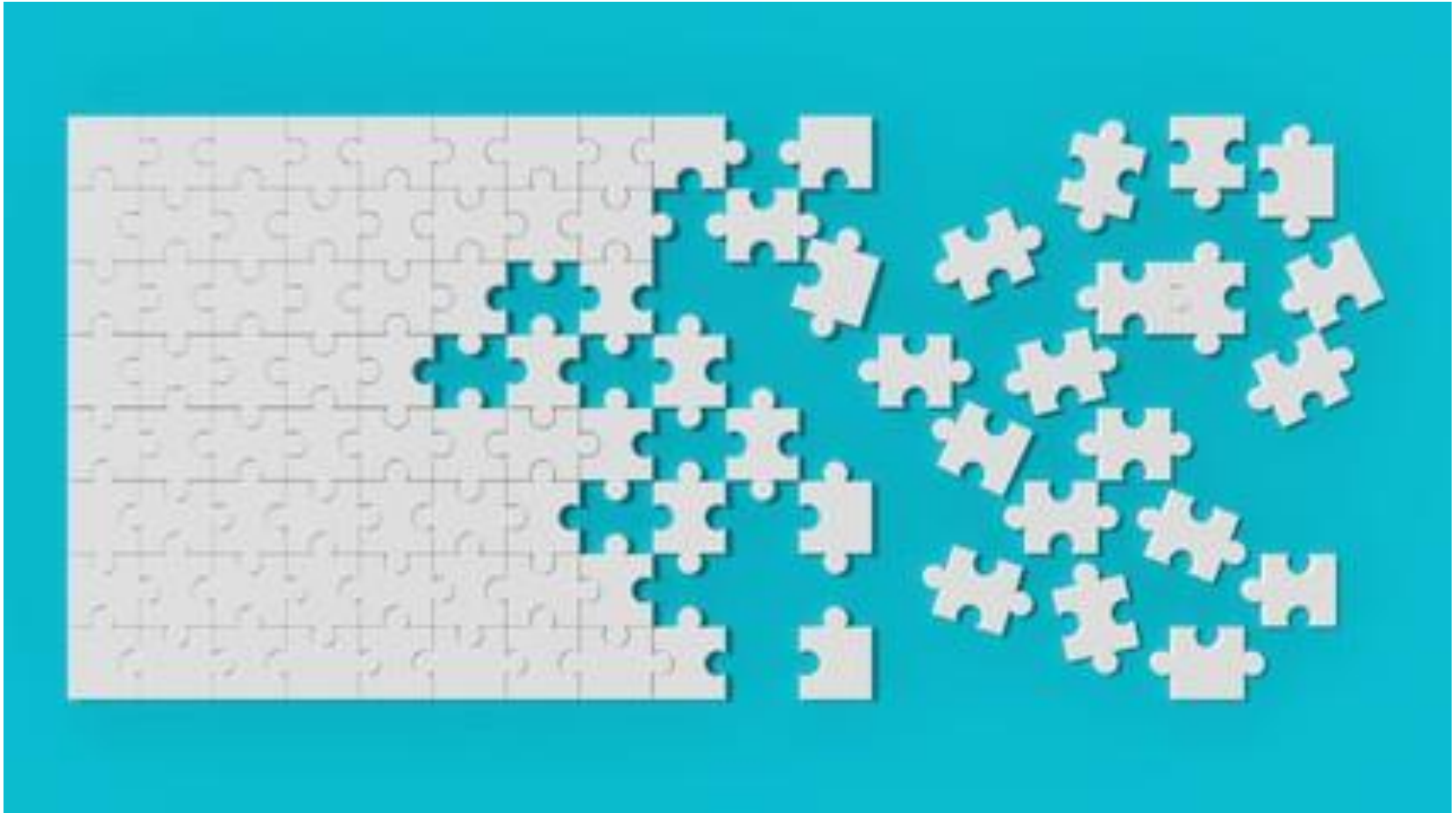
- Storing huge amounts of information
- Offering all the resources you may need
- Retrieving results quickly
- Locating every reference to your search string

Working On

- Providing an easy to use system
- Retrieving highly relevant results
- Retrieving the right amount of results
- Surfacing Connections and Cross References
- Recommending Documents
- Better understand Query Intent
- Improve Query understanding (NLU)
- Providing Answers

Today

The State of Digital Legal Research



Digital Legal Research - Directives

Understand my
“natural
language”

Give me
suggestions

Give me
answers, not
results lists

Compute
answers: Don't
give me search
strings

Personalize my
experience:
Know me

Guide me

Give me a more
human
interaction

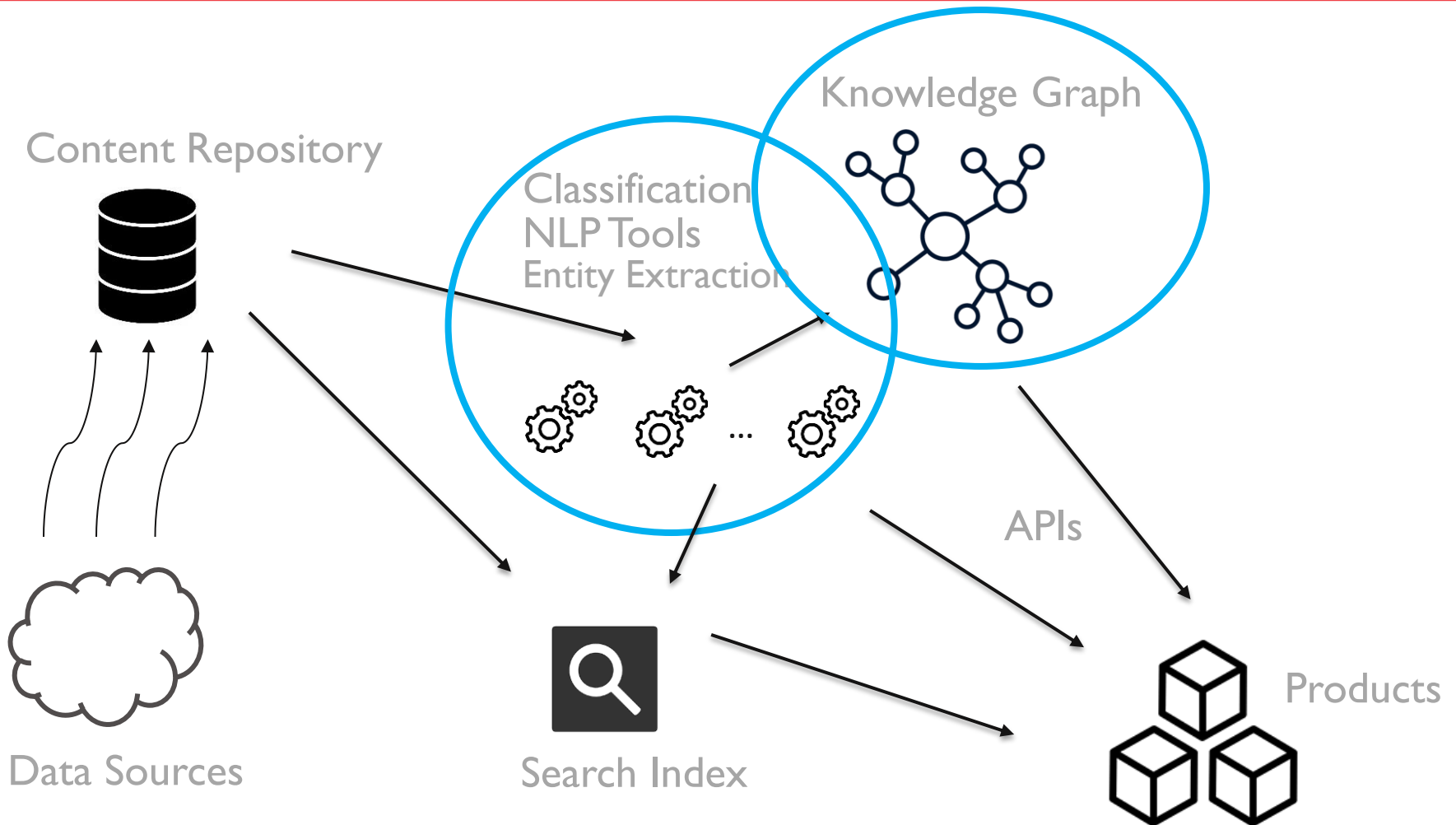
Help me
navigate the
data

Show me
insights and
analytics

Help me make
winning
arguments

Help me know
when I'm done

Semantic Data Workflow



Knowledge Graph

- Represents a Knowledge Domain
- Nodes, Relationships, Labels, Properties
- Fast
- Easy to understand
- Schema-less for rapid, iterative development
- Good for doing complex traversal
- Can be enriched with ML assets
- Takes time to build a comprehensive, high precision graph

Use Cases:

Lexis SmartSearch, Visualizations/Analytics, Monitoring Legislation

Use Case - Understanding Query Intent

Lexis 360 SmartSearch

Lexis 360® Max Mustermann

44 Ergebnisse für 2Ob194/14i [Ergebnisse filtern](#)

Lexis SmartSearch empfiehlt folgende Top-Ergebnisse

OGH 2Ob194/14i

OGH Volltexte • 08.06.2015

Begründung

Für die nunmehrige Erblasserin war zu AZ 2 P ***** des Bezirksgerichts H***** ein Sachwalter bestellt. Im vorliegenden Verlassenschaftsverfahren, das mittlerweile vom... [Weiterlesen](#)

Entscheidungsbearbeitung [Rechtssatz](#) [Kommentar](#) [Artikel](#)

[Verlassenschaftsverfahren, Einsicht in den Pflegschaftsakt. \(Jus-Extra-Jus-Extra OGH-Z 2015/5854\)](#)
JUS EXTRA - Gesetzgebung, Rechtsprechung und Literatur • Angst/Schwarz • Jus-Extra 2015/5854 • 01.10.2015

[Einsicht in den Sachwalterschaftsakt des Verstorbenen durch Parteien des Erbrechtsverfahrens \(Zak 2015/596\)](#)
Zak - Zivilrecht aktuell • Bearbeiter: Wolfgang Kolmasch • Zak 2015/596 • 22.09.2015

Alle Ergebnisse

OGH 2Ob194/14i

OGH Volltexte • 08.06.2015

Der Oberste Gerichtshof hat durch den Senatspräsidenten Hon.-Prof. Dr. Danzl als Vorsitzenden sowie die Hofrätin Dr. E. Solé und den Hofrat Dr. Nowotny als weitere Richter in der Verlassenschaftssache nach M***** P***** verstorben am *****, zuletzt wohnhaft in *****, über den außerordentlichen Revisionsrekurs des erbantrittserklärten Erben Dr. J***** L*****, vertreten durch Dr. Wolfgang Leitner, Priv.-Doz. Dr. Max Leitner und Dr. Marie-Sophie

User Subscription Standard User

360 Suche starten Begriff eingeben

QueryAnalyzer

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<queryAnalysis>
  <searchString>
    <match alternative="2 Ob 194/14i" exactphrase="yes" type="CASE">2Ob194/14i</match>
  </searchString>
  <userSubscription>testSubscription</userSubscription>
</queryAnalysis>
```

AFS LINK
CERT 04
CERT 05

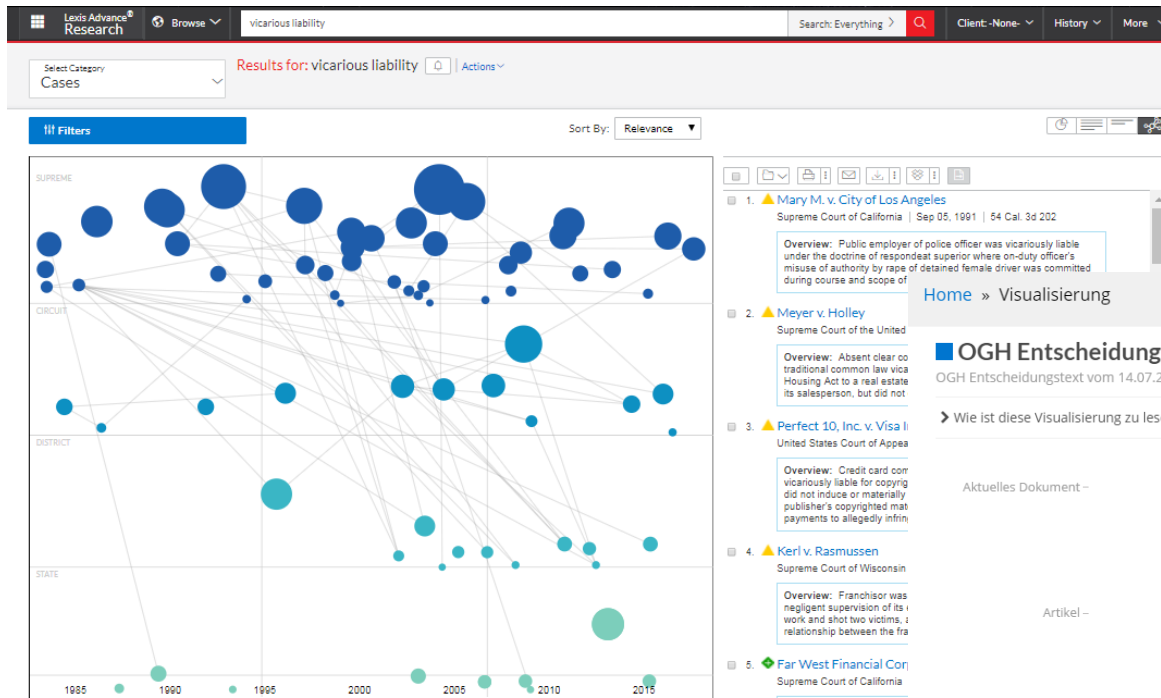
Performance GS #1: 406ms

GraphSearch

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<response label="Lexis SmartSearch empfiehlt folgende Top-Ergebnisse">
  <main>
    <item type="document">
      <doc-id>u_zivil_OGH_2015_JJT_20150608_OGH0002_0_1d2c89015a</doc-id>
    </item>
  </main>
  <related>
    <cluster label="Entscheidungsbearbeitung">
      <item type="document">
        <doc-id>z_jus_extra_2015_358_jus_2015_0358_5_00_28eabc0cb0</doc-id>
      </item>
      <item type="document">
        <doc-id>z_zak_2015_17_Zak_2015_17_596_8189a22e23</doc-id>
      </item>
      <item type="document">
        <doc-id>z_jbl_2015_9_jbl_2015_09_0597_9eac45b80e</doc-id>
      </item>
    </cluster>
  </related>
</response>
```

Use Case – Visualizations/Analytics

Lexis Advance – Ravel Integration



Quickly spot important cases and how other cases have treated them

Lexis 360

OGH Entscheidung 5Ob121/15b

OGH Entscheidungstext vom 14.07.2015 5Ob121/15b

Wie ist diese Visualisierung zu lesen?

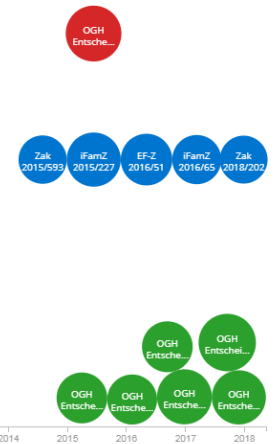
Aktuelles Dokument –

Artikel –

Rechtssatz –

Entscheidung –

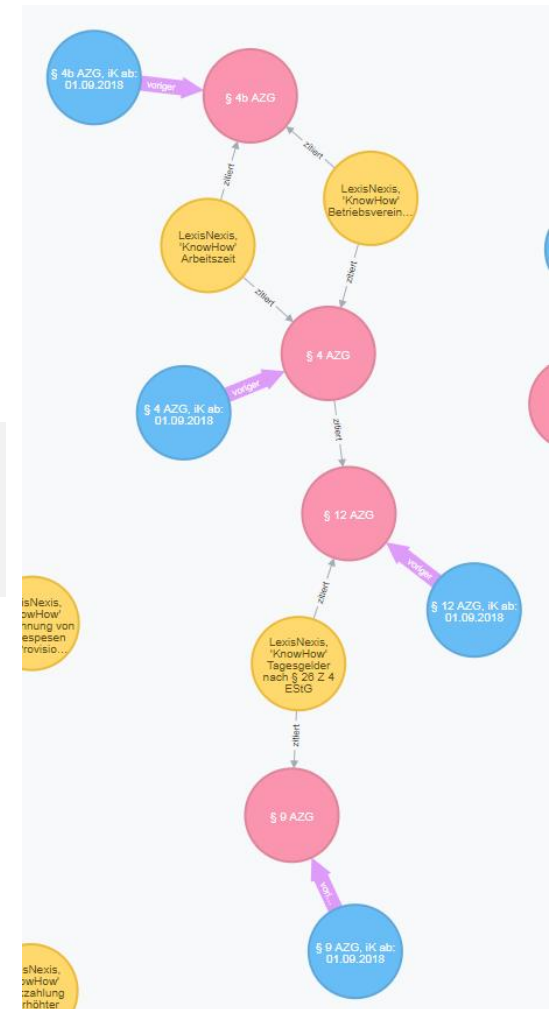
- Startpunkt
- Artikel
- Entscheidung
- Rechtssatz



Other Use Cases

- Recent important Cases
- Legislation Versioning
- Monitoring Legislation

```
MATCH (n:Dokument)-[:zitiert]-  
  (d:Legislatur)  
<-[:voriger]-(f:Fassung) RETURN n,d,f
```



NLP – How it works

1. Texts are processed with NLP algorithms to identify parts of speech AND grammatical relationships
 - Noun (Kontaktrecht,Anspannung)
 - Adjective-noun (übereinstimmende Willenserklärung)
 - Noun-noun (Landesgericht Linz)
2. Stem/lemmatize and group terms with same meaning
3. Apply Statistical Measures tf/idf, Page Rank – weight based on text corpus
4. Include Legal Analysis (Entity/Citation Extraction)
5. Query Knowledge Graph and Fulltext Search Index
6. Recommend Documents

Use Cases:

Recommendation Engine, Semi-automated Keyword Annotation,
Natural Language Search

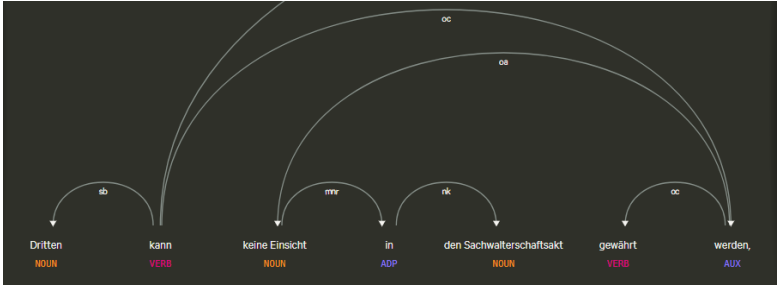
Use Case - Recommendation Engine

„Dritten kann keine Einsicht in den Sachwalterschaftsakt gewährt werden, auch wenn sie ein rechtliches Interesse darlegen. Ob eine Akteneinsicht ausnahmsweise möglich ist, wenn damit auch oder ausschließlich Interessen ... OGH 20. 12. 2017, 10 Ob 66/17d “

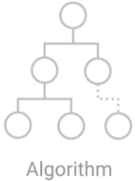


Data

NLP Tool



wheight	Stichwort	stemmed
6.766474258864097	Sachwalterschaftsakt	Sachwalterschaftsakt
4.469565623874856	rechtliches Interesse	rechtlich Interess
3.992706986104871	Akteneinsicht	Akteneinsicht
3.797996839904912	Einsicht	Einsicht
2.3292762460919443	Betroffenen	Betroff
1.0183138553717288	Interessen	Interess



Algorithm

Recommendations

Gefundene Zitate

10 Ob 66/17d



Vorschläge


score	cite/link
1.2718205	Zak 2015/593
1.24423	Zak 2018/202
1.0921924	Zak 2013/572
1.0860722	Zak 2018/152
1.0582126	OGH Entscheidungstext vom 28.11.2017 9Ob66/17x
0.9415373	JBI 2015, 597



Use Case - Natural Language Search

Lexis Answers

Results for: What is the statute of limitations for medical malpractice?  Actions 

Clear 

Medical malpractice Showing 1 of 3 | [Next](#)

The statute of limitations, [28 U.S.C.S. § 2401\(b\)](#), bars a claim for medical malpractice unless it is presented within two years after such claim accrues.

Read more at: [▲ Sexton v. United States, 832 F.2d 629](#)

U.S. Federal | US Court of Appeals for the D.C. Circuit | Nov 6, 1987

Is this information helpful?

ROSS Intelligence

 When is secondary liability with respect to copyright infringement established?

Cases (10,000+)



1. [▲ Landis v. Physicians Ins. Co. of Wis., Inc.](#)
Supreme Court of Wisconsin | Jul 03, 2001 | 2001 WI 86

2. [▲ In re Medical Review Panel for Claim of Moses](#)

 **Blank Productions, Inc. v. Warner/Chappell Music, Inc.**
S.D.N.Y. | January 2, 2013 | 11 Civ. 7927 (KMW)

" Secondary liability for copyright infringement may be imposed where a party has not committed direct infringement, but nonetheless played a significant role in direct infringement

- Innovation and Technology must serve the User
- Converting Data into Knowledge is a complex Task
- Our Solutions are never ,done‘

- It's worth it