Technische Universität München

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Semantic Analysis of Contracts and Claims in the Insurance Industry

Benjamin Storz, 4 May 2015

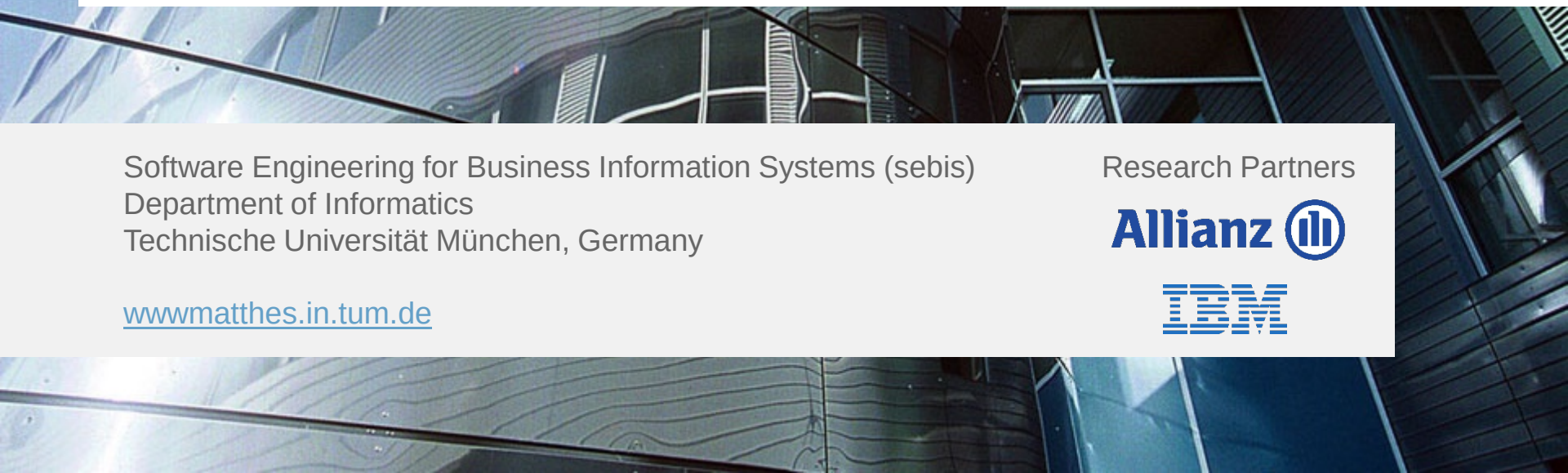
Software Engineering for Business Information Systems (sebis)
Department of Informatics
Technische Universität München, Germany

wwwmatthes.in.tum.de

Research Partners

Allianz

IBM



Organization

Chair: sebis
Supervisor: Prof. Dr. Florian Matthes
Advisor: Bernhard Waltl
Student: Benjamin Storz

Advisors: Michael Eitelwein,
Daniela Schneider
Group Organization Engineering
Disruptive Technologies

Advisor: Dr. Armin Rudert
IBM Watson Content
Analytics

Agenda

1. Problem Statement & Motivation
2. Research Questions
3. Research Method & Approach
4. Background Information
5. Project Plan

1. Problem Statement

Business Context

- Claim handling is a **high volume, time consuming** and **manual process**
- Claims need to be **read** by the **claims officer** and **checked** against the **Terms and Conditions (T&Cs)** included in the insurance contract of the policy holder
- Currently **~90 %** of **claims** are sent by means of **written documents**[1]

Problem Statement

- There is currently **no solution available** that **supports the claims officer** to **check whether** the **claim is covered or not**
- It is currently not possible to **use content analytics to extract exclusions, insured entities, benefits**,… from the **written T&Cs** and **populate a model** that can be used to support the coverage decision process within claims handling

[1] Source: Information provided by Allianz global claims management experts stated that only 10 % of claims are delivered fully digital to the drebis electronic claims management platform

1. Problem Statement
Current Claim Management Process

Claim documents (written text)

Lawyer	1	• Claims sent by the Lawyer requesting coverage for a client • Documents contain relevant information (policy holder, claimant, claim description, request for coverage,…)
Claims officer	2	• Creates a new claim in Allianz Business System (ABS)
Claims officer	3	• Reads all claim documents and follows an implicit checklist to collect all relevant information from the claim • Enters all identified information from the claim in ABS
Claims officer	4	• Checks the claims for a few standard exclusions (T&Cs), checks based on training documents and other Allianz guidelines • If all relevant information is available the officer decides to approve or decline
Lawyer	5	• The lawyer gets a written document with the description of the decision for the claim

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1. Motivation

Providing a **concept and prototypical artefacts** that utilize **content analytics** and **semantic web technologies** to **extract and enrich information** from **T&Cs** and offering this in a **computationally processible** representation.

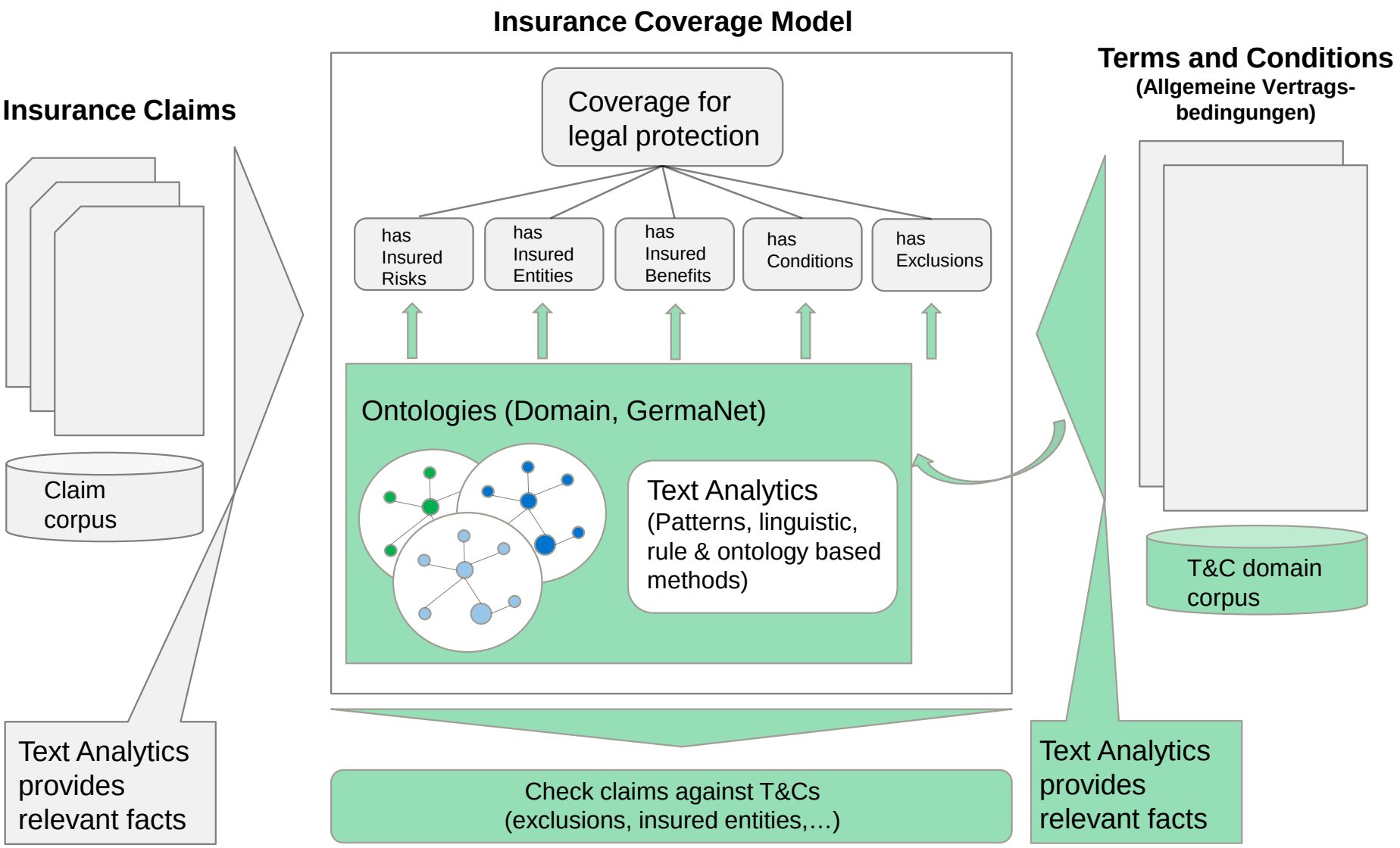
Business Drivers

- **Reduction** of claim **processing time** by matching claims to T&Cs (optimized & fast service)
- **Improve** the **quality** of checking by covering more T&Cs (more objective & reproducible)
- **Reduction** of **operational cost** for claims management (reduction of manual effort)

Technological Drivers

- Recent technological developments in the area of **content analytics** provide **new capabilities** to **extract unstructured information** and **support** the **decision process** (e.g. Watson Content Analytics, Apache UIMA)
- **Semantic web technologies** and **ontologies** provide a powerful way to create a model that can be **processed computationally**
- **Linguistic**, **statistical** and **rule based methods** offer capabilities for **extraction** and **matching** of concepts

1. Motivation



2. Research Questions

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Research Question 1:

- **How** are the selected **insurance contracts structured** by its T&Cs?
  - How does the structure of the T&Cs match the given coverage model? (Adjustments?)
  - What are important concepts within the selected types of T&Cs?
  - Which approach is suitable to extract the main facts from each section?
  - How are concepts related to each other?

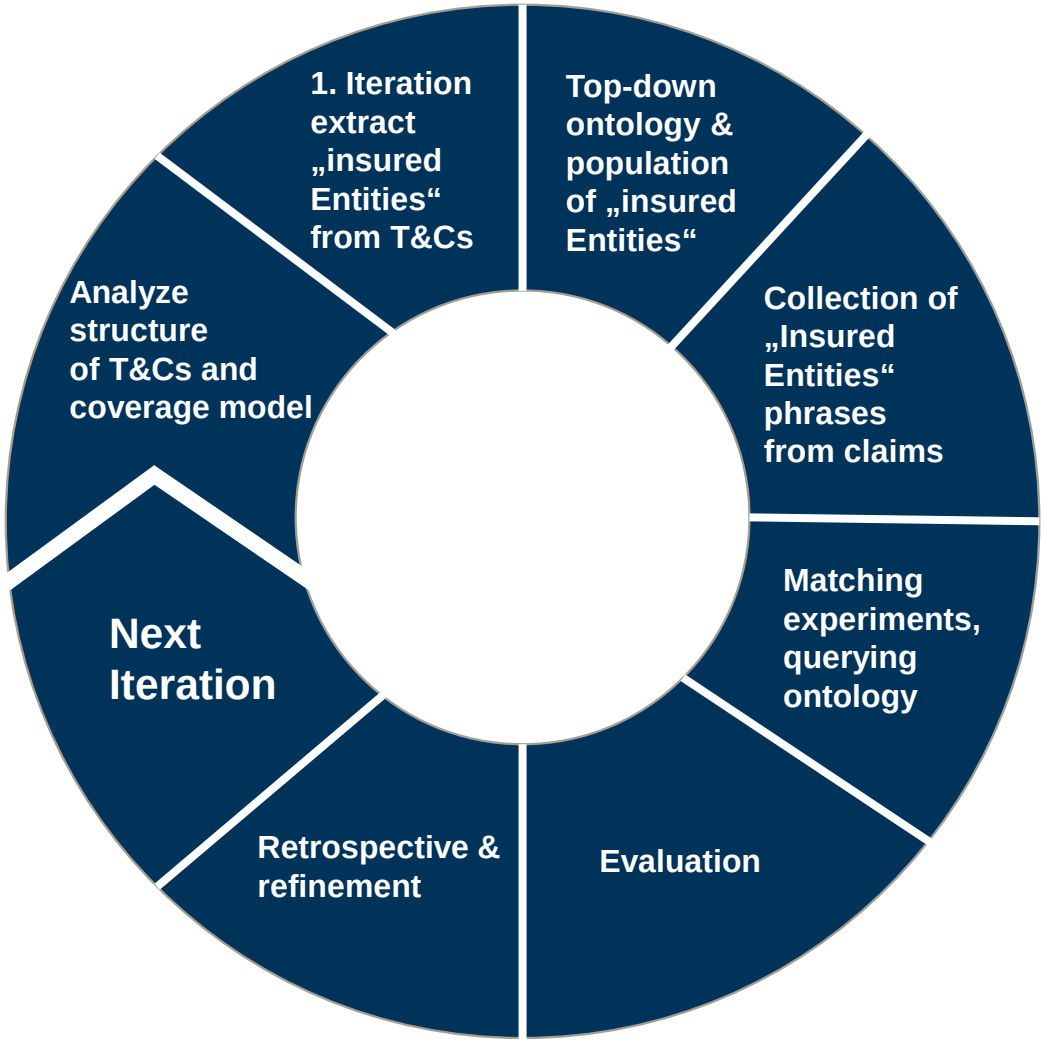
Research Question 2:

- **How** could a possible **top-down ontology** representing the **coverage model** be **populated** with the extracted exclusions, benefits,… from the T&Cs?
  - How can the classification be done?
  - Can the ontology be enriched with concept relations or other ontologies to improve the knowledge network

Research Question 3:

- Which **possibilities** exist to **match concepts** from a **claim** to those of the **coverage model**?

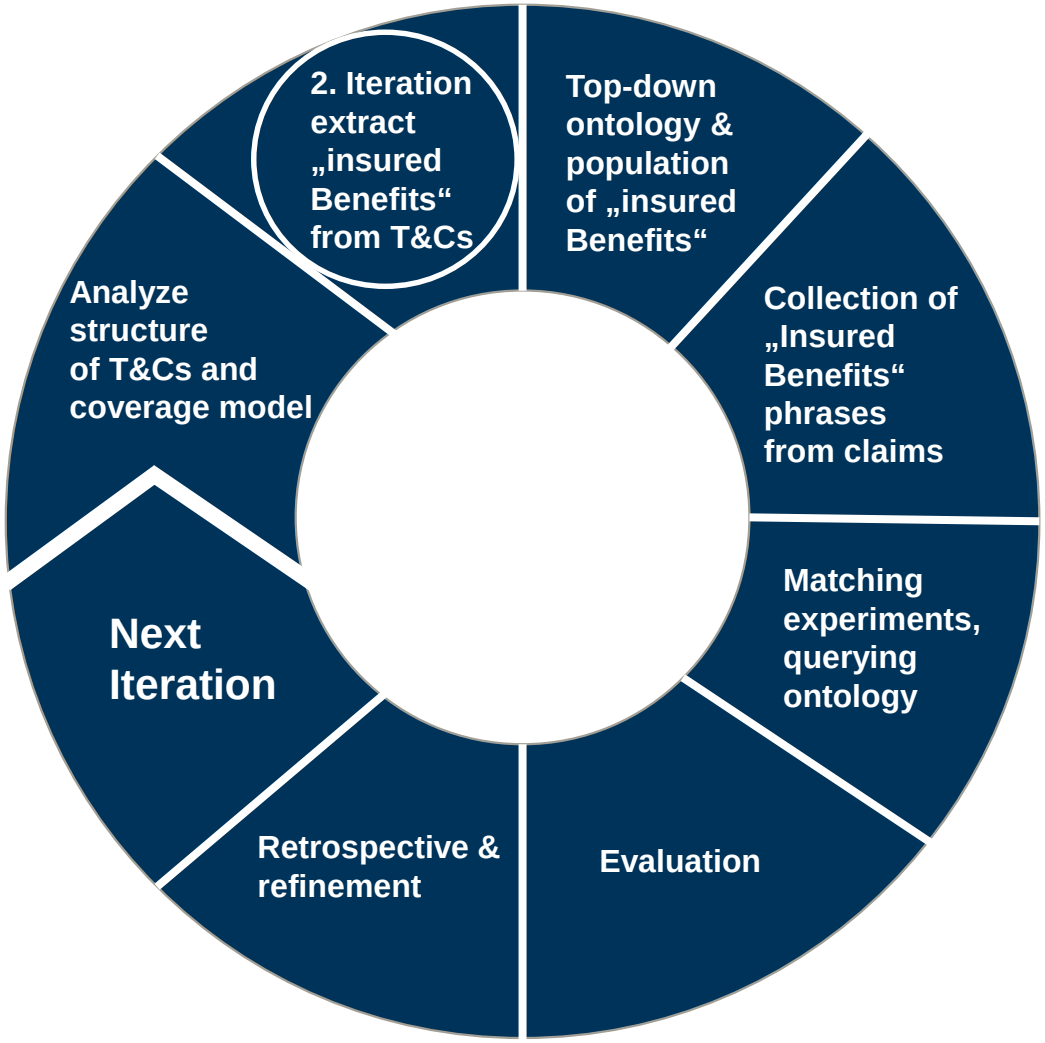
3. Research Approach



Data & **Information** provided by Allianz:

- 42 T&Cs from legal protection insurance area in textual form
- ~ 3000 anonymized claims in textual form
- Insurance coverage model
- Expert knowledge from claims officers about the claims management process

3. Research Approach



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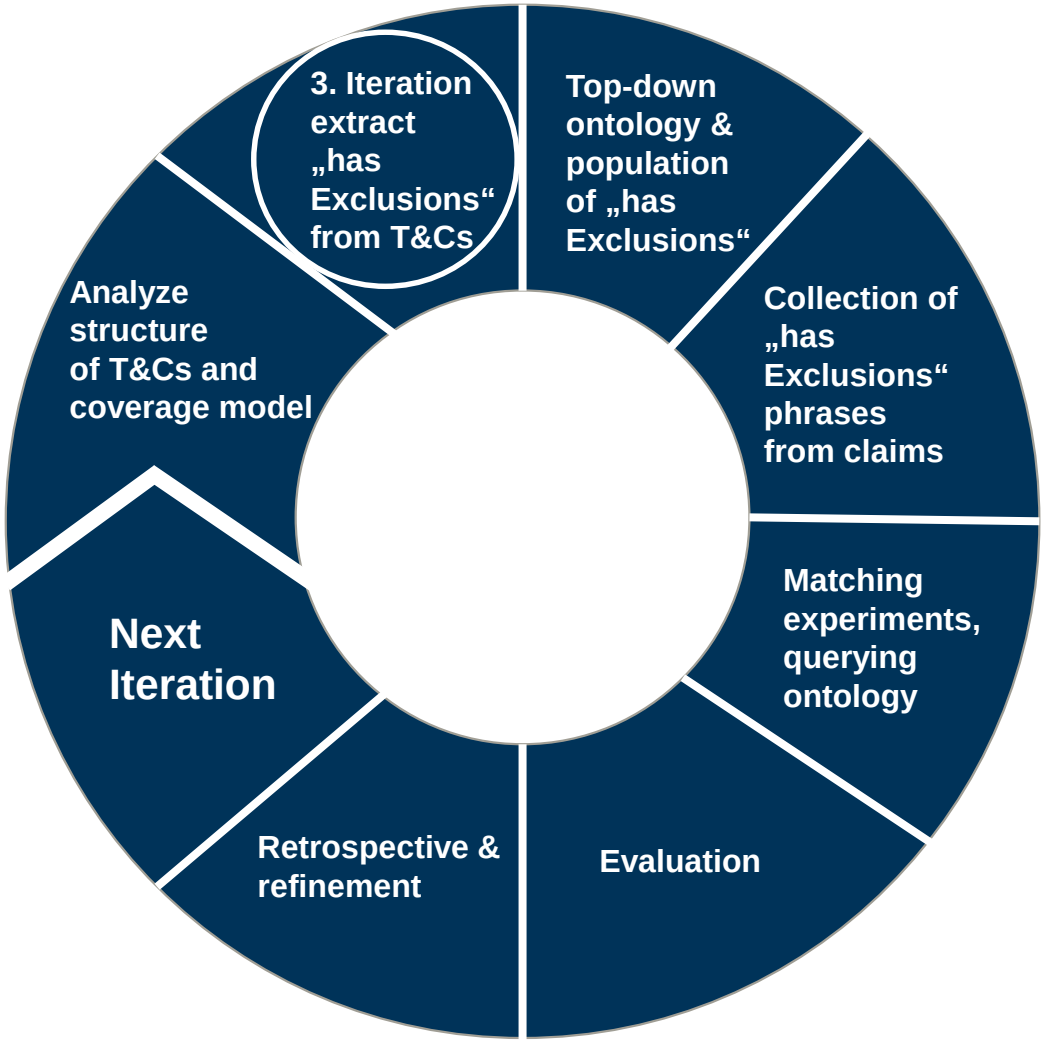

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4. Background information
Terms and Conditions – Legal Protection Insurance

Example: “Privat-, Berufs- und Verkehrs- Rechtsschutz” – Part 1 of 2

Document structure is consistent

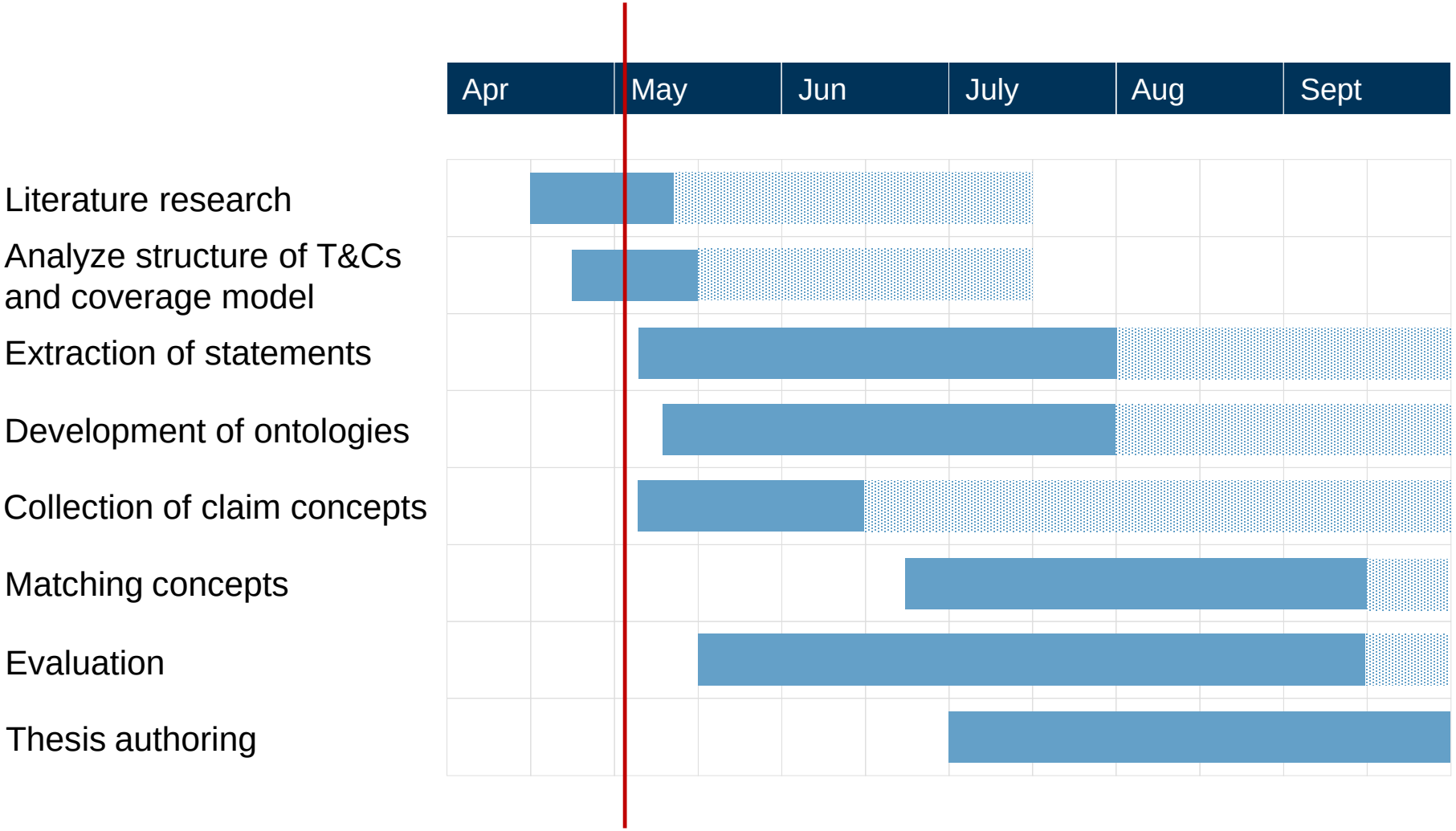
1. Leistungsvorraussetzungen und Leistungsumfang
    - 1.1. Welche Aufgaben hat die Rechtsschutzversicherung?
    - 1.2. Um welchen Rechtsschutz geht es?
    - 1.3. Wer und was ist versichert?
    - 1.4. Welche Personen sind mitversichert? Was gilt hinsichtlich der mitversicherten Personen?
    - 1.5. Welchen Umfang hat Ihr Versicherungsschutz (Leistungsarten)?
    - 1.6. Unter welchen Voraussetzungen haben Sie Anspruch auf Versicherungsschutz?
    - 1.7. Welche Leistungen erbringen wir nach Eintritt des Versicherungsfalles?
    - 1.8. Welche Rechte haben Sie bei der Auswahl und Beauftragung des Rechtsanwalts?
    - 1.9. In welchen Ländern haben Sie diesen Versicherungsschutz?
    - 1.10. Sanktionsklausel

4. Background information
Terms and Conditions – Legal Protection Insurance

Example: “Privat-, Berufs- und Verkehrs- Rechtsschutz” – Part 2 of 2

2. Leistungsausschlüsse und Leistungseinschränkungen
    - 2.1. Welche zeitliche Ausschlüsse gibt es?
    - 2.2. Welche inhaltliche Ausschlüsse gibt es?
    - 2.3. Welche Kosten sind nicht erstattungsfähig?
    - 2.4. Was gilt, wenn Sie den Versicherungsfall vorsätzlich herbeiführen?
    - 2.5. Wann können wir Rechtsschutz wegen mangelnden Erfolgsaussichten ablehnen?
    - 2.6. Welche Selbstbeteiligung gilt?
3. Ihre besonderen Obliegenheiten
4. Rangverhältnis der Leistungen bei mehreren Versicherungsverträgen
5. Risikowegfall
6. Weitere Regelungen zur Durchführung des Vertrages

5. Project Plan



Thank you for your attention!

Benjamin Storz

Technische Universität München
Department of Informatics
Chair of Software Engineering for
Business Information Systems

Boltzmannstraße 3
85748 Garching bei München

Tel +49.151.70030999

benjamin.storz@tum.de
wwwmatthes.in.tum.de

Backup

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Watson Content Analytics – NLP Pipeline

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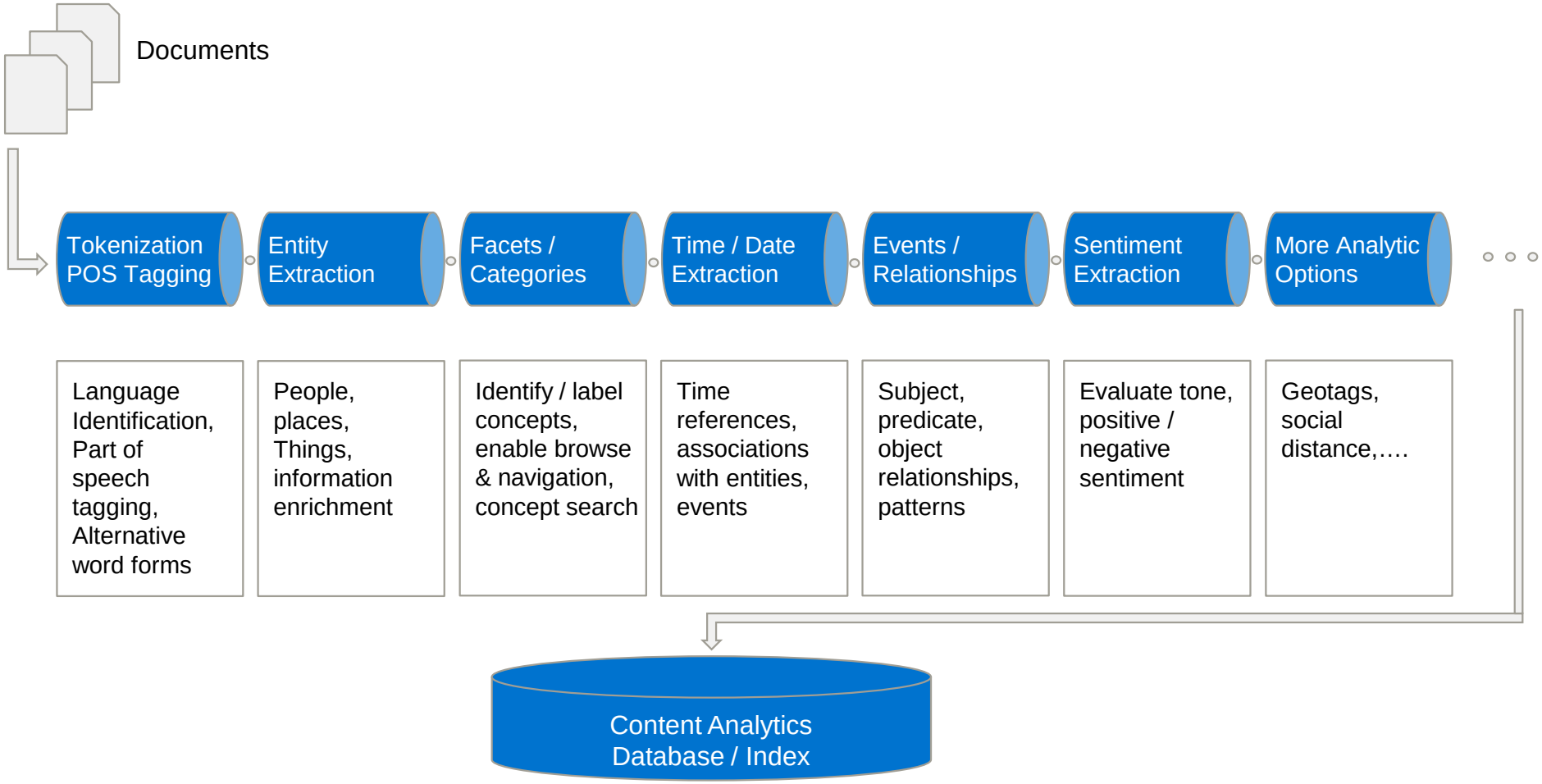
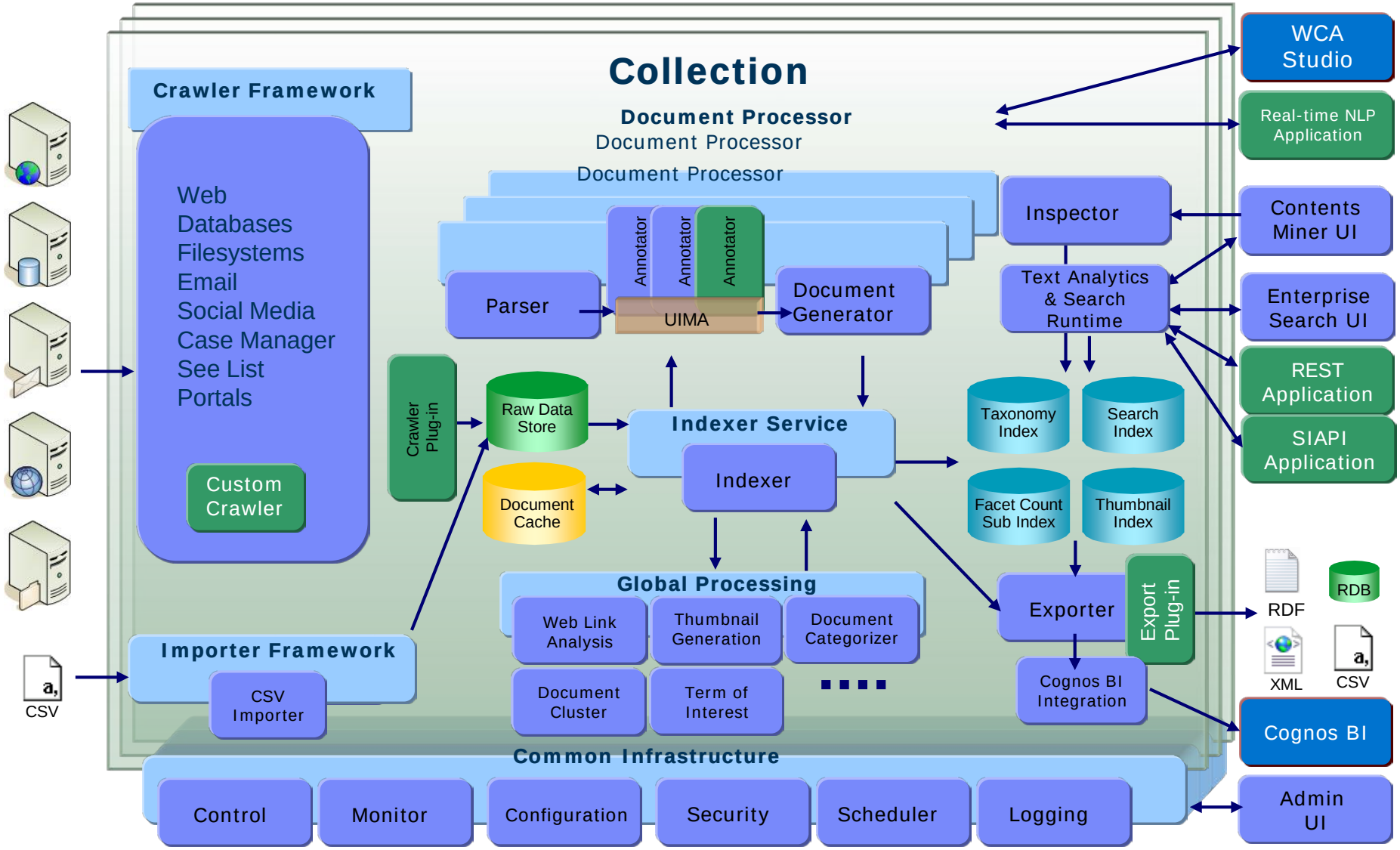
Overview of Watson Content Analytics – Language Processing Pipeline



Watson Content Analytics Architecture



Business Value – Semantic Outcome Matrix

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Business Value

Natural Language interface to access vast data volume

Answers to action

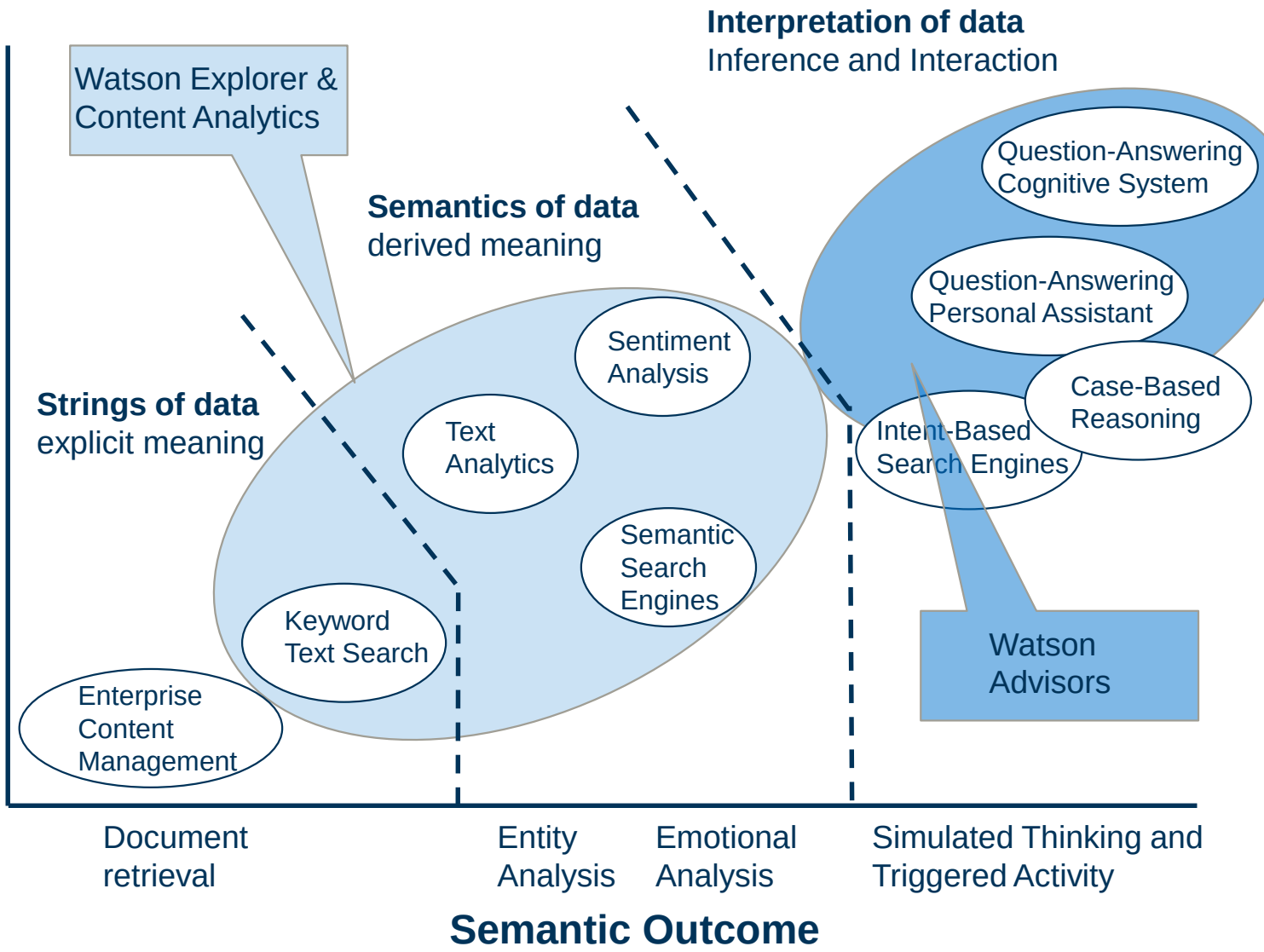
First-person commentary

Rapid content assessment

Rapid content assessment

Fast & high recall

High precision document search



Terms and Conditions
Legal Protection Insurance

Example: “Immobilien-Rechtsschutz für die selbstbewohnte Wohneinheit” – Part 1 of 2

1. Leistungsvorraussetzungen und Leistungsumfang
    1.1. Welche Aufgaben hat die Rechtsschutzversicherung?
    1.2. Um welchen Rechtsschutz geht es?
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Legal Protection Insurance

Example: “Immobilien-Rechtsschutz für die selbstbewohnte Wohneinheit” – Part 2 of 2

2. Leistungsausschlüsse und Leistungseinschränkungen
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