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Umsetzung von BI-Lösungen mit Unterstützung einer Suchmaschine

6. Workshop Open Source Business Intelligence

05.03.2015

Tobias Kraft, exensio GmbH

Agenda

- Suchmaschinen
- Elasticsearch
- BI-Stack mit Elasticsearch
- Umsätze Pharma

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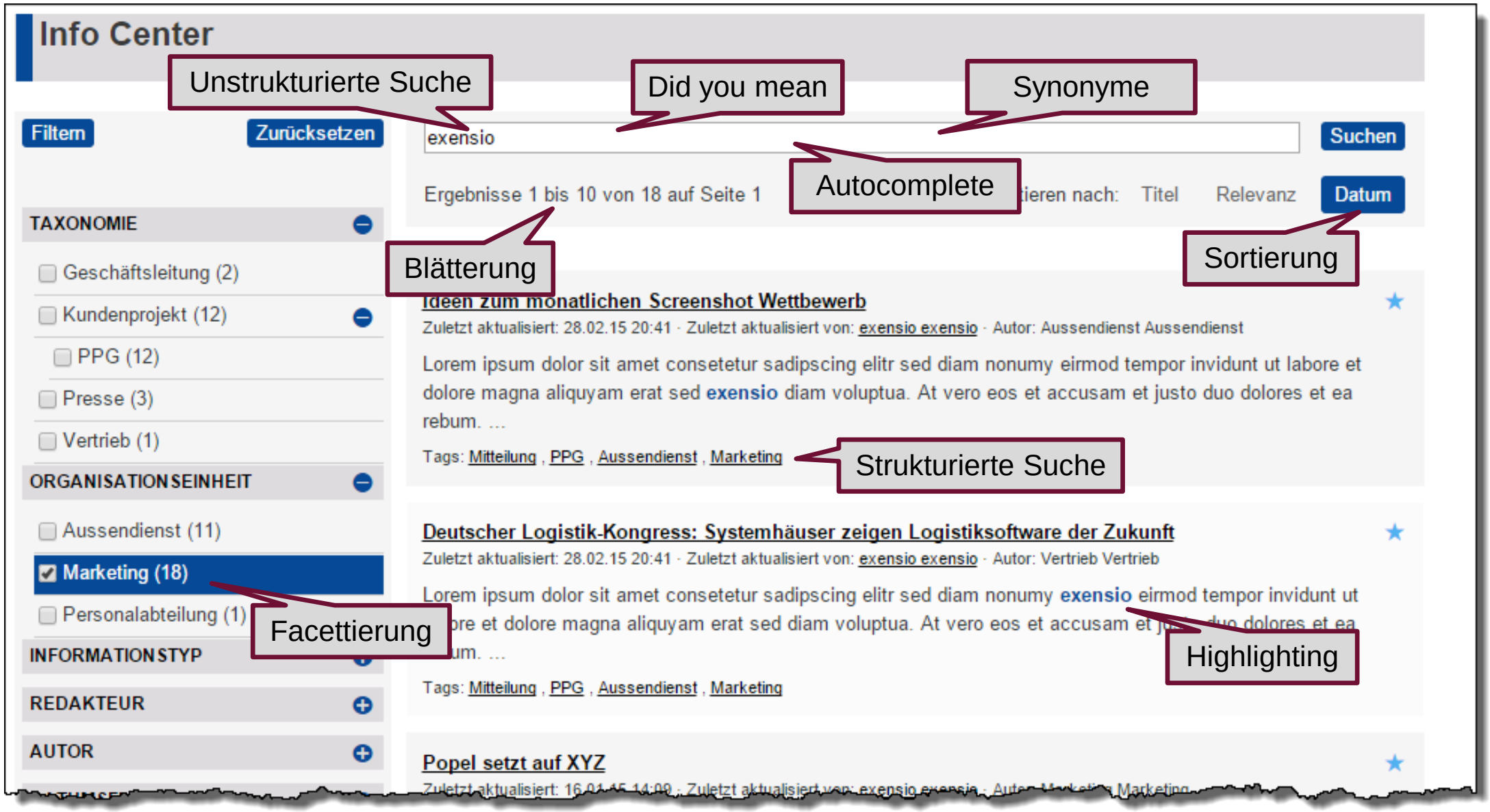
Funktionen einer Suche



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Für Suchmaschinen gibt es viele Einsatzszenarien

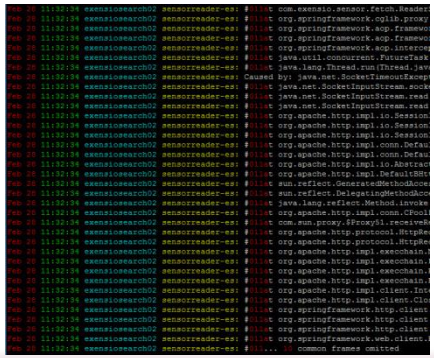
Speicher

Volltextsuche

Cache

Geo-Suche

Logfile-Analyse



Analytics

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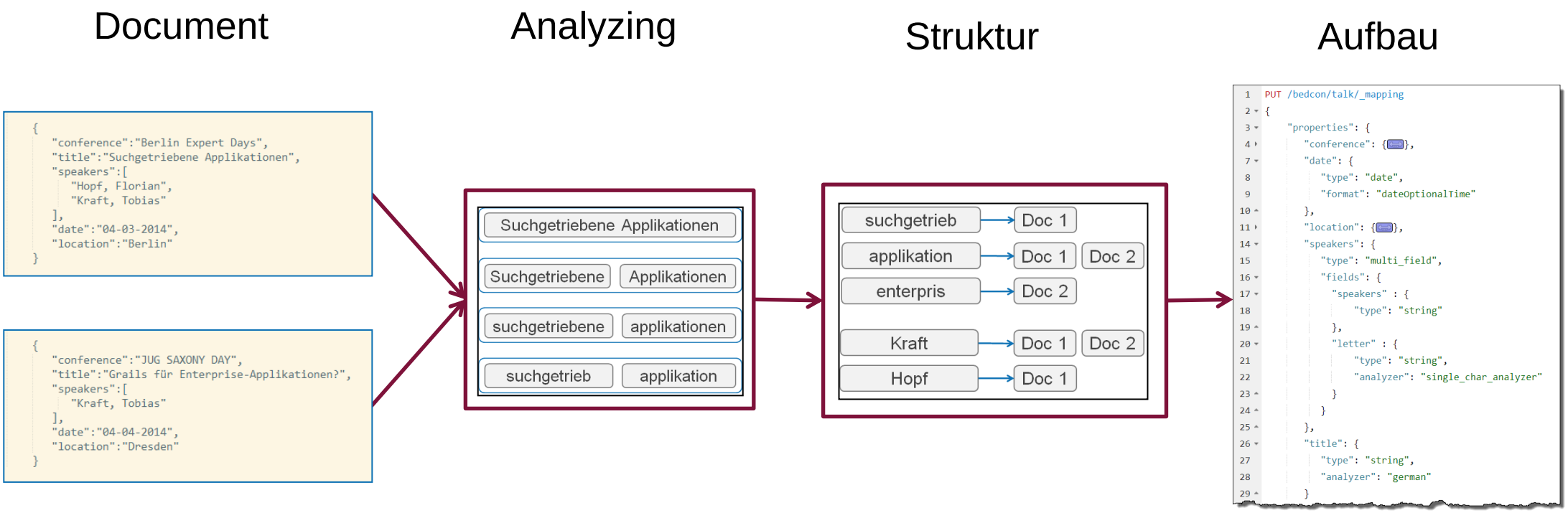
Speichern von Daten in einer Suchmaschine



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Elasticsearch im Überblick

- Suchmaschine unter Apache 2 Open Source License
- Erstes Release 2010

- Basiert auf Java
- Basiert auf Lucene

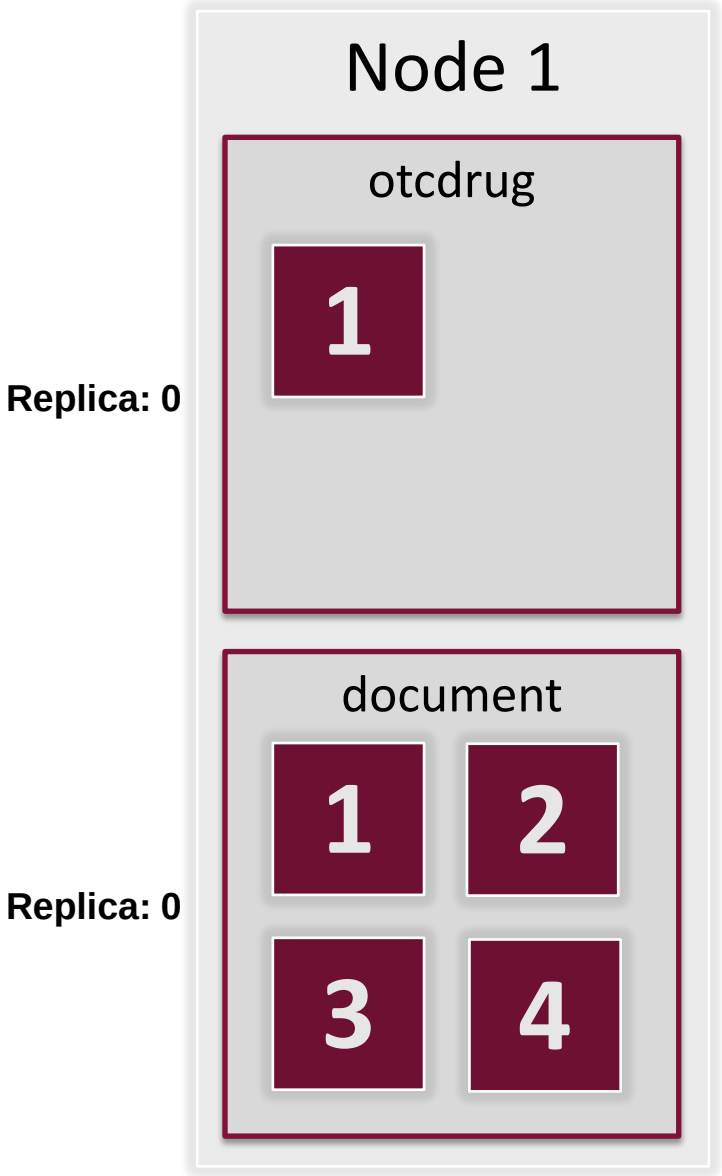
- JSON-API
- Schemalos
- Plugins

- Runterladen und loslegen
- Im Trend

```
GE
{
}
```

```
  "hits": {
    "total": 7124,
    "max_score": 0.66425383,
    "hits": [
      {
        "_index": "factmarket",
        "_type": "jdbc",
        "_id": "AUvW12UnPHK6qcGfww5-",
        "_score": 0.66425383,
        "_source": {
          "id": 42181,
          "version": 0,
          "aut_idem": null,
          "date_created": "2013-01-16T00:52
          "gross_sales": null,
          "last_updated": "2013-01-16T00:52
          "launch_revenues0": null,
          "launch_revenues1": null,
          "market_gen_launches0": null
```

Große Datenmengen über Shards verwalten



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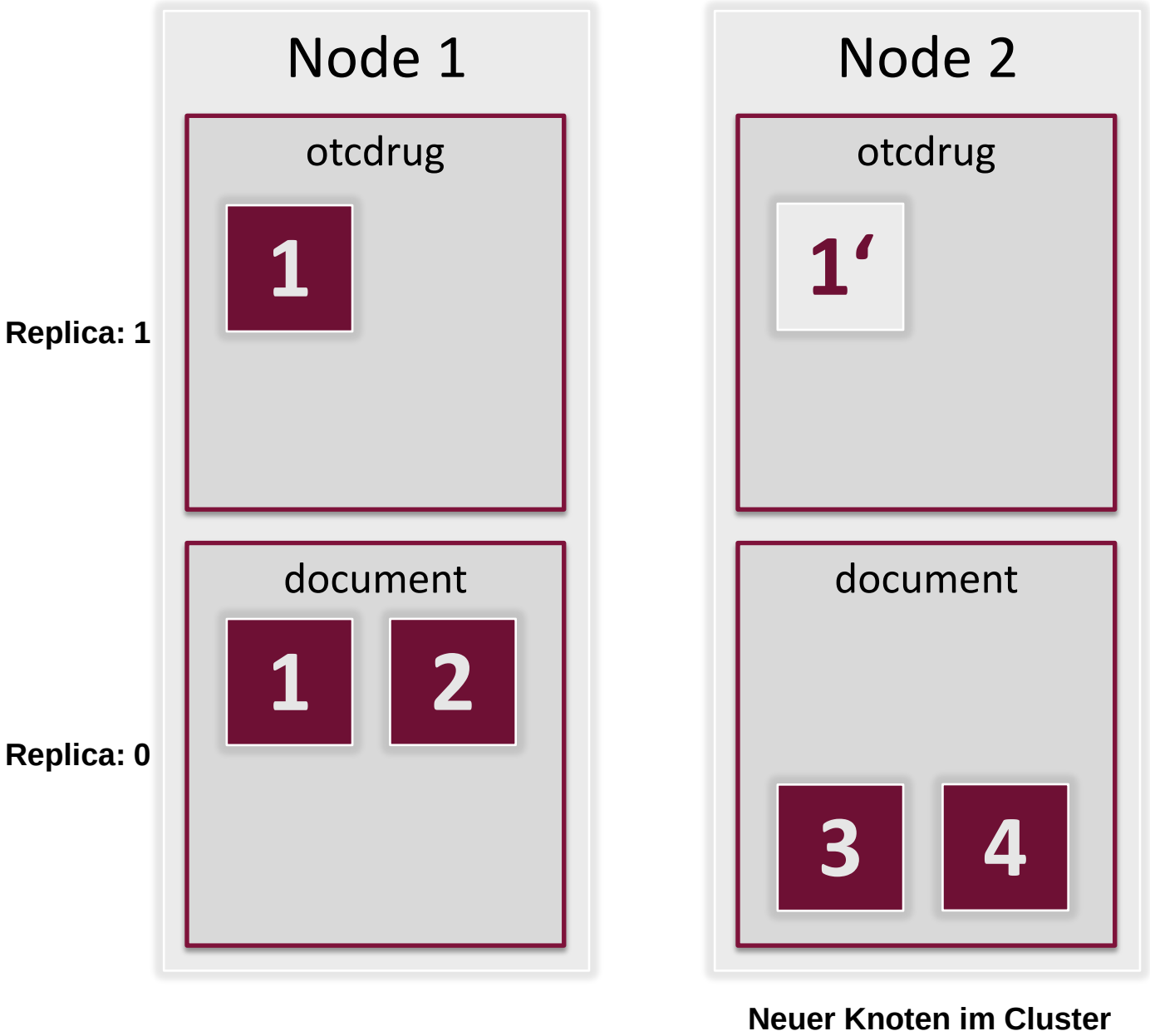
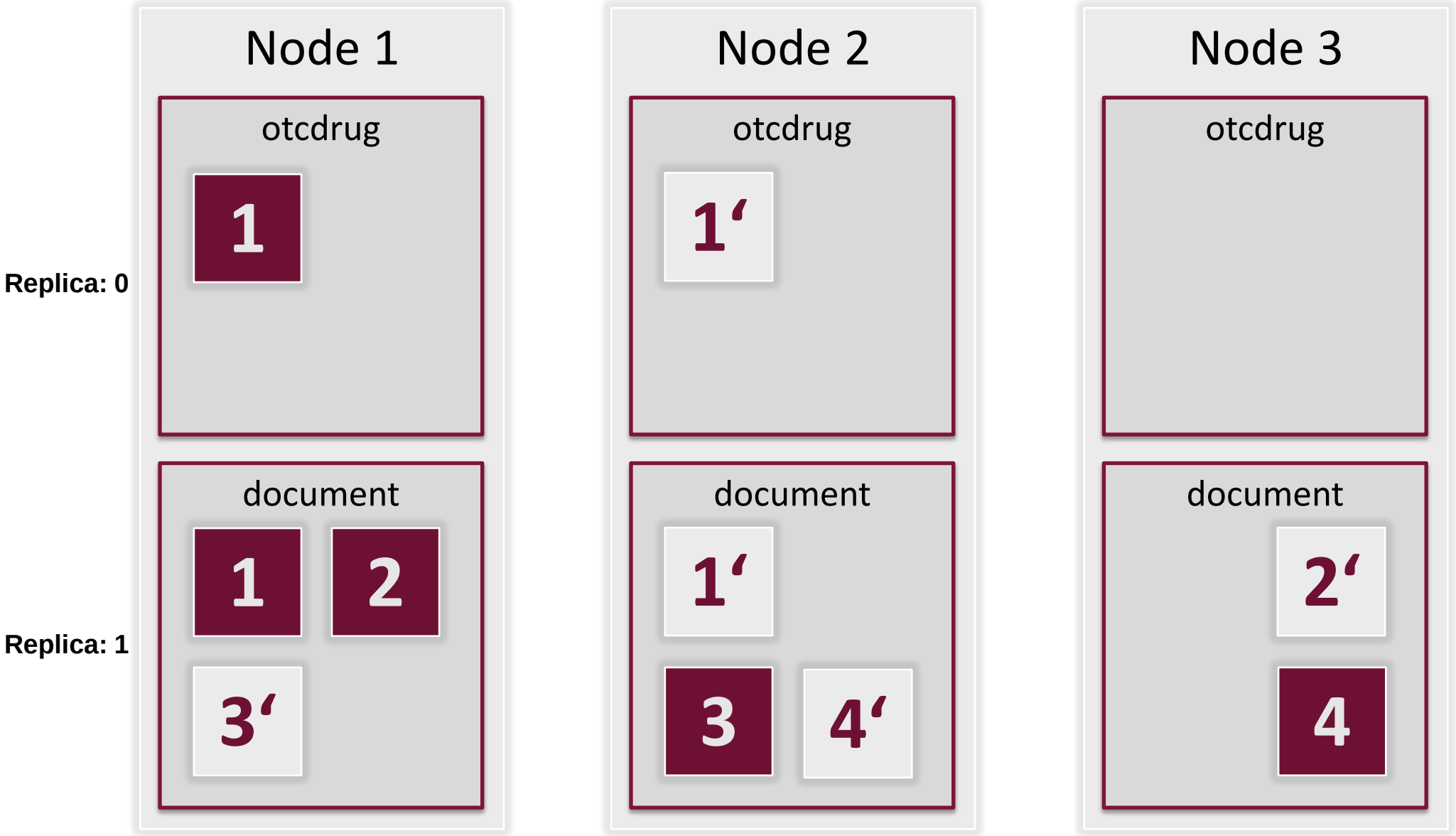
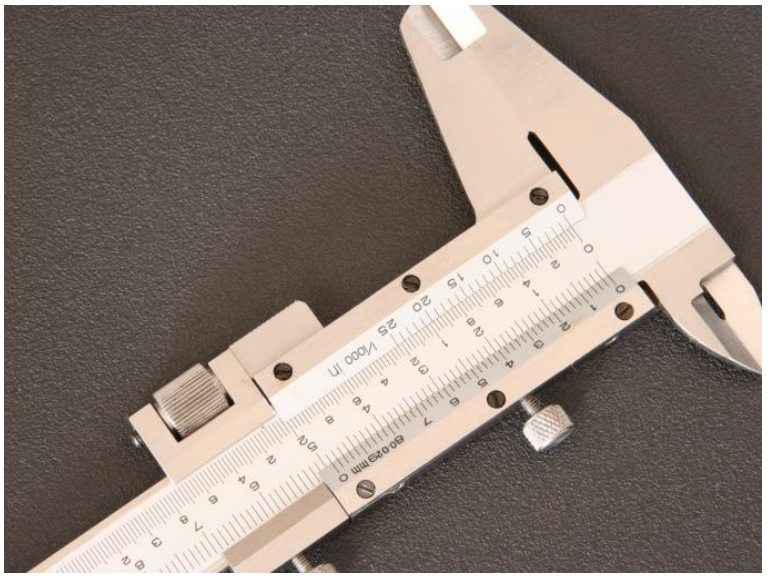


Große Datenmengen über Shards verwalten



Aggregationen - Buckets und Metrics

http://mrg.bz/lQNZFq



http://mrg.bz/Nn57cJ

Buckets

- Terme
- Ranges
- Histograme
- Geo-Distanz

Metrics

- Anzahl
- Summe
- Min / Max / Average
- Varianz
- Perzentile

Aggregationen für Analysen

```
POST /events/_search
{
  "aggs" : {
    "categories" : { "terms" : { "field" : "category" } },
    "indications" : { "terms" : { "field" : "indication" } },
    "locations" : { "terms" : { "field" : "location" } },
    "countries" : { "terms" : { "field" : "country" } },
    "created_range": {
        "date_range": {
            "field": "created",
            "format": "yyyy-MM-dd'T'HH:mm:ss.SSSZ",
            "ranges": [
                { "from": "now-1M/M" },
                { "from": "now-3M/M" },
                { "from": "now-6M/M" }
            ]
        }
    }
  }
}
```

Aggregationen

```
POST /even
{
  "aggs" :
    "categ
    "indic
    "locat
    "count
    "creat
        "d
        }
    }
  }
}
```

```
  "aggregations": {
    "locations": {
      "buckets": [
        {
          "key": "Berlin",
          "doc_count": 626
        },
        {
          "key": "Basel",
          "doc_count": 93
        },
        .....
      ]
    },
    "countries": {
      "buckets": [
        {
          "key": "Germany",
          "doc_count": 671
        },
        {
          "key": "Switzerland",
          "doc_count": 107
        },
```

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BI mit Elasticsearch

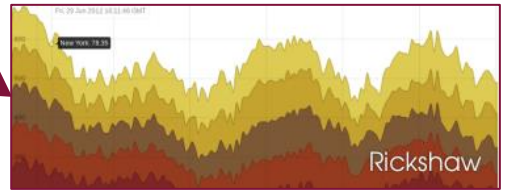
ETL | **Speicherung / Berechnungen** | **Analyse**

Logstash

rivers

Implementierungen für
- JDBC
- CSV
- …

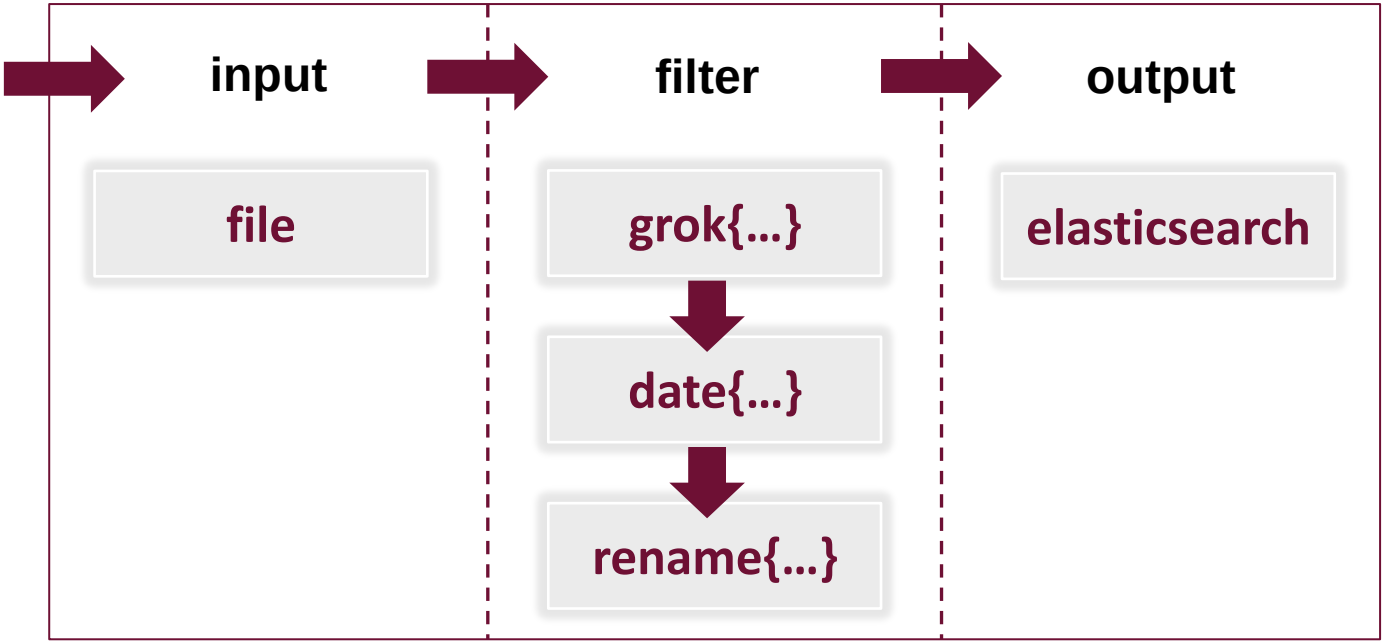
Eigene Loader mit
ES-Client (Bsp. SpringBoot)



Eigene Visualisierung

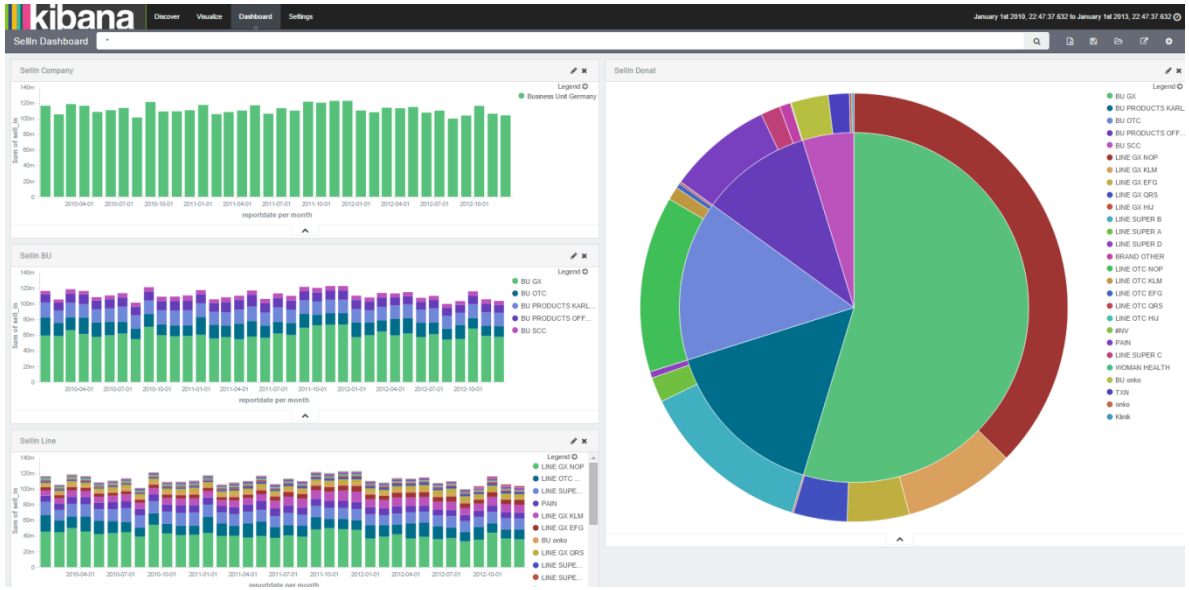
Datentransport mit Logstash

- Event Processing Engine
- Optimiert für Log-Dateien
- Pipeline-Prinzip
  - Input (50+)
  - Filter (60+)
  - Output (75+)



Visualisierungen mit Kibana

- Aktuelles Release: Kibana 4
- Browserbasierte Visualisierung von Daten
  - Abfragen über JSON an ES
- Aufbereitung über
  - Discover
  - Visualize
  - Dashboards



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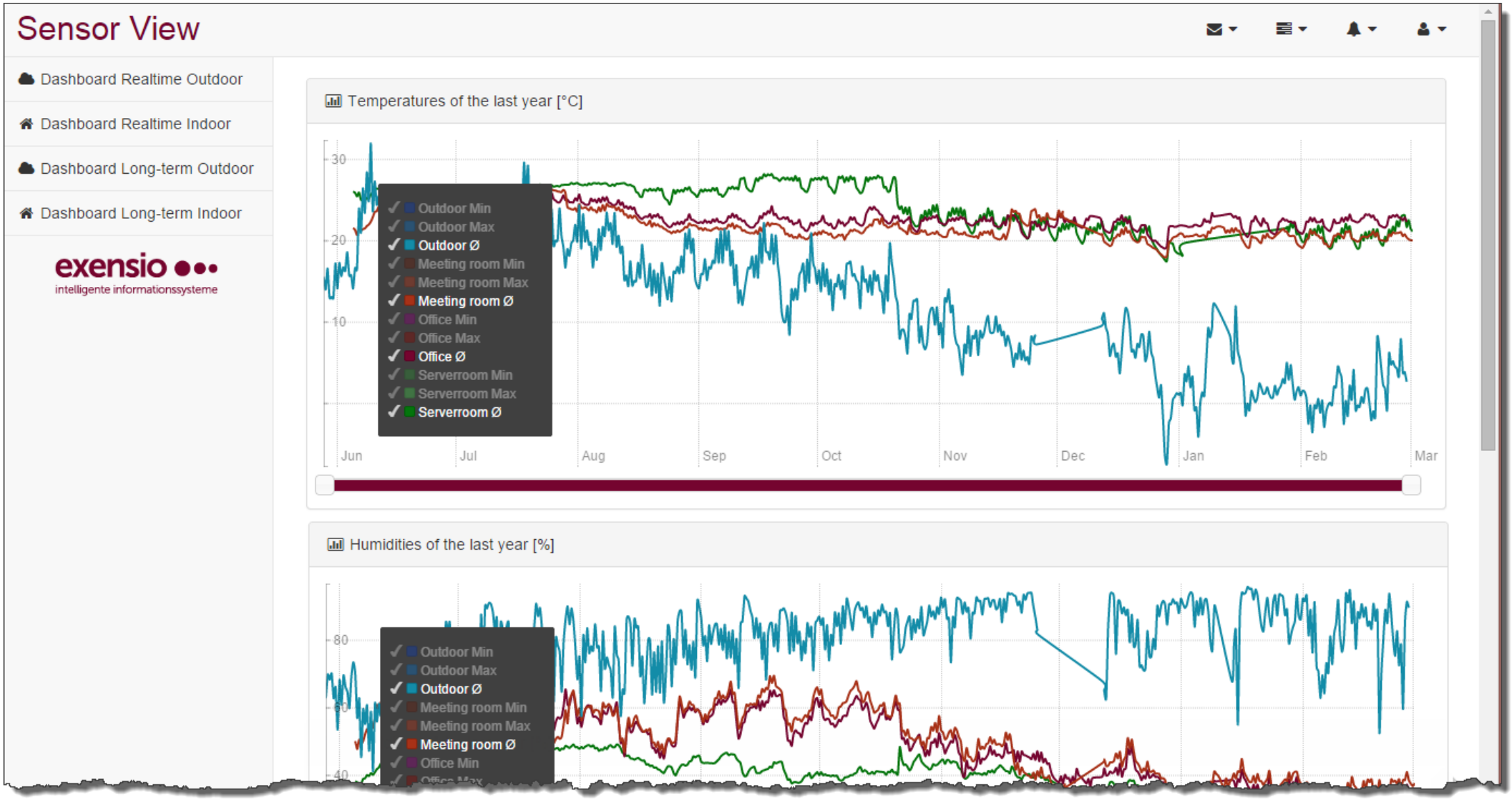
Eigene Analyse-Komponenten sind einfach zu erstellen



Darstellung der JSON-Rückgabewerte von ES auf Basis von JavaScript

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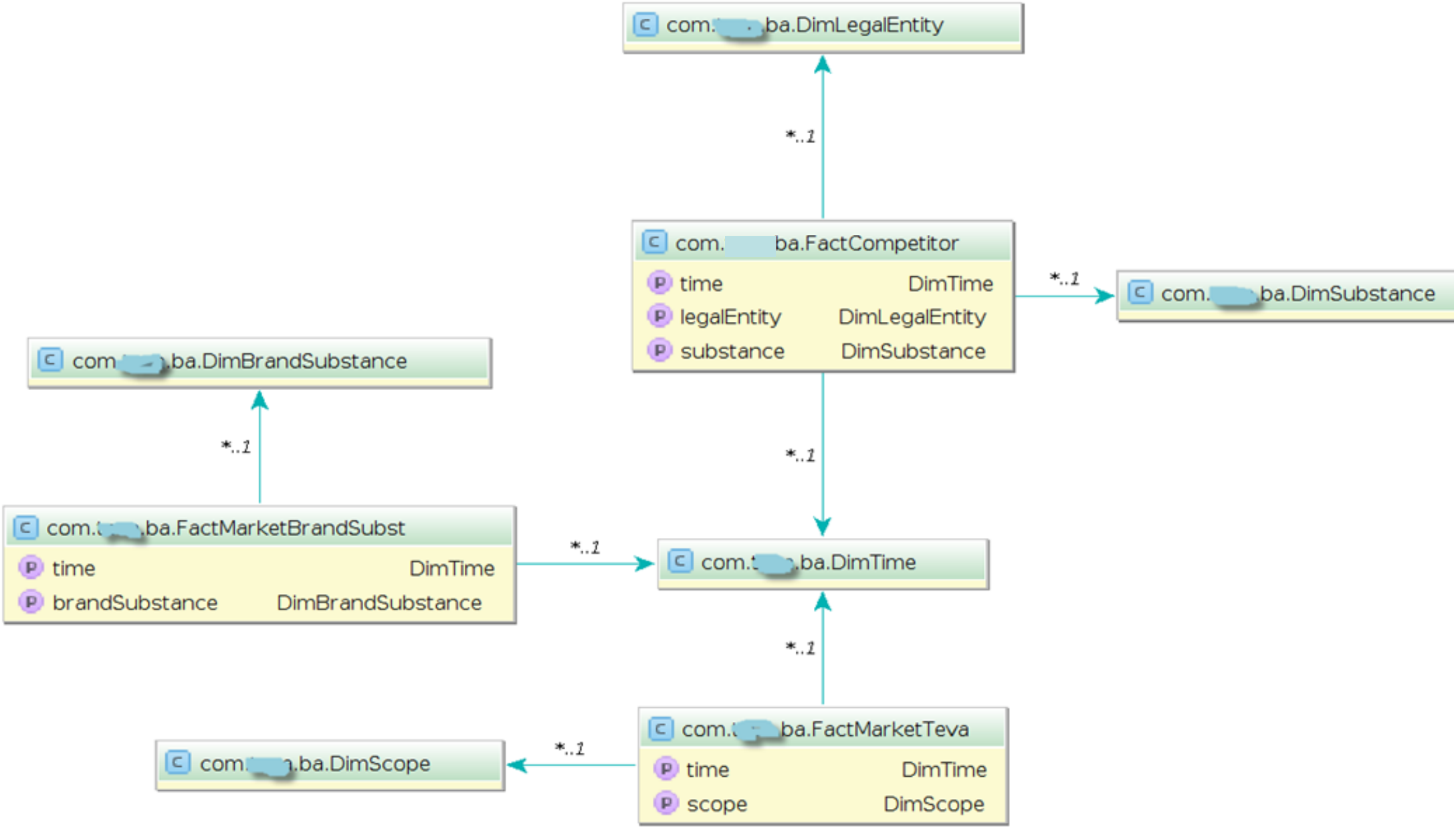
Marktanalysen Pharmamarkt – Starschema



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Marktanalysen Pharmamarkt – Suchmaschine

```
{
   "factmarket": {
      "mappings": {
         "market": {
            "properties": {
               "aut_idem": {
                  "type": "double"
               },
               "bu": {
                  "type": "string",
                  "index": "not_analyzed"
               },
               "company": {
                  "type": "string",
                  "index": "not_analyzed"
               },
               "reportdate": {
                  "type": "date",
                  "format": "dateOptionalTime"
               },
               "id": {
                  "type": "long"
               },
               "level": {
                  "type": "long"
               },
               "line": {
                  "type": "string",
                  "index": "not_analyzed"
               },
               "market_gen_launches0": {
                  "type": "double"
               },
               "market_gen_launches1": {
                  "type": "double"
               },
               "market_launches0": {
                  "type": "double"
               },
               "market_launches1": {
                  "type": "double"
               },
               "market_sell_out": {
                  "type": "double"
               },
               "market_vo_aut_idem": {
```

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Marktanalysen Pharmamarkt – Suchmaschine

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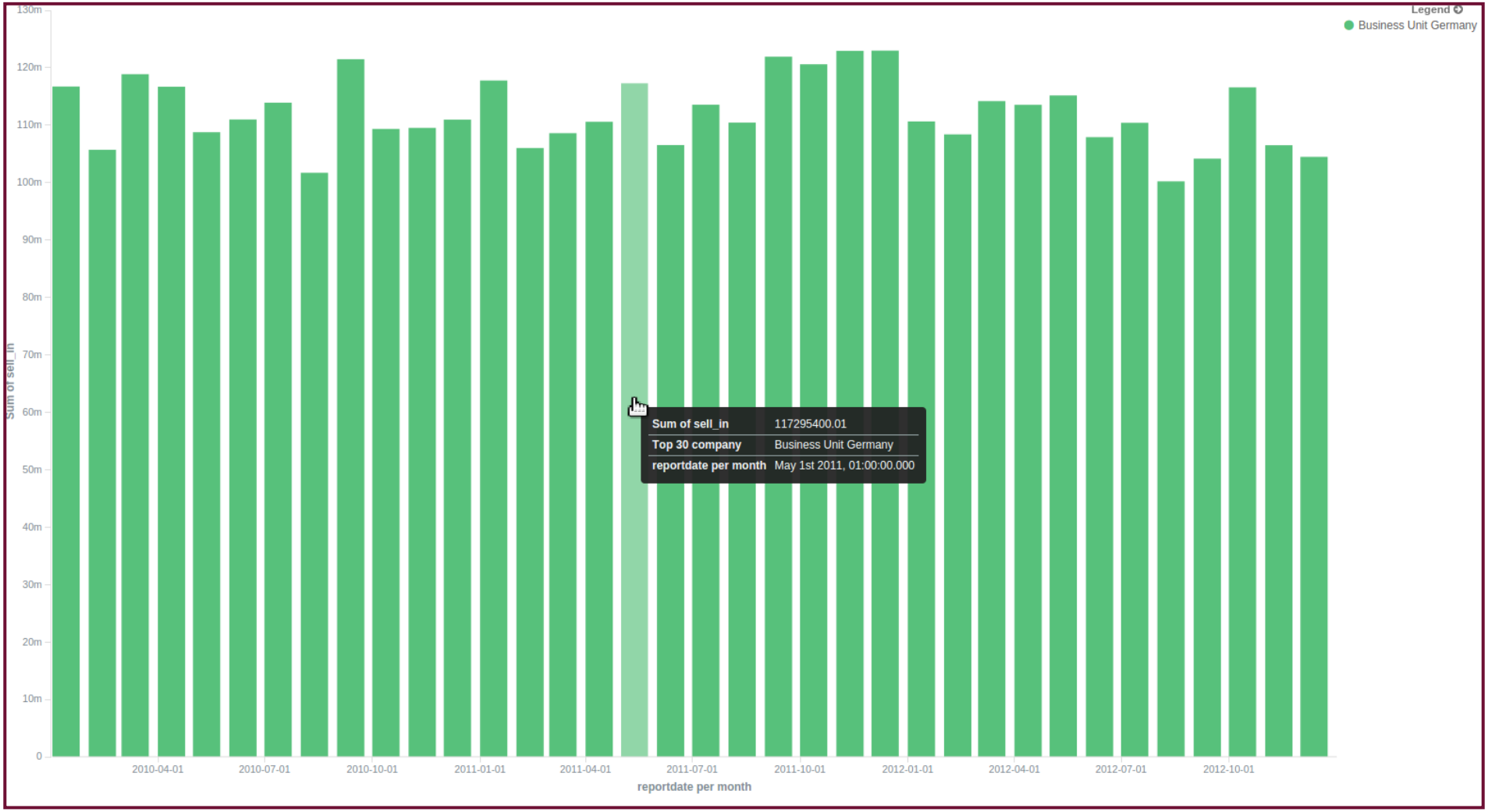
DrillDown des SellIn von Firma, Business Unit und Linie



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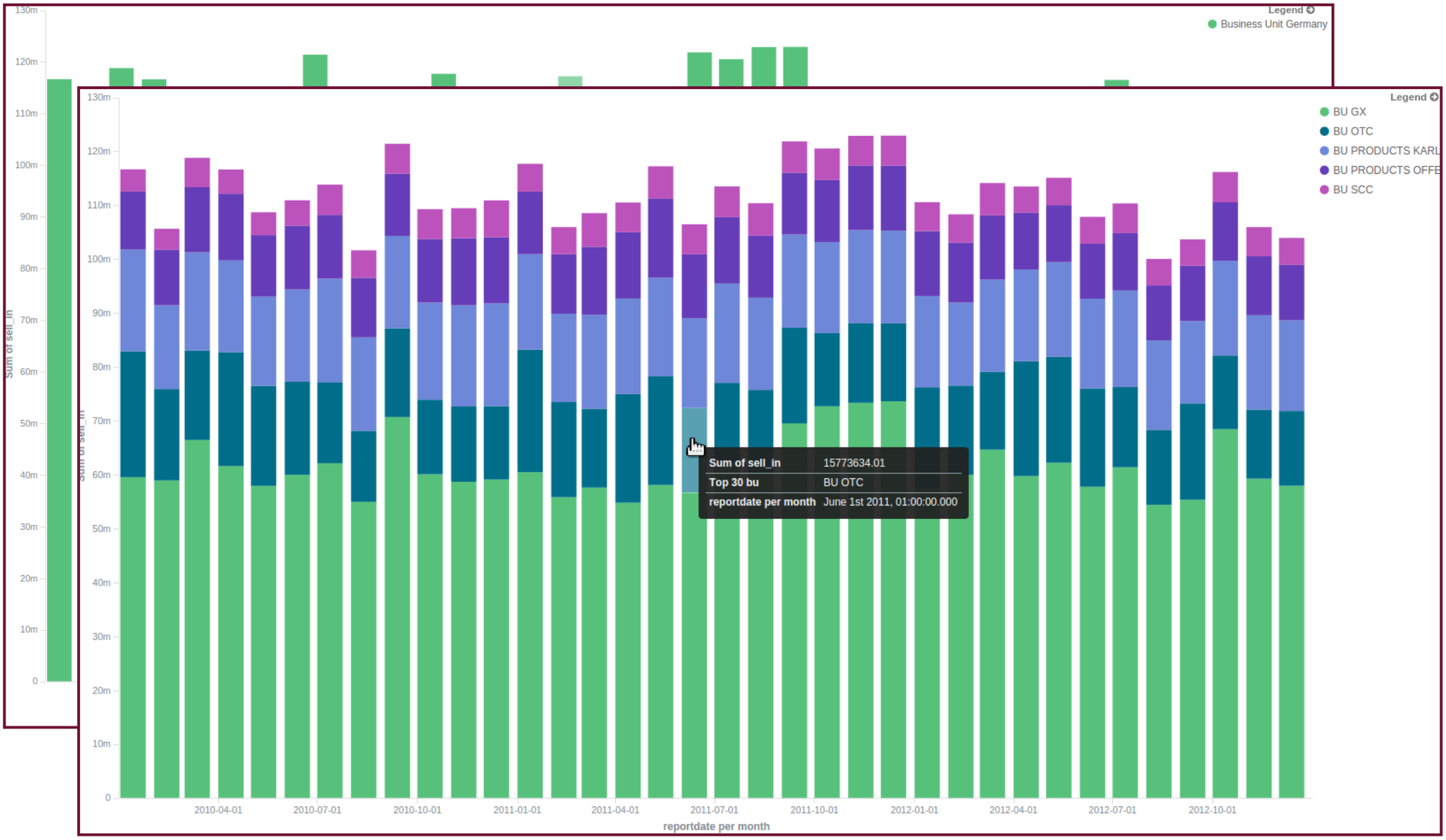
DrillDown des SellIn von Firma, Business Unit und Linie



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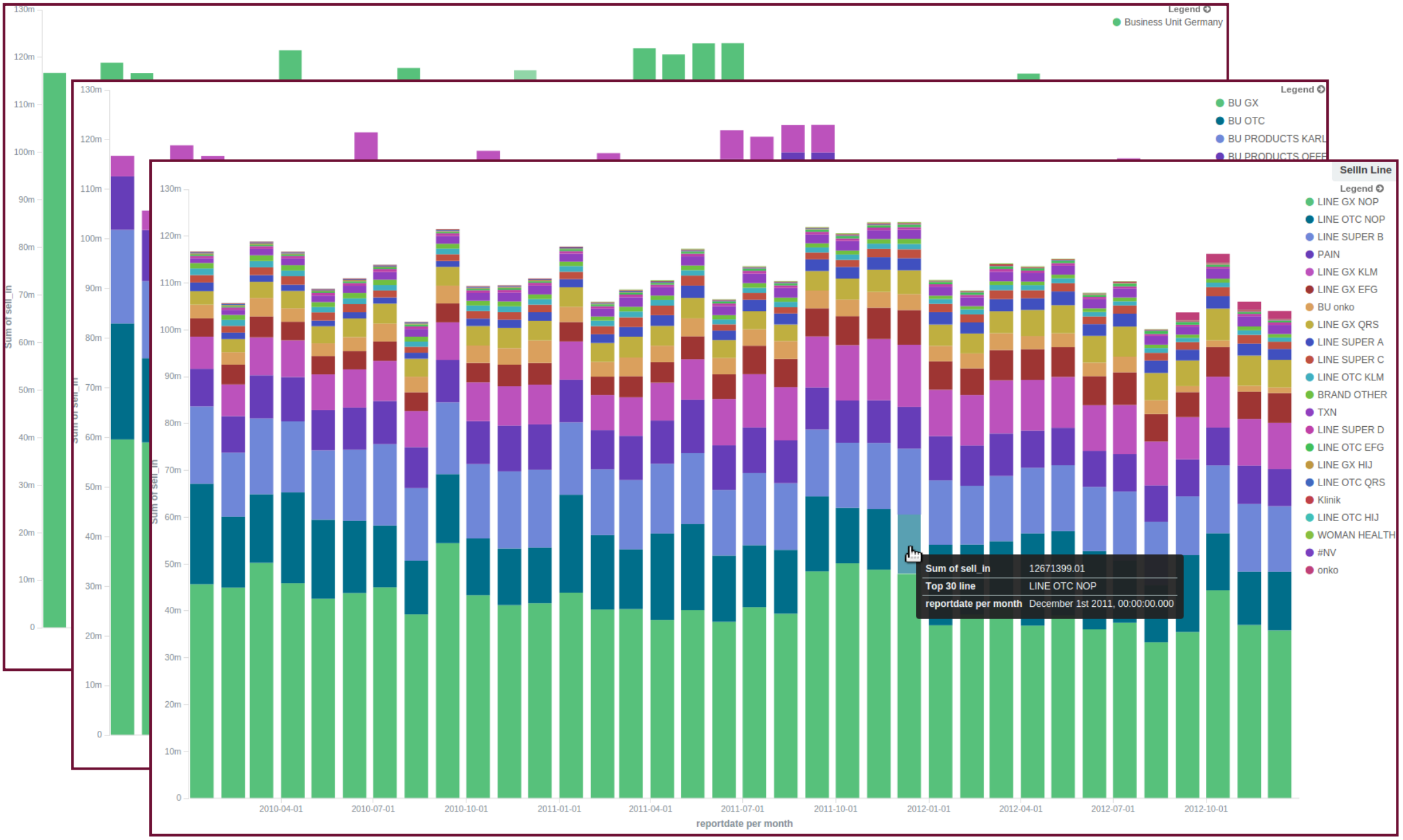

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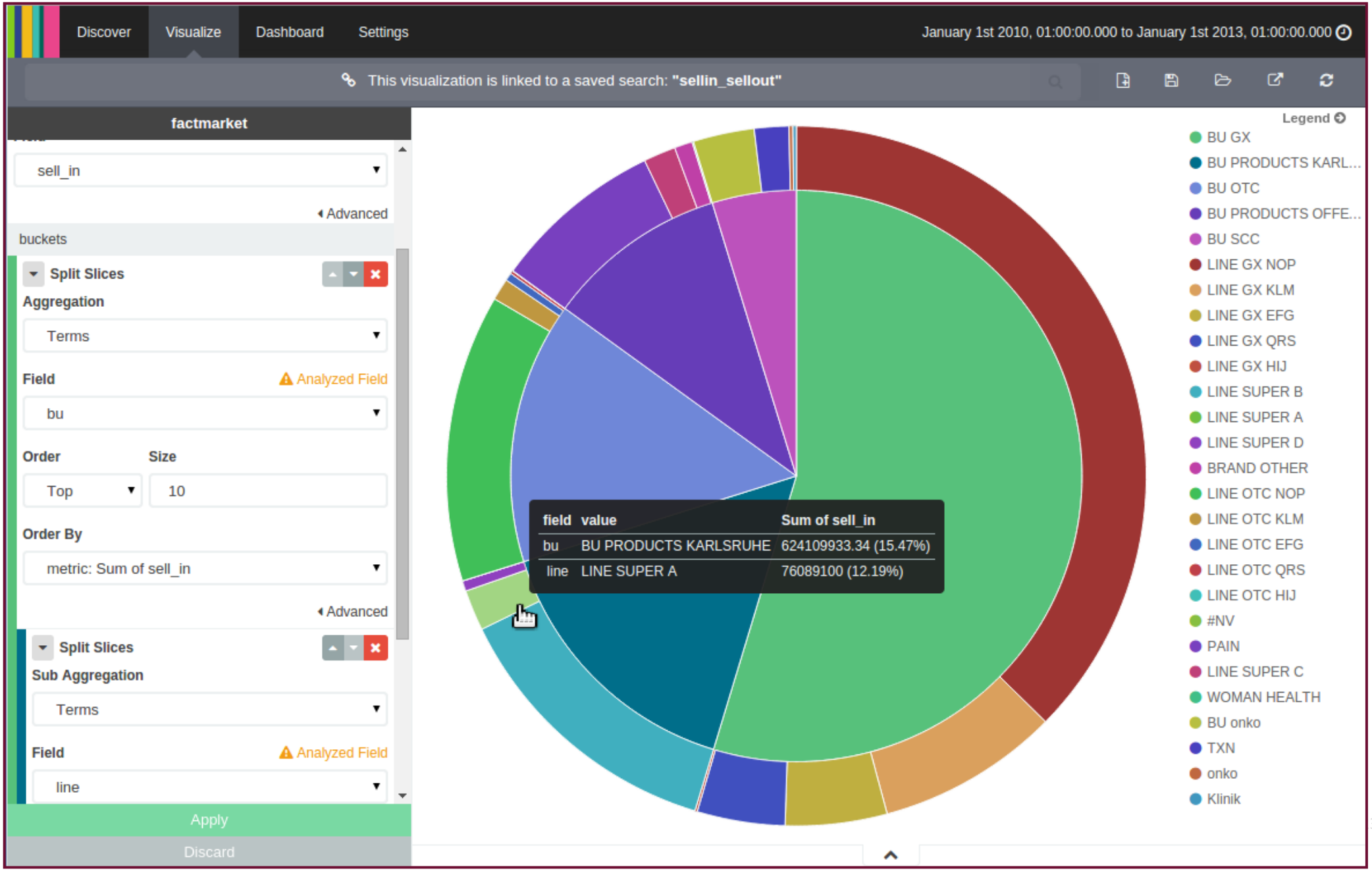
Donat-Diagramm für SellIn auf BU-und Linien-Ebene



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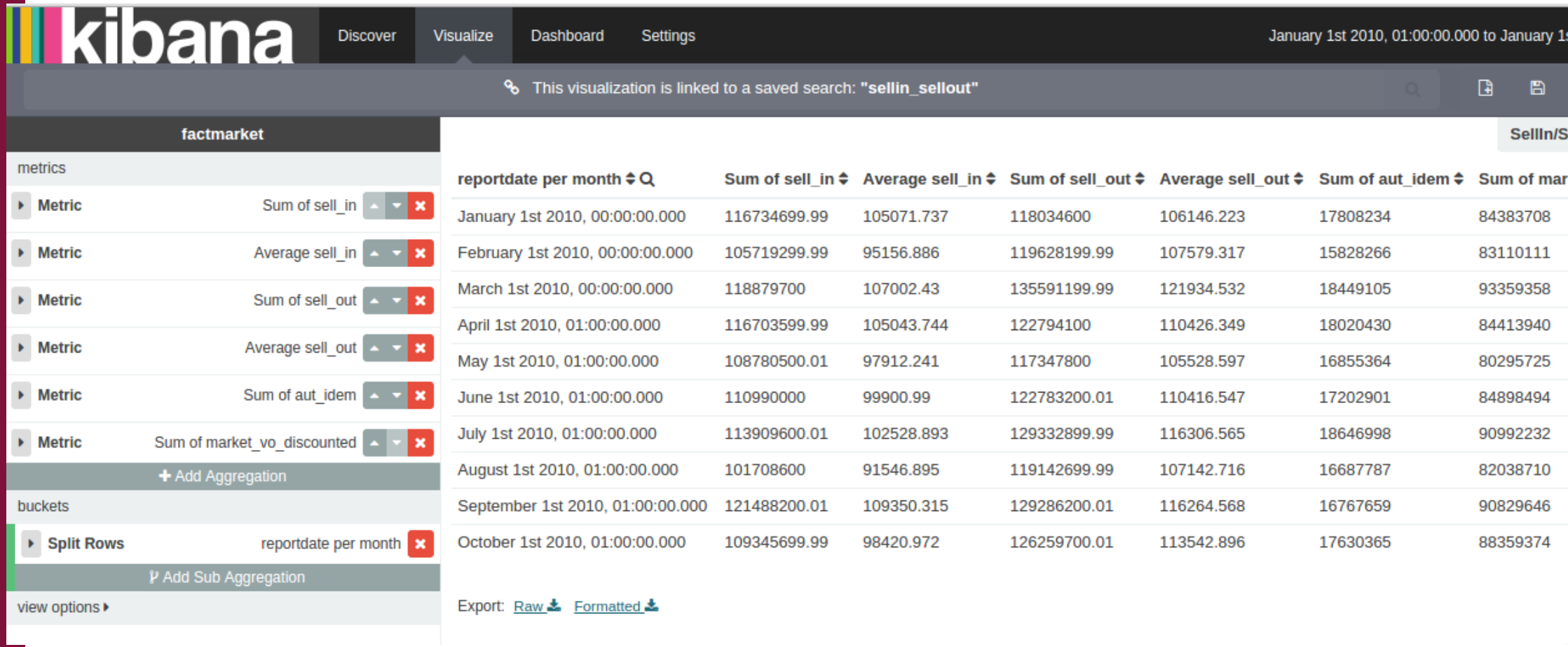
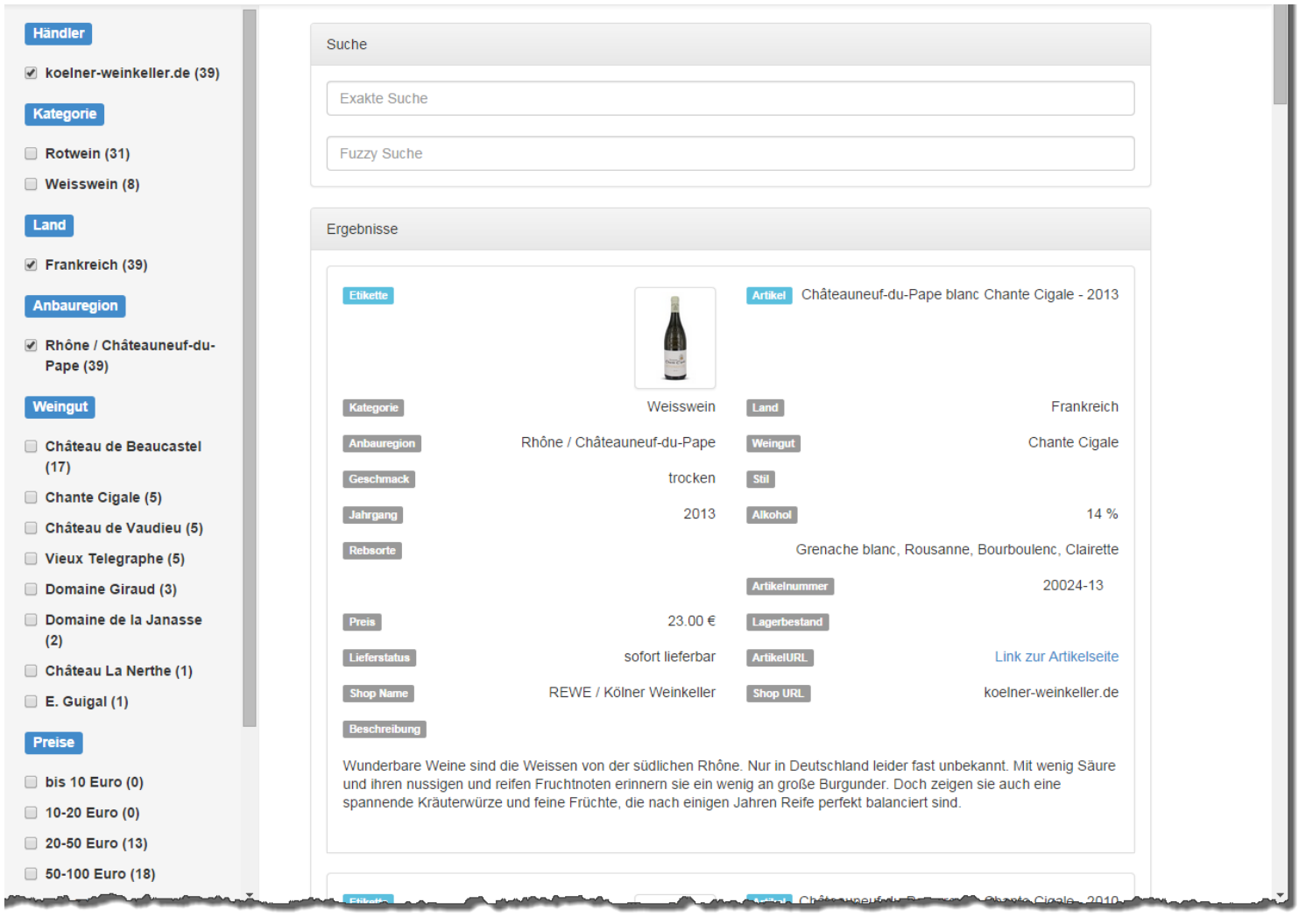
Visualisierung von Aggregationen mit einer Tabelle



Competitive Intelligence als weiteres Einsatzszenario

Beispiel Shop/Handel: Mapping bspw. über den Weinnamen, falls keine eindeutige ID wie EAN Code vorhanden ist



Fazit

- Aggregationen ersetzen Dimensionen im Star-Schema
- Near Realtime
- Leichtgewichtig
- Kostengünstige Alternative
- Einfach zu integrieren und erweitern
- Kombinierbar mit Vorteilen von Suchmaschinen
  - Matching
  - Unstrukturierte Daten

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Fragen?

Vielen Dank!

http://blog.exensio.de

@tokraft

Partner:

elasticsearch.

ORACLE PARTNERNETWORK