

25.98K



Patrick Bürgin

ADD A VISUALIZATION

 Animated Number

 Bar Chart

 Cluster Map

 Gauge

 Highstock Line

 Line Chart

 Pie Chart

 Text



Design and Prototypical Implementation of a Dashboard System for Visualizing Semi-Structured Data in a Traceable Way

Final Presentation

Patrick Bürgin, 07.09.2015

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

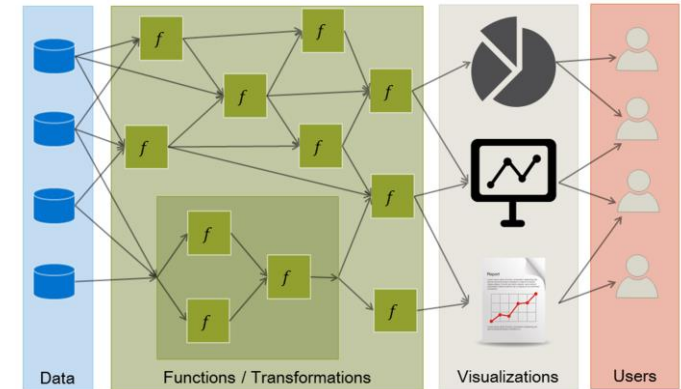
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UMBRELLA PROJECT

Spreadsheet 2.0 – User-oriented tools for analyzing complex linked data

Addresses shortcomings of existing spreadsheet applications, e.g.:

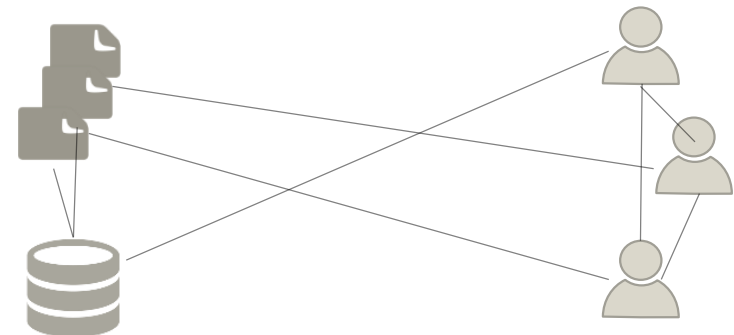
- Lack of transparency of a spreadsheet's design
- Lack of support for complex linked data
- No support for custom visualizations



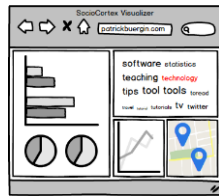
FOUNDATION

SocioCortex – A Social Content Hub

- Integrates data from various sources
- Dynamic information models
- Typed query language: **MxL**

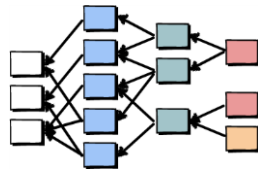


“A Dashboard System for Visualizing Semi-Structured Data in a Traceable Way”



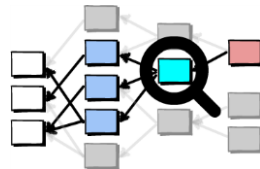
Visualization Environment

- Custom Visualizations
- Complex Linked Data



Traceability Environment

Who? What? When?



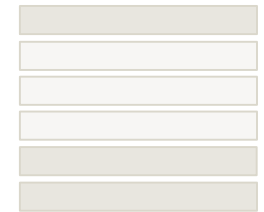
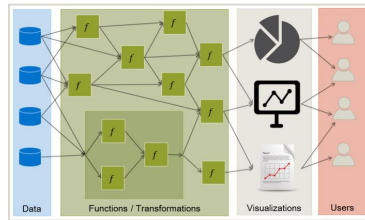
Outlook: Network Analysis

ENVIRONMENT

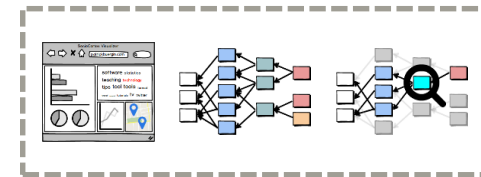
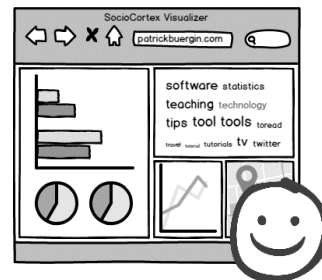
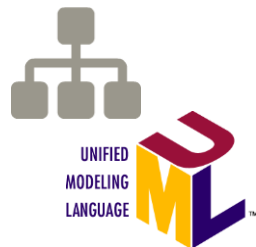
KNOWLEDGE BASE



MxL



DEVELOP / BUILD

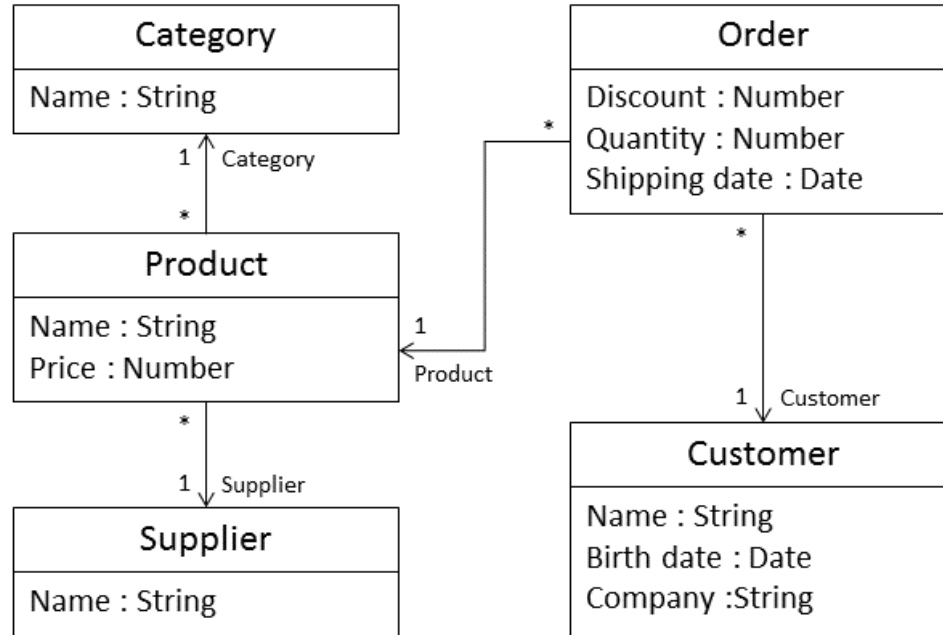


+ TypeScript +

SocioCortex

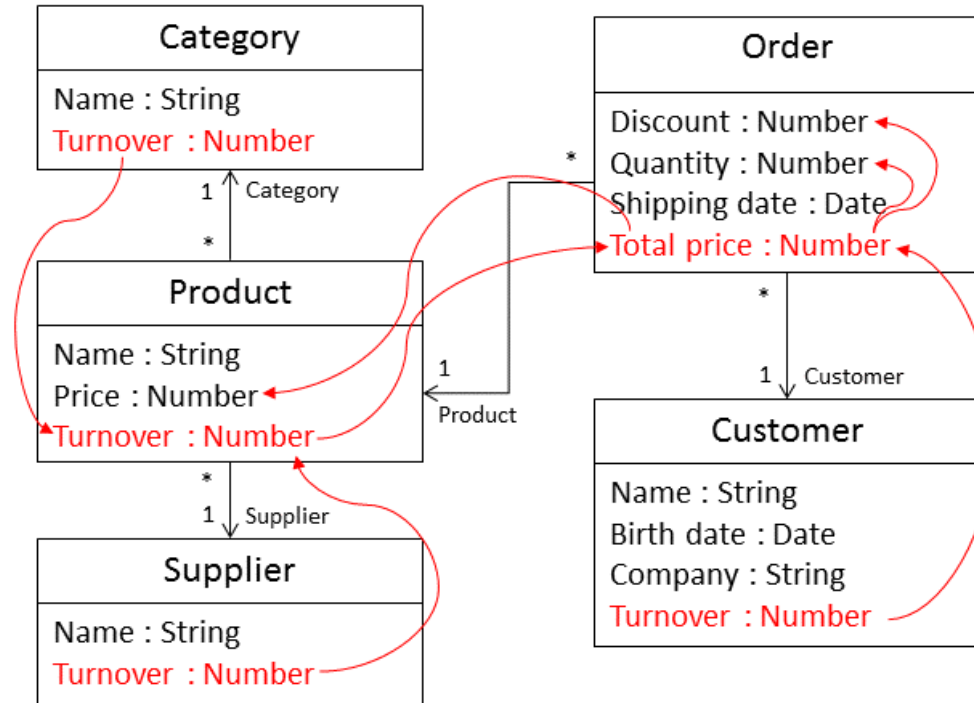
JUSTIFY / EVALUATE

- **Exploratory Case Studies with Two Industry Partners**
- Preliminary: Discussions within the Research Group + Monitored Usage



EXCERPT: PRODUCTS IN WORKSPACE NORTHWIND

<input type="checkbox"/>	Product	Category	Price	Supplier
<input type="checkbox"/>	Alice Mutton	Meat and Poultry	5	Pavlova, Ltd.
<input type="checkbox"/>	Boston Crab Meat	Seafood	18.4	New England Seafood Cannery
<input type="checkbox"/>	Camembert Cheese	Dairy Products	10	Pavlova, Ltd.



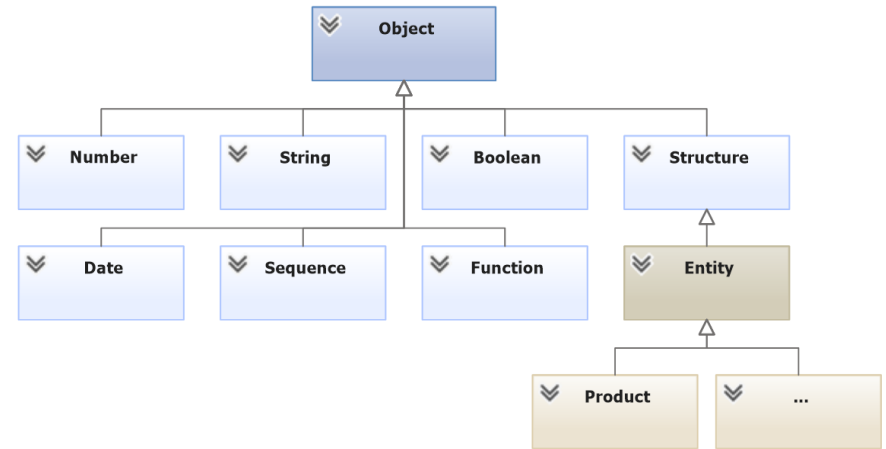
EXCERPT: PRODUCTS IN WORKSPACE NORTHWIND

<input type="checkbox"/>	Product	Category	Price	Supplier
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<input type="checkbox"/>	Boston Crab Meat	Seafood	18.4	New England Seafood Cannery
<input type="checkbox"/>	Camembert Cheese	Dairy	10.5	Pavlova, Ltd.

KEY CHARACTERISTICS

A functional, **statically type-safe** language, which can be used for **query formulation** and data transformation within SocioCortex.

EXCERPT: TYPE HIERARCHY



EXPRESSION EXAMPLES

```
find Product /* returns Sequence<Product> */
```

```
find Product  
  .select(Price)  
  .sum() /* returns Number */
```

```
Sequence<Product> is Sequence<Entity> /* true */
```

```
Sequence<Product> is Sequence<Object> /* true */
```

```
Sequence<Product> is Sequence<Structure<Price: Number>> /* true */
```



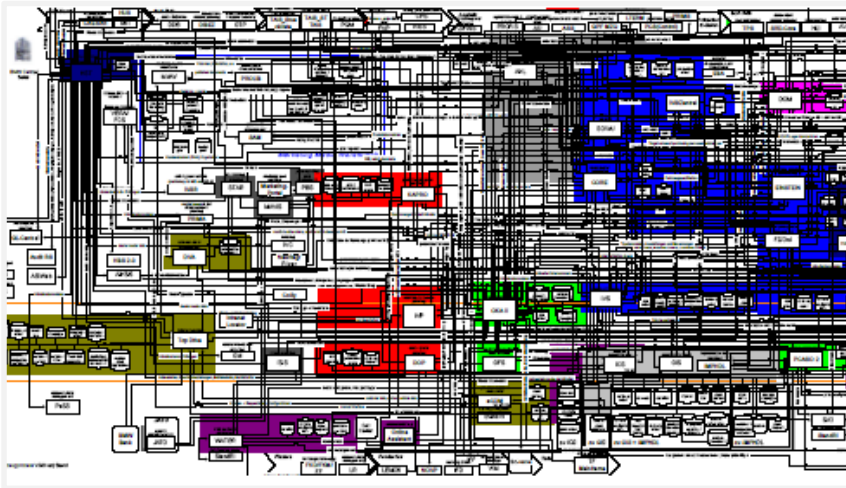





Case 1: EAM

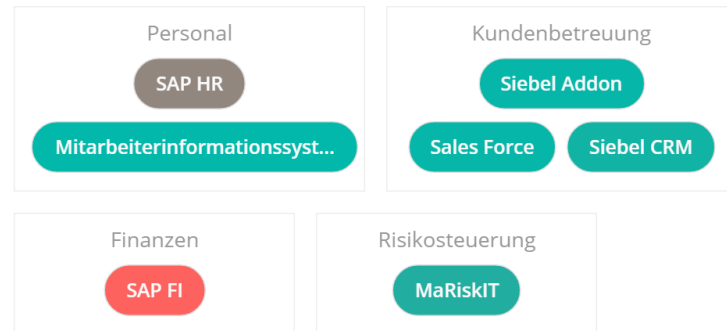
Background & Scenario

ENVIRONMENT



EXEMPLARY VISUALIZATION TYPE

Cluster Map



SCENARIO



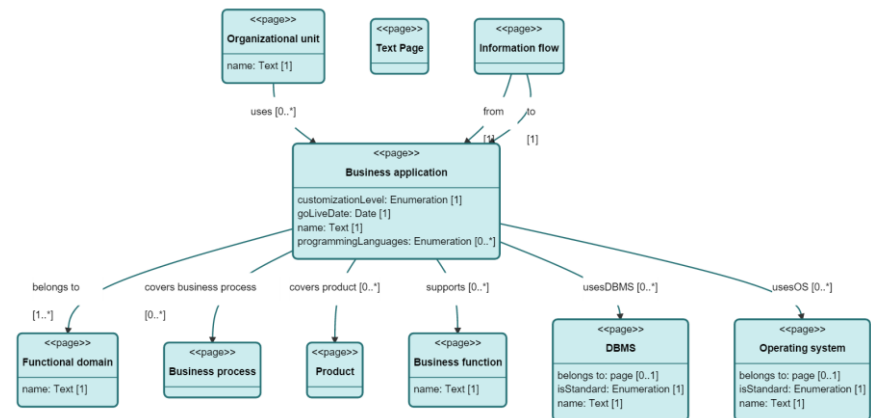
- Focus on Manual Assessments
- Flexible Information Models



IT Service Provider
5000-10000 Employees



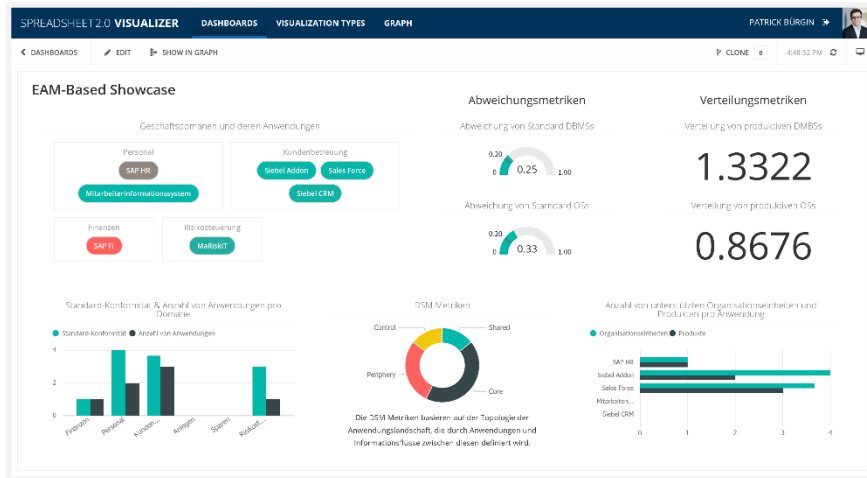
Enterprise Architect
9Y Professional Experience



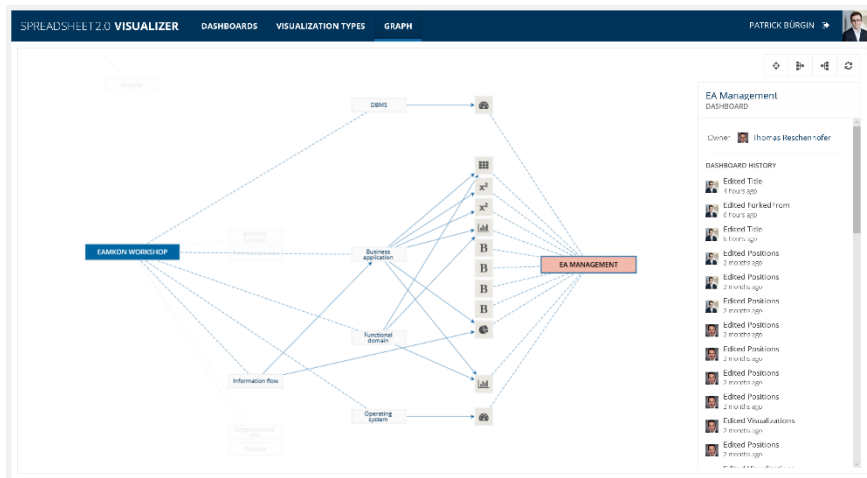


Case 1: EAM Findings

DASHBOARD



GRAPH



FEEDBACK

USE CASES



- Usage Analysis
- Stakeholder Identification
- Impact Analysis

LIKES



- Graph Exploration
- UX
- Interactivity

IMPROVEMENTS



- Analyze User Behavior
- Advanced Code Management
- Filtering & Interactivity



Case 2: Financial Services

Background & Scenario

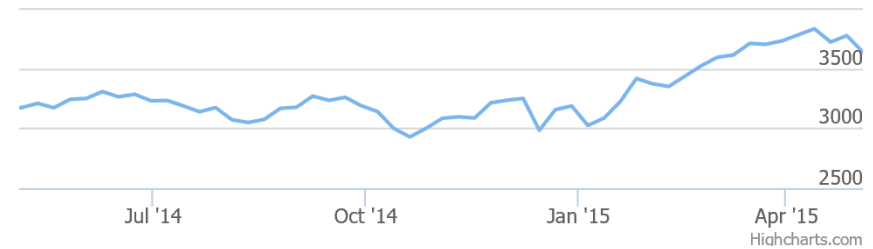
ENVIRONMENT



EXEMPLARY VISUALIZATION TYPE

Highstock Line

Zoom 1m 3m 6m YTD **1y** All



- Focus on Time Series Data
- Complex Transformations



Insurance & Investment Group
10001+ Employees



IT Infrastructure Manager
Branch: Investment & Risk Strategy

SCENARIO



ESTX50



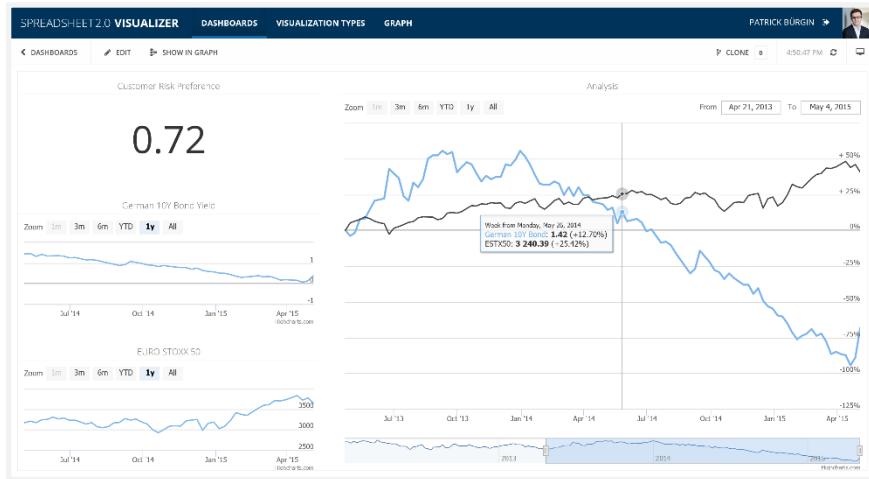
10Y Bond Yields

Image Source: By Allan Ajifo [CC BY 2.0], via Wikimedia Commons

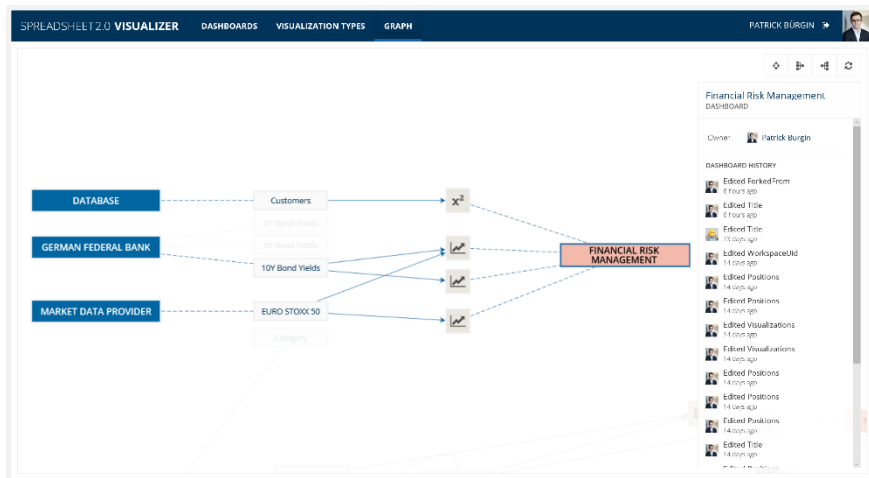


Case 2: Financial Services Findings

DASHBOARD



GRAPH



FEEDBACK



USE CASES

- Support Data Exchange
- Impact Analysis
- Address Compliance Demands

LIKES



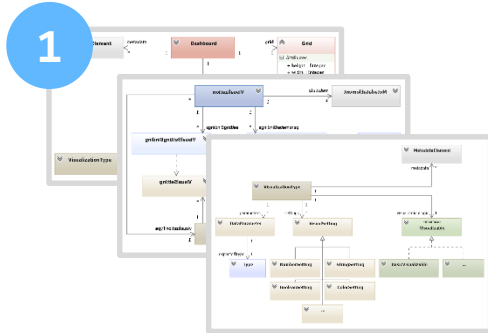
- UX
- Customizability
- Vision

IMPROVEMENTS



- Analyze Transformations
- Integration & Scalability
- Filtering & Interactivity

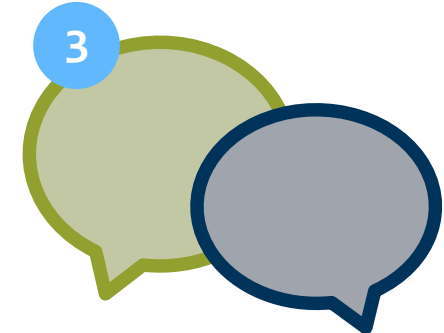
MAIN CONTRIBUTIONS



Concepts & Models



Prototypical Implementation



Case Study Report

BYPRODUCTS



sebischair

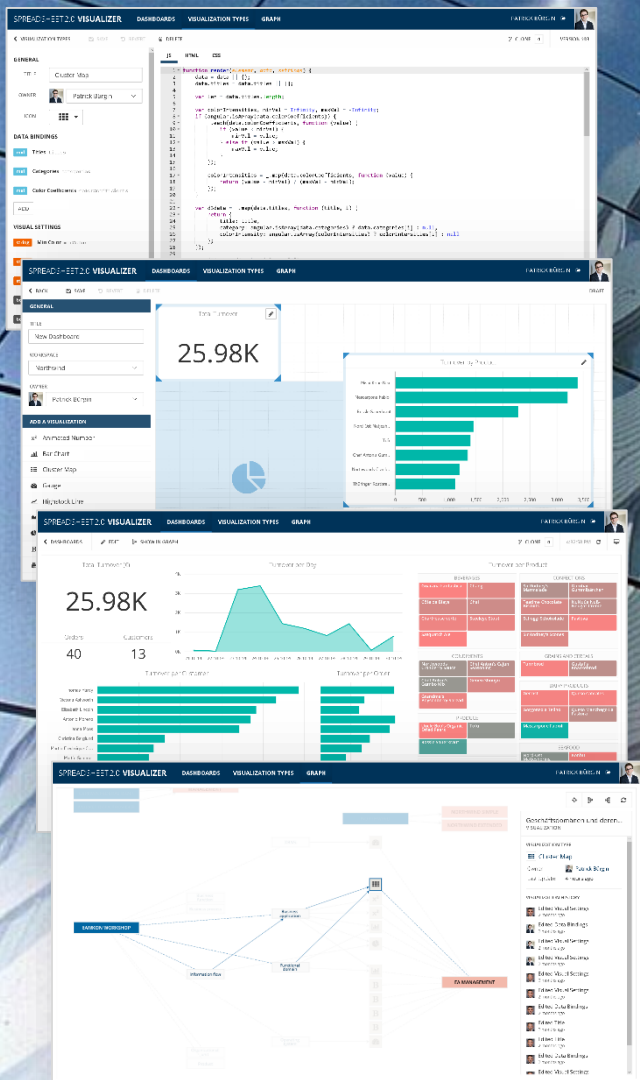
sc-angular



angular-widget-grid

A flexible grid layout for responsive dashboards

13 ★



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 Chair of Software Engineering for
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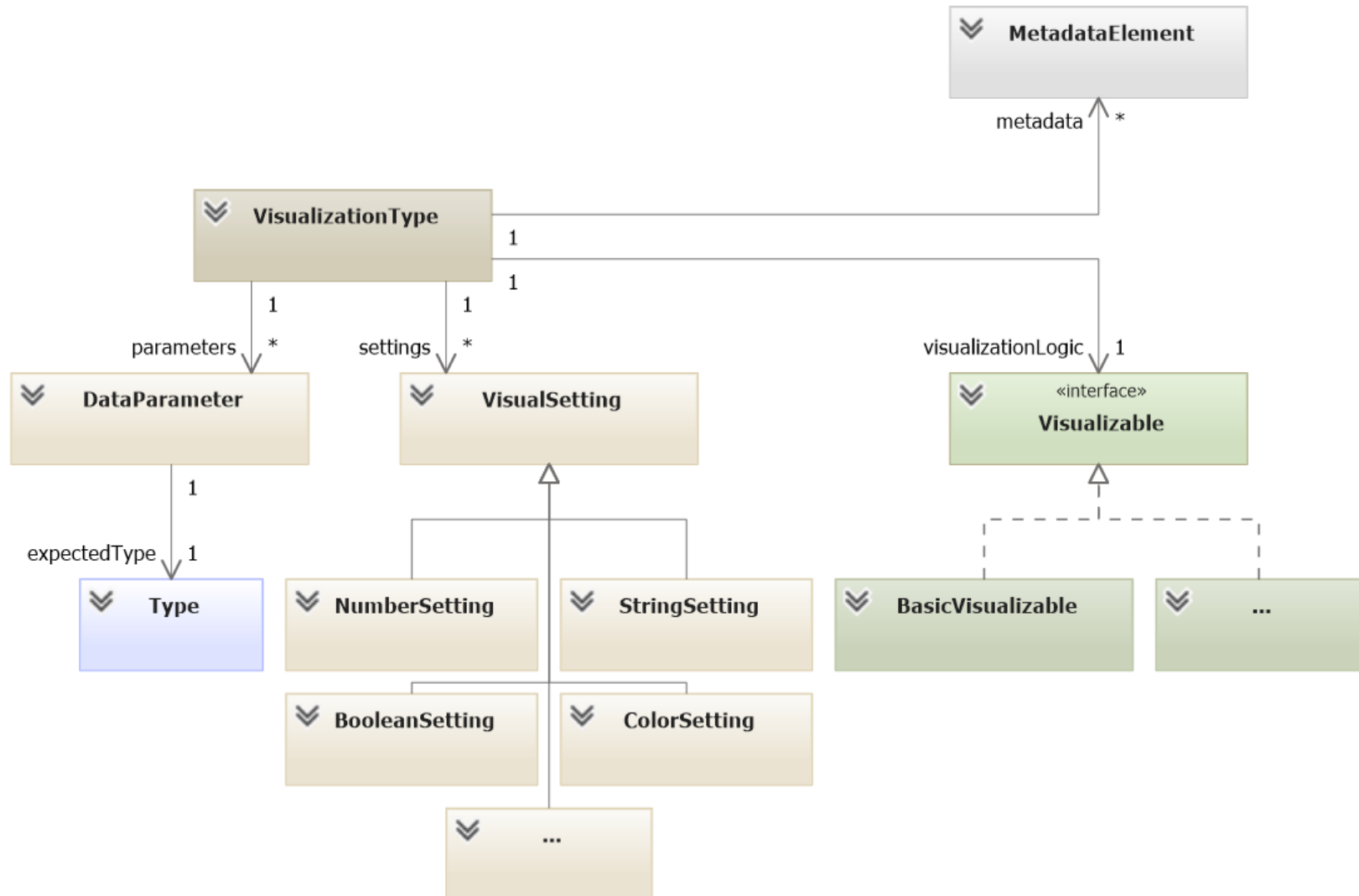
Patrick Bürgin
 B. Sc.

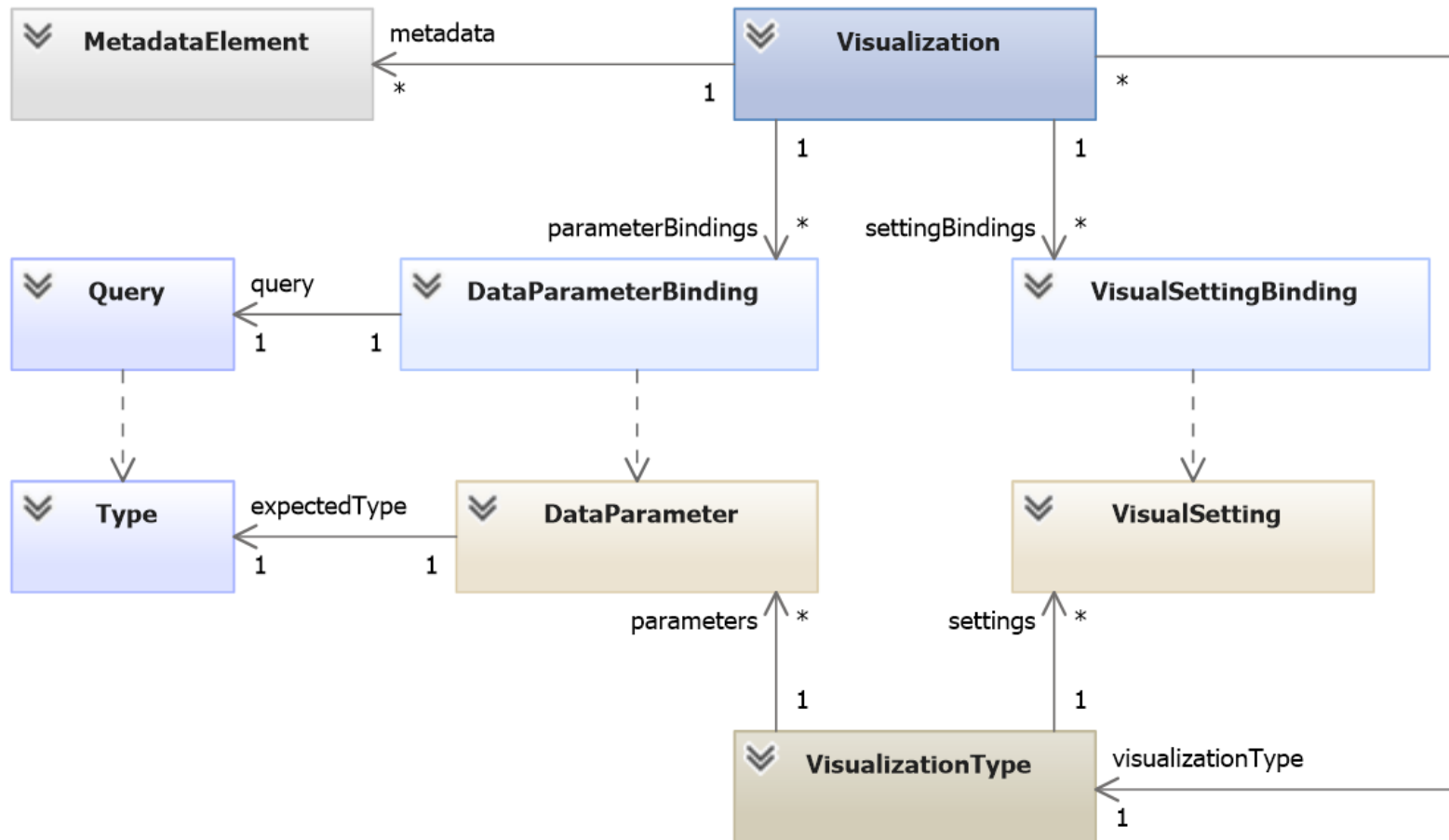
patrick.buegin@tum.de
patrickbuegin.com

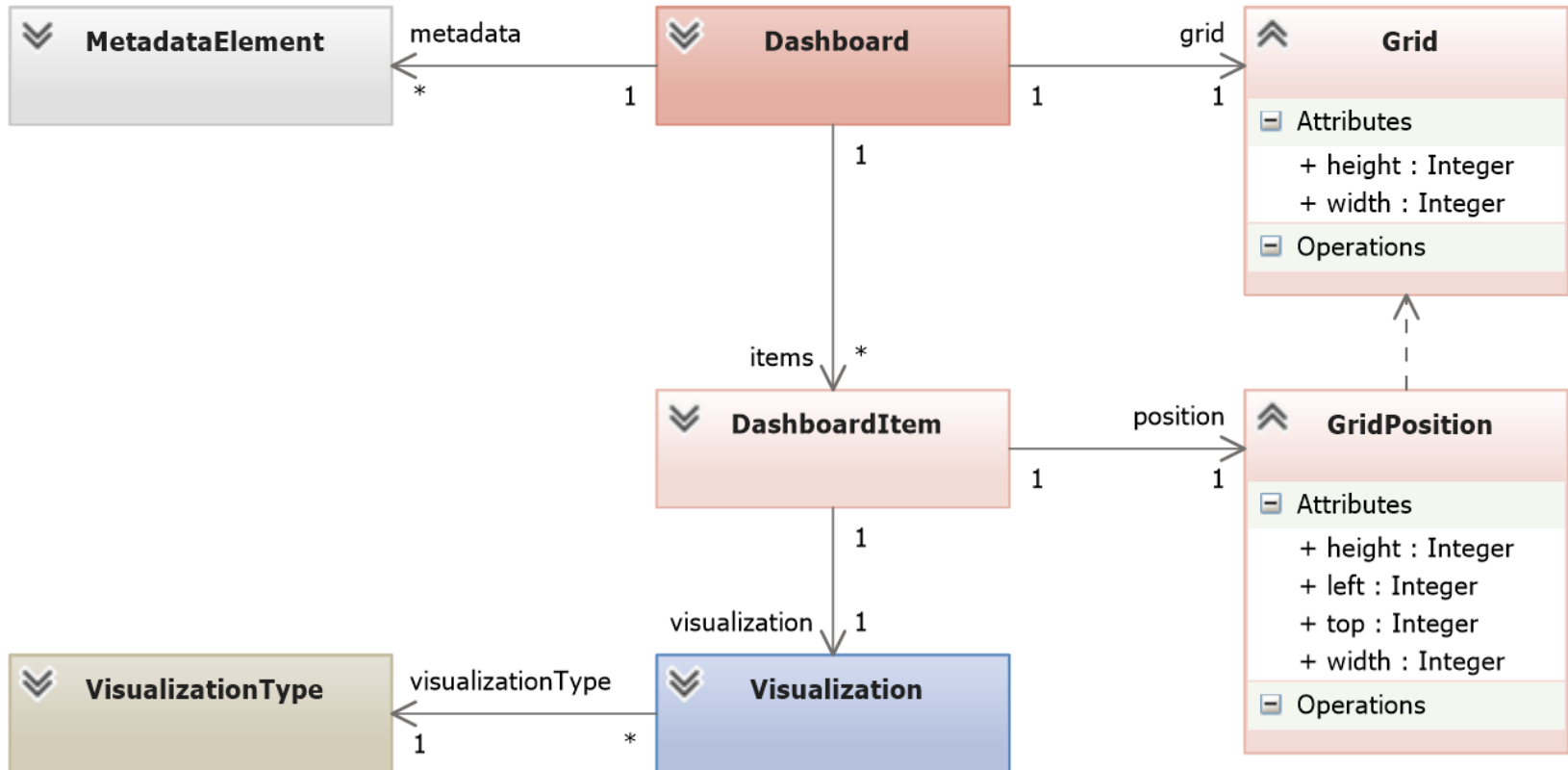
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BACKUP







“A Dashboard System for Visualizing Semi-Structured Data in a Traceable Way”

