

# Recommendation techniques and end-user guidance for collaborative Knowledge-Intensive Processes

Sebastian Fröhlich

18.05.2015

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

[www.matthes.in.tum.de](http://www.matthes.in.tum.de)

## **1. Introduction**

1. Motivation
2. Research Questions

## **2. Use Cases**

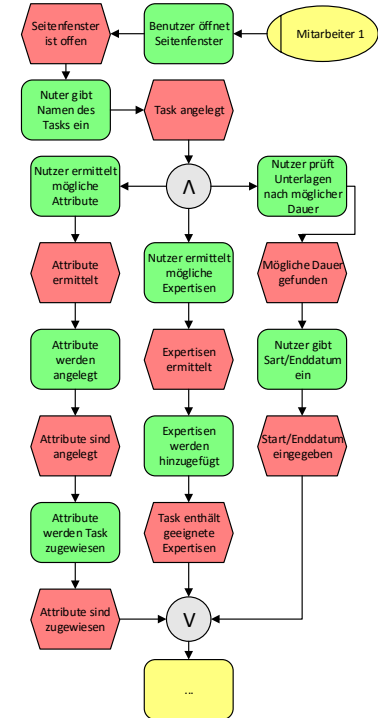
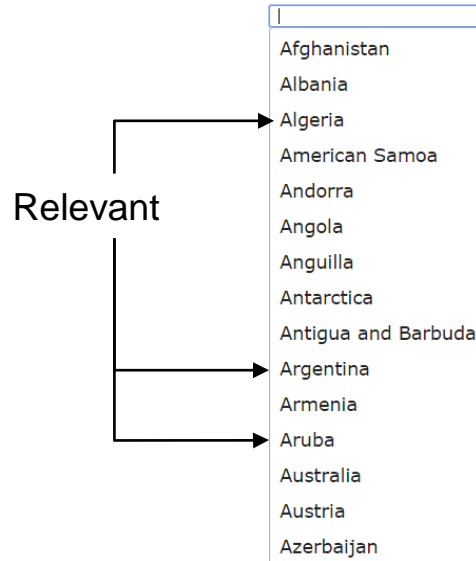
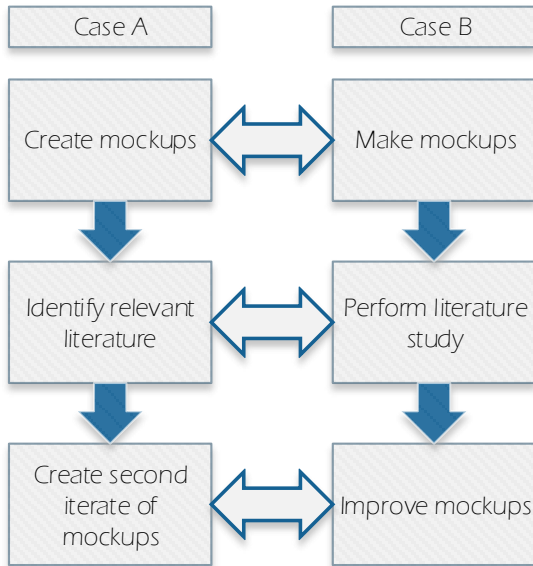
## **3. Approach**

1. Conceptual Structure
2. Related Work
3. Conceptual Approach

## **4. Roadmap**

## **5. Discussion**

Adapted from current Darwin feed



## Guidance and recommendation

### Structuring

(similar naming lead to higher recognition)

### Usability

(recommend only relevant options)

### Efficiency

(reuse of predefined Structure with one click)

How can recommendations help to guide users?

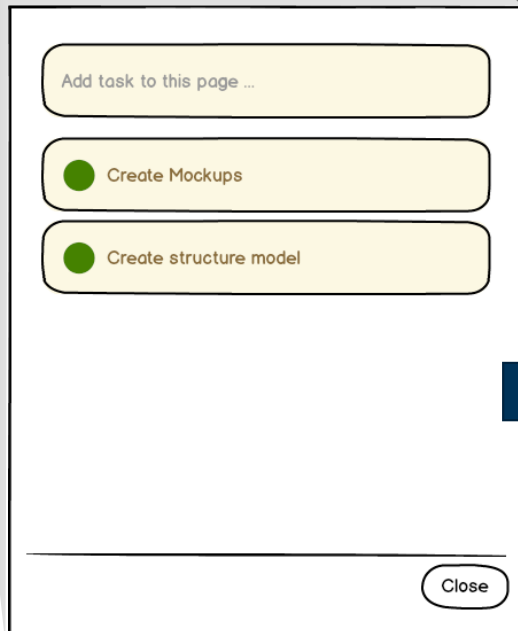


Which existing approaches can be applied to achieve the recommendation?

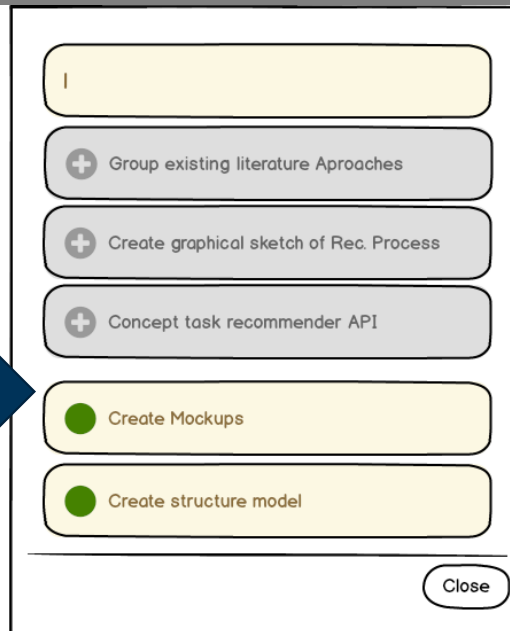


How do a recommendation model look like?

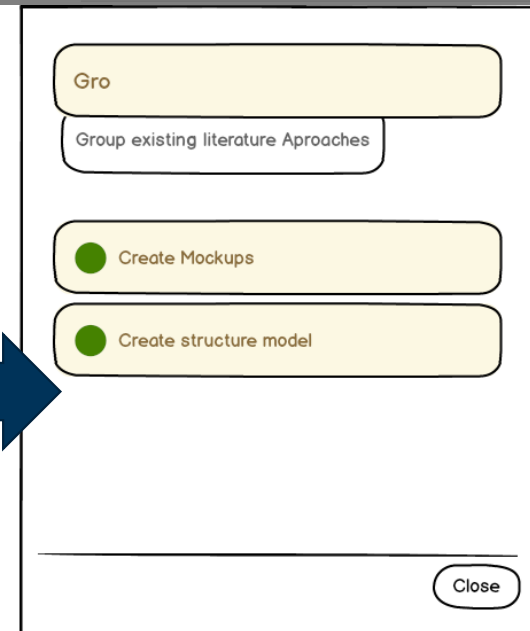
# Use Cases (1): Task Recommendations



Current State

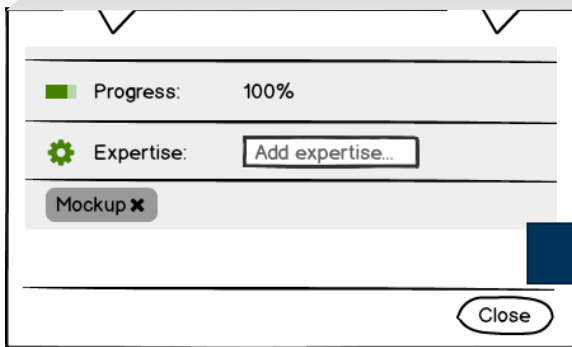
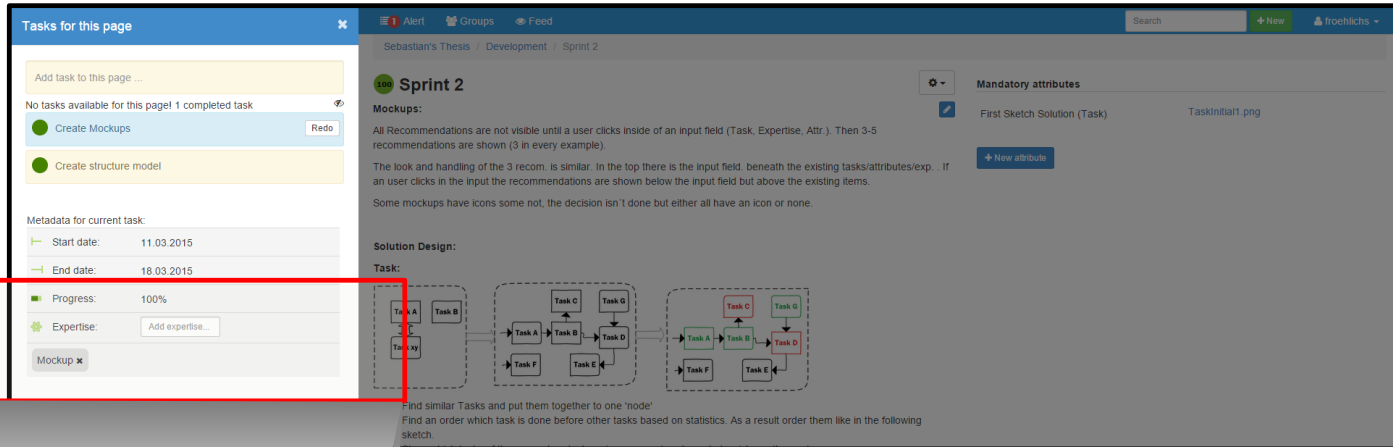


Simple Task Recommendations

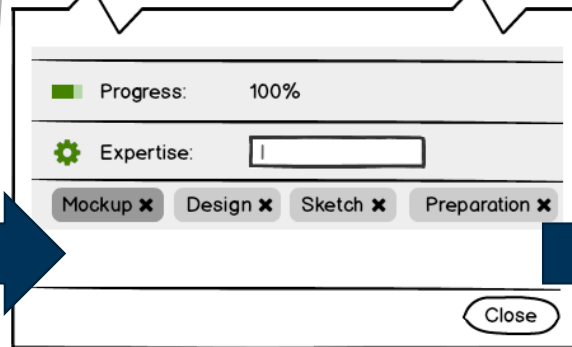


Advanced Task Recommendations

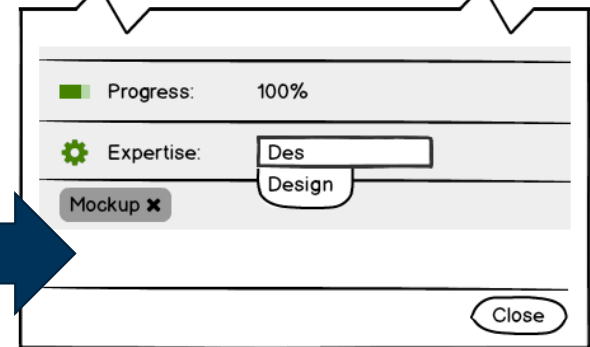
# Use Cases (2): Expertise Recommendations



Current State

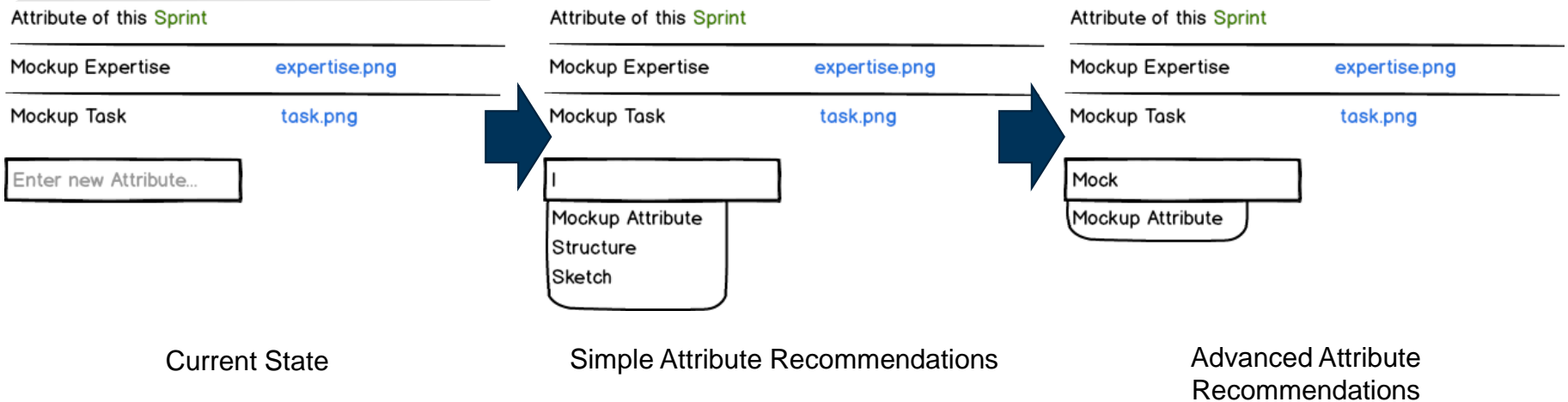
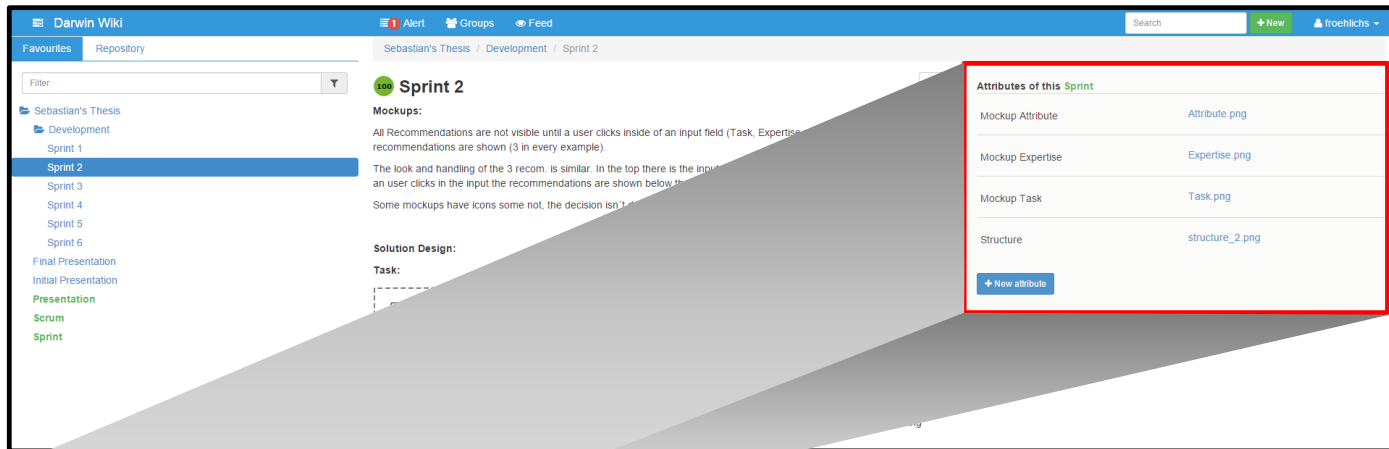


Simple Expertise Recommendations



Advanced Expertise Recommendations

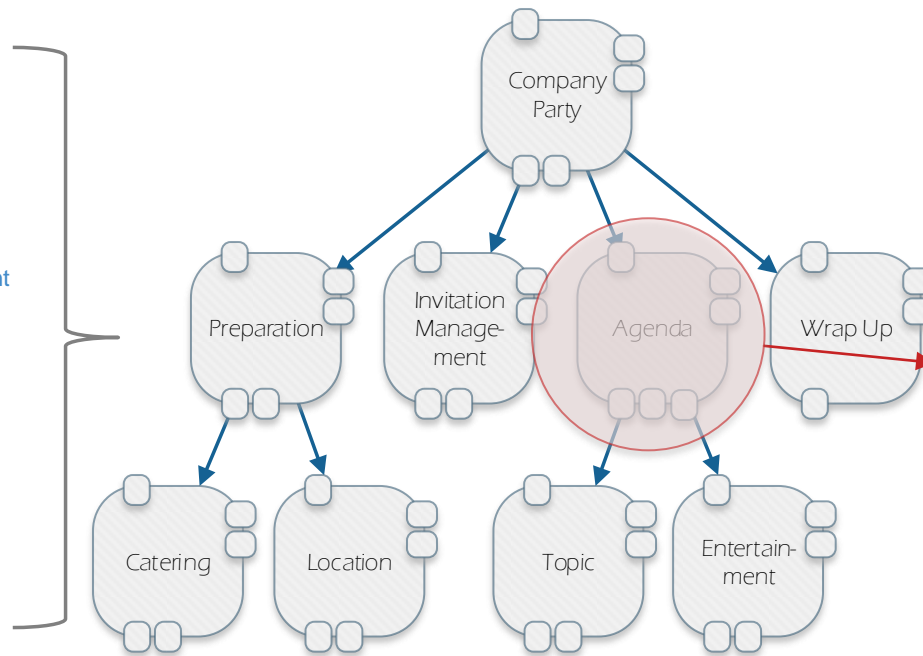
# Use Cases (3): Attribute Recommendations



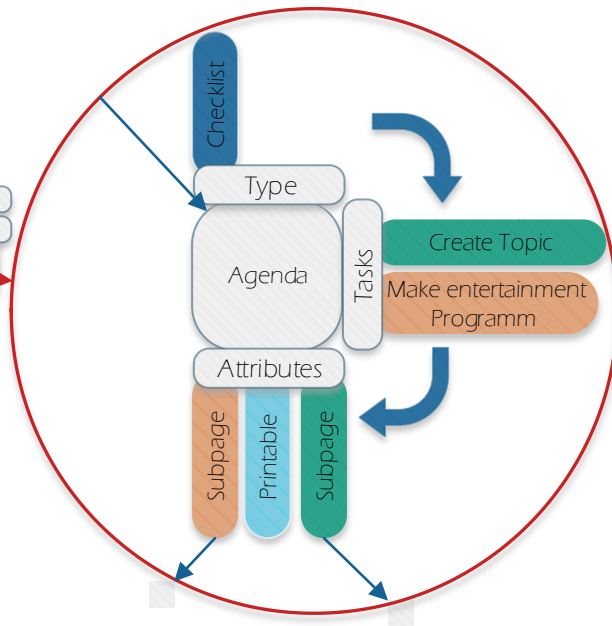
## Page Hierarchy

- Company Party
  - Organisation
    - Preparation
    - Catering
    - Location
  - Invitation Management
  - Agenda
    - Topic
      - Entertainment
      - Games
      - Speech
    - Wrap Up
  - Calculation

## Conceptual Structure



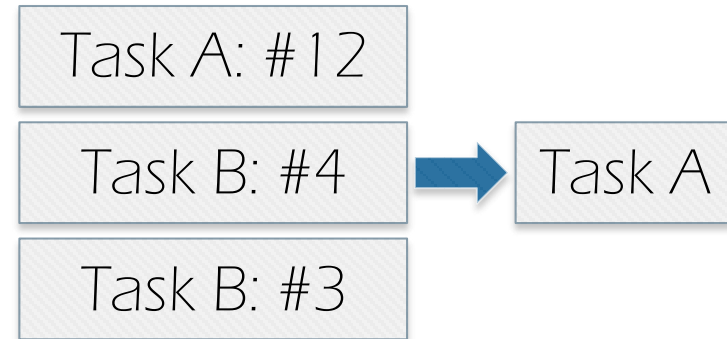
## Conceptual Element





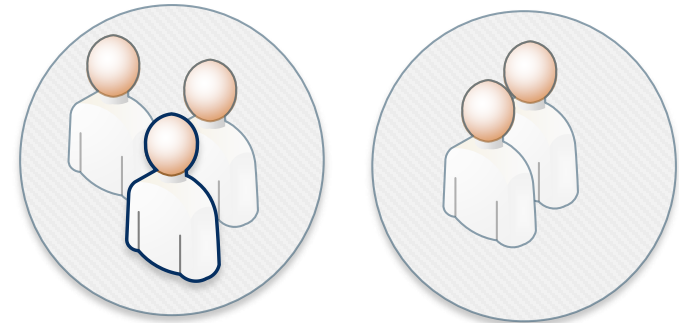
## Context insensitive Recommendations (Nauerz, 2012)

- + Important at any time
- Can be completely unnecessary in context
- Maybe false point of time



## Clustering (Jannach, 2011) (Klahold, 2009)

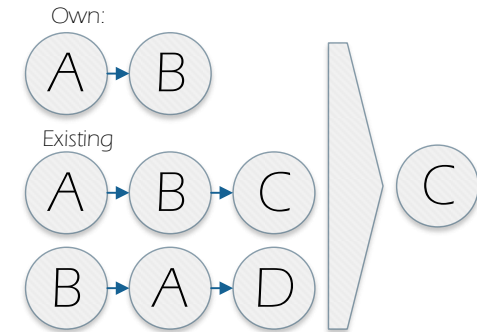
- + High chance that similar users do similar tasks
- Can be completely unnecessary in context



## Based on History:

By similarity (Motahari-Nezhad et al., 2011)

- + Similar finished tasks in similar order => high chance to predict next task in context
- Only good result if similarity is high enough



User / Crowd based (Dorn et al., 2010)

- + Adept better to completed workflows
- No direct support for different task stages

$$R_{sum} = \alpha * R_{user} + (1 - \alpha) * R_{crowd}$$

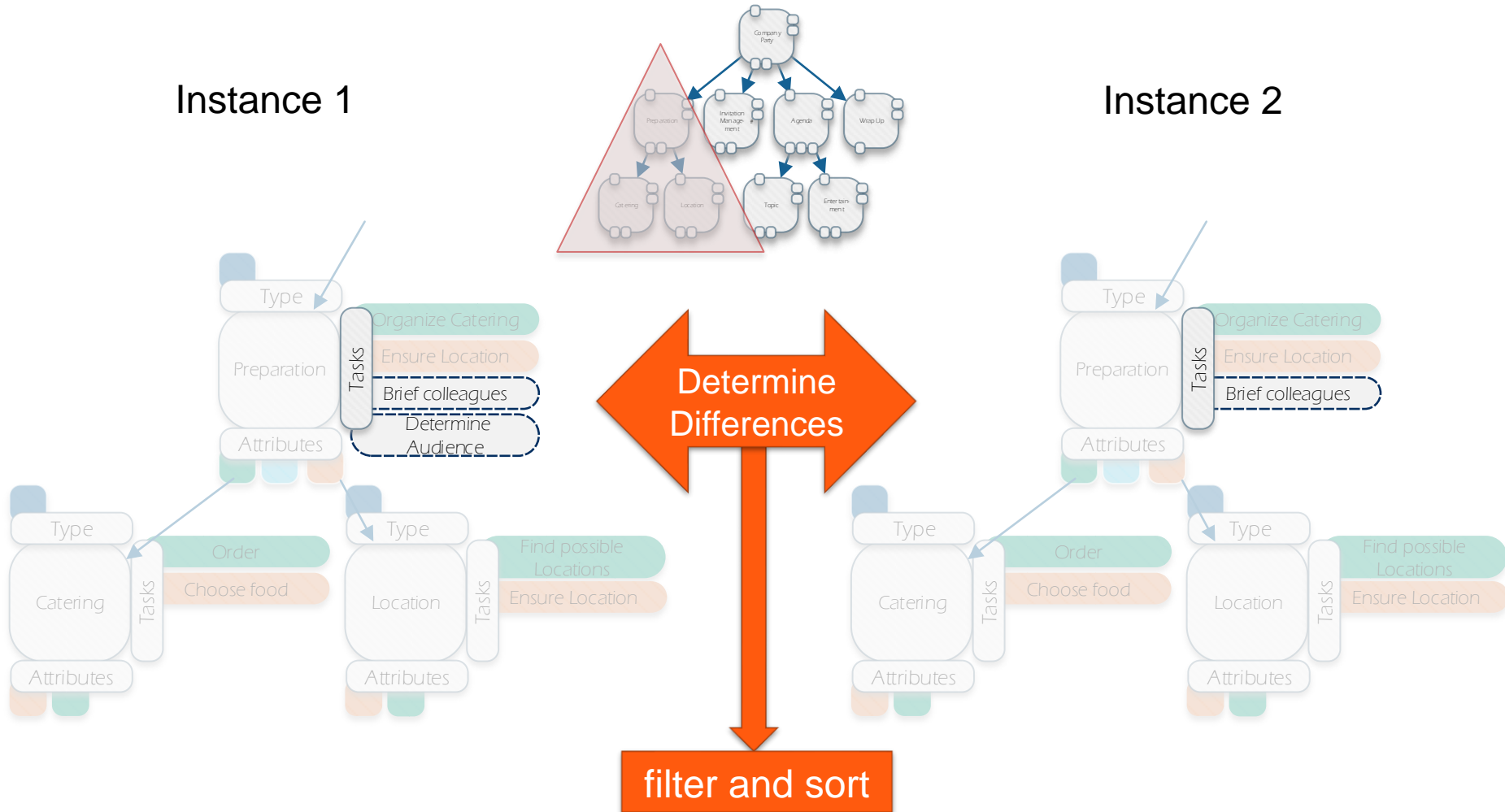
With heuristics (van der Aalst et al., 2003)

- + Can deal with noise and incomplete logs
- Different workflows lead to very large table with mostly null values

$$IF (A \rightarrow B) AND \neg(B \rightarrow A) \Rightarrow a \rightarrow b$$

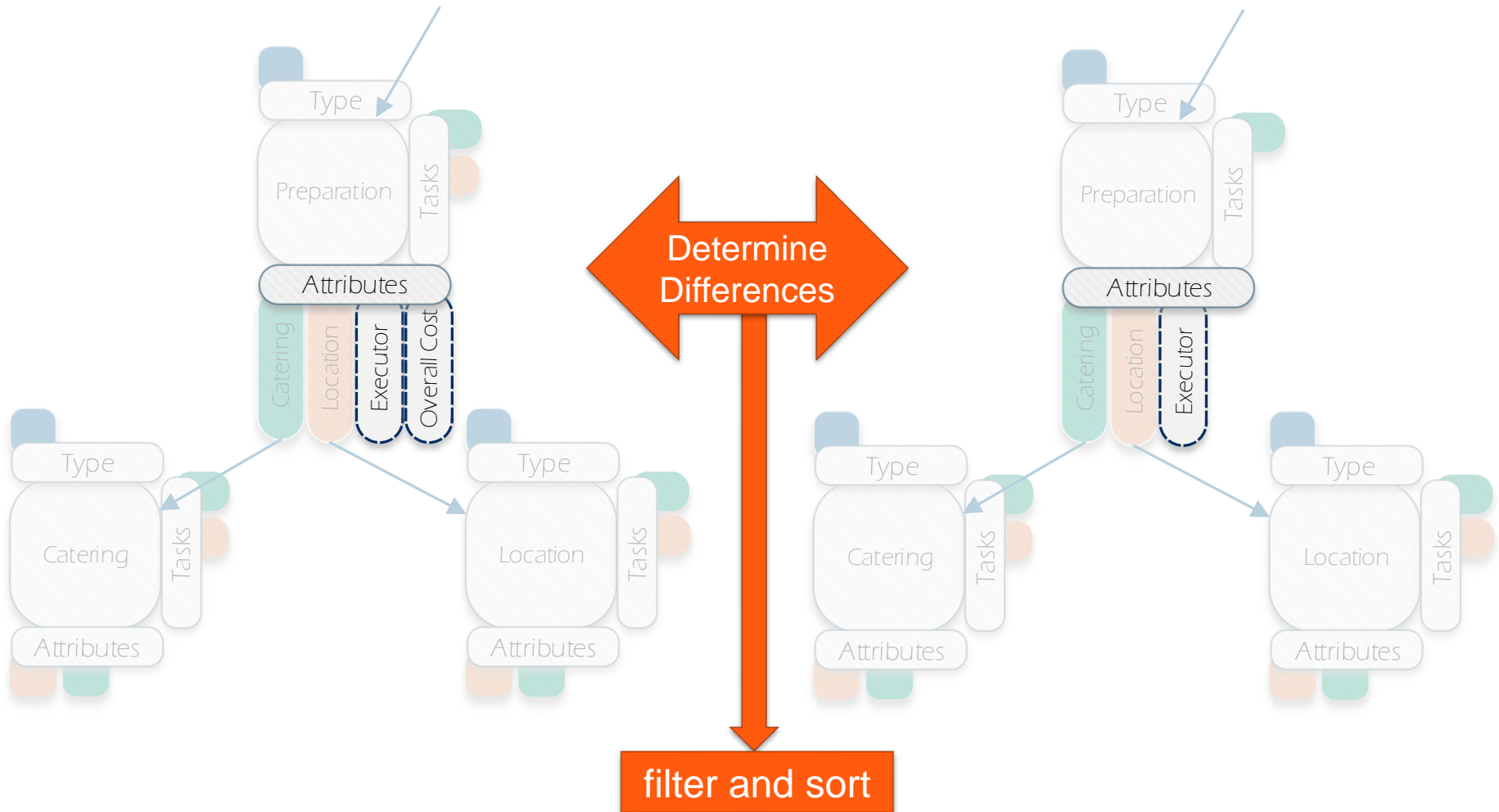
Instance 1

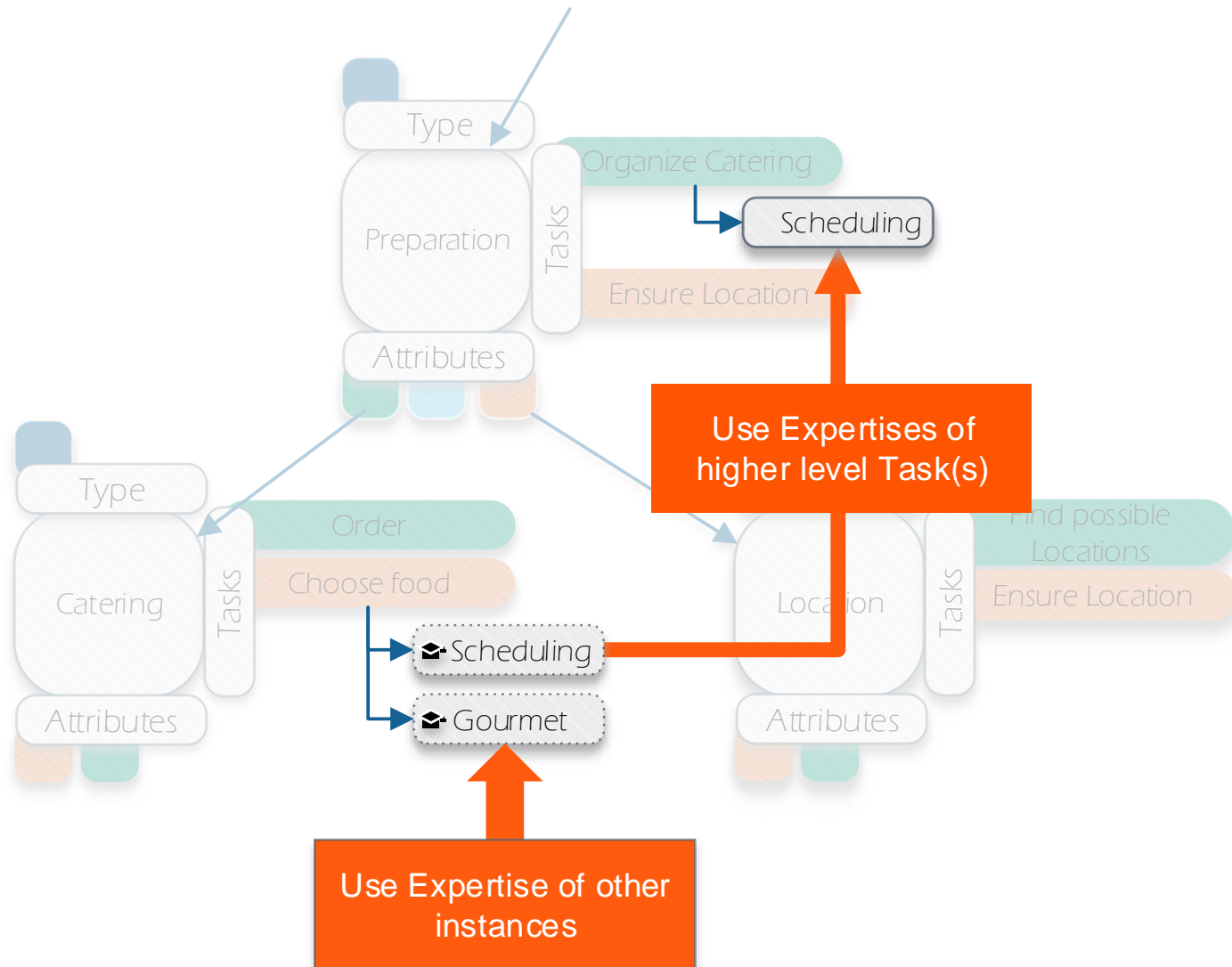
Instance 2

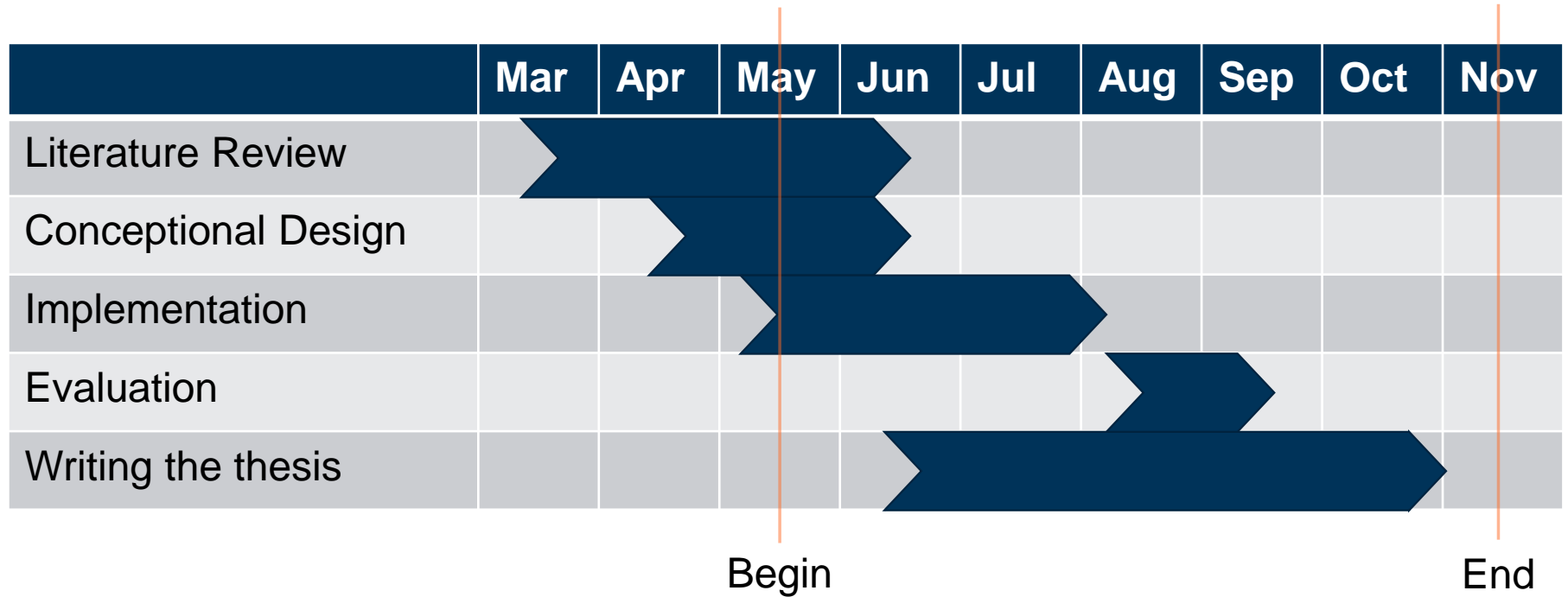


Instance 1

Instance 2









# Discussion



**Sebastian Fröhlich**



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

Boltzmannstraße 3  
85748 Garching bei München

Tel +49.89.289.17129  
Fax +49.89.289.17136

[www.matthes.in.tum.de](http://www.matthes.in.tum.de)