

# Implementing a Web Client for Social Content and Task Management

Master's Thesis Final Presentation

10.10.2016, Björn Michelsen

Software Engineering für betriebliche Informationssysteme (sebis)  
Fakultät für Informatik  
Technische Universität München

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

1. Introduction

2. Research Questions & Objectives

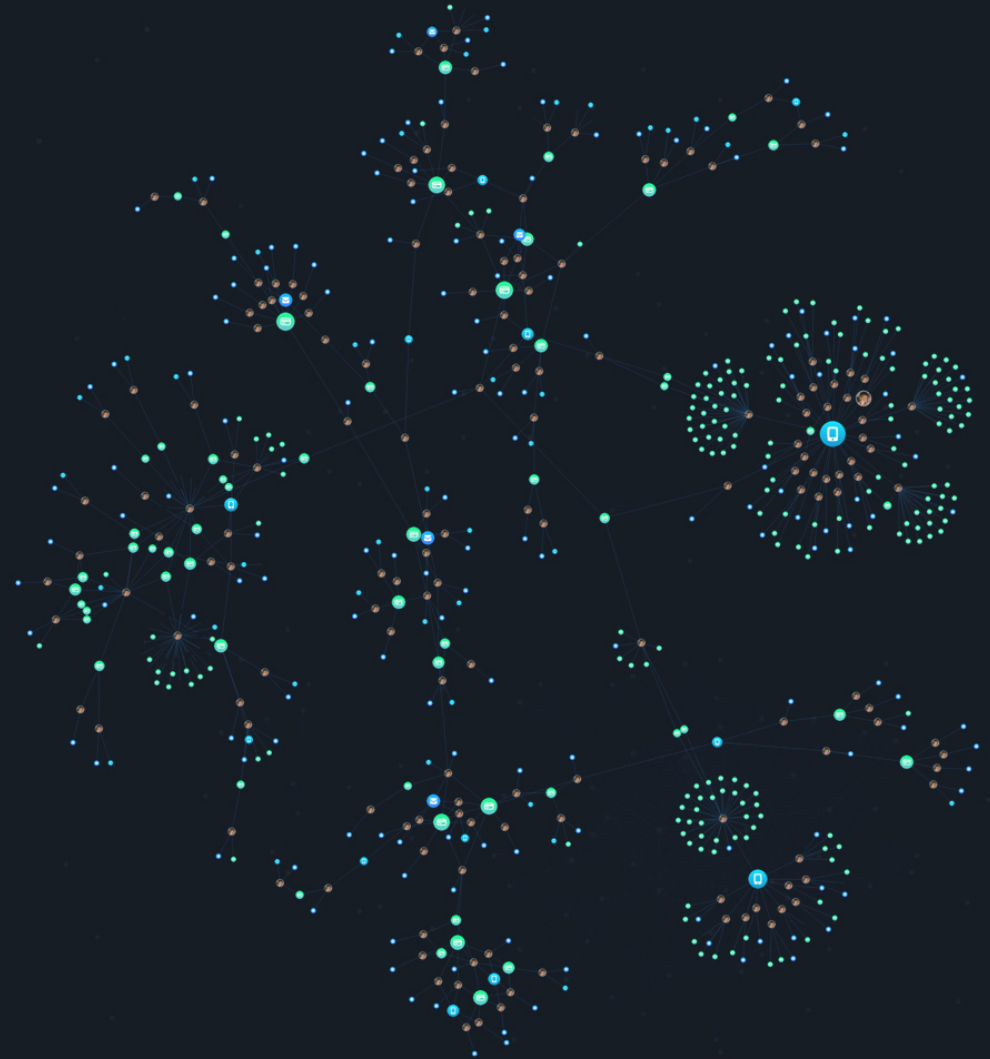
3. Approach

4. Evaluation

5. Demo

5. Conclusion & Outlook

- Increasing importance of knowledge work in enterprises
- Consequently, increasing importance of complex, knowledge-intensive processes
- Hybrid wikis as an exciting approach to support such processes in a flexible way



**Tricia (Hybrid Wiki)**

**Darwin(Task-based Concept)**







- Mockups by Florian Katenbrink
- Initial implementation of the content manager by Michael Ostner
- SC-Angular as abstraction of the SocioCortex Rest API
- SocioCortex Rest API documentation
- SocioCortex backend and documentation

# Introduction - Previous Work (Mockups)

The screenshot displays a web application interface for 'sebis' (Fakultät für Informatik, Technische Universität München). The main content area features a profile for 'Master's Thesis Felix Michel' with a search bar, navigation menu, and a list of tags including 'guided research', 'hauder', 'organic data science', 'collaboration', 'masterthesis', 'bpm', and 'case management'. The profile includes an abstract titled 'A Structured Task-Centered Framework for Online Collaboration' and a 'Student Project' sidebar with a table of tasks.

Attributes	Tasks
Sign Copyright Agreement	Progress: 0%
	Start Date: 15.07.2015
	End Date: 22.07.2015
	Owner: Felix Michel
	Expertise: Management, Liability
Copyright agreement publication allowed	
Copyright agreement notification email	
Copyright agreement notification required	
Copyright agreement required	
Attribute name	Attribute value
Initial Presentation	
Kickoff presentation slides	

Below the main content, there are three overlapping browser windows showing contact information for Klym Shumaiev, Alexander Waldmann, and a video player for 'das Internet der Zukunft von Dr. Volker Stiehl (SAP)'. Each window includes a task table similar to the one above.



## Research Questions

- How can we implement a web-client for social content and task management upon SocioCortex that provides a high usability for end-users?
- How can patterns of Material Design be used to enhance the usability of wikis?

## Objectives

- Define use cases for the web client to set the scope of the work
- Create the web client based on constraints and previous work
- Evaluate the web client with participants familiar with EAM
- Document technical and design challenges for future work

- Use Cases
- Design Challenges
- Technical Implementation

- User Authentication
  - Logging in
  - Logging out
- Workspaces
  - Creating
  - Deleting
  - Renaming
  - Adding a workspace to favorite
  - Removing a workspace from favorite
  - Navigating between workspaces
  - Editing workspace settings
- Entities
  - Creating
  - Deleting
  - Renaming
  - Duplicating
  - Moving
  - Editing the content
  - Managing files
  - Editing settings
- Attributes
  - Editing an attribute
  - Creating a free attribute
  - Editing a free attribute
  - Deleting a free attribute
- Tasks
  - Creating
  - Editing
  - Deleting
  - Completing
  - Skipping
- User Profile
- Data Tables

- Use case specific design challenges
  - Workspaces
  - Tasks
- General design challenges
  - Material Design
  - Mockups

🔄
🔔
👤
⋮

[Sebis Public Website](#)
[Student News](#)
[Research News](#)
[BEAMS](#)
[EAM Pattern Catalog](#)
[AK Unternehmens-Architektur](#)

Filter Pages

- Team ▶
- Research ▶
- Publications
- Teaching ▶
- Thesis & Guided Research ▶
- Events ▶
- Sponsors & Partners
- Career Opportunities
- Contact
- Datenschutzerklärung ▶

## Master's Thesis Felix Michel

View ▾

guided research
hauder
organic data science
collaboration
masterthesis
bpm
case management

### A Structured Task-Centered Framework for Online Collaboration

*Abstract*

Today's scientific research collaborations are often multidisciplinary across organizational borders and time-zones. Communication that is based on emails or teleconferences is time consuming. In recent years many approaches have focused on building and establishing on-line communities. Other approaches focus on managing effort such as organizing work as tasks. Collaboratively working teams could potentially increase their efficiency by combining the task centered approach with the community approach. However, no existing approach combines an on-line community platform and a task centered approach to provide an open collaboration process. This thesis presents the Organic Data Science approach which enables an open task centered on-line collaboration process. Key principles to address challenges of the task-centered collaboration approach are 1.) the self-organization of the community through task decomposition, 2.) an on-line community support based on social design principles and best practices and 3.) an open science process to enable unanticipated contributions. The task-centered Organic Data Science framework approach is implemented based on the Semantic MediaWiki platform. The prototype implementation of the Organic Data Science framework is evaluated through a research project focused on the science question of modeling the age of water in an ecosystem. This project requires expertise in different research areas from multiple organizations within different time-zones. Different collaboration dimensions are evaluated such as how many different users access a task, how many different users are assigned to a task, how many different users edit the task metadata and how many different users edit the task content. The findings show that the framework supports the collaboration process. In general the Organic Data Science framework is designed for helping scientists to collaborate to solve complex scientific research questions. The use of the Organic Data Science framework is not limited to scientific purpose, it helps to support complex knowledge intensive collaborative processes.

Student Project

Attributes	Tasks
<div style="display: flex; align-items: center;"> <span style="color: red; font-size: 1.2em; margin-right: 5px;">●</span> <span>Sign Copyright Agreement</span> </div>	<ul style="list-style-type: none"> <li><span style="font-size: 0.8em;">Progress:</span> 0%</li> <li><span style="font-size: 0.8em;">Start Date:</span> 15.07.2015</li> <li><span style="font-size: 0.8em;">End Date:</span> 22.07.2015</li> <li><span style="font-size: 0.8em;">Owner:</span> Felix Michel</li> <li><span style="font-size: 0.8em;">Expertise:</span> Management, Liability</li> </ul>
Copyright agreement publication allowed	
Copyright agreement notification email	
Copyright agreement notification required	
Copyright agreement required	
<u>Attribute name</u>	<u>Attribute value</u>
<div style="display: flex; align-items: center;"> <span style="color: red; font-size: 1.2em; margin-right: 5px;">●</span> <span>Initial Presentation</span> </div>	<ul style="list-style-type: none"> <li>Kickoff presentation slides</li> </ul>

12:32 PM

# Approach – Design Challenges – Workspaces

The screenshot displays the sebis user interface. At the top, a dark blue header contains the sebis logo, a search bar, and navigation links: HOME WORKSPACE, NORTHWIND, IMPORT, PRESENTATION, and ALL WORKSPACES. The 'ALL WORKSPACES' link is highlighted with a red rectangle. Below the header, a sidebar on the left shows a 'Filter Pages' section with a dropdown menu containing 'Presentation - Home', 'Master Thesis Björn Michelsen', and 'Master Thesis Tobias Schrade'. The main content area shows a workspace titled 'Master Thesis Björn Michelsen' with a green circular icon and an 'EDIT' button. Below this, a second workspace header is visible with the text 'Complex, knowledge-intensive processes are becoming increasingly important for modern enterprises. The support of such'. At the bottom, a 'Workspaces' section lists four workspace types: Home Workspace, Northwind, Import, and Presentation, each with a vertical ellipsis menu icon to its right. The browser's address bar at the bottom left shows the URL 'localhost:8000/#/entities/tbpareur/bmo'.

**sebis**  
Fakultät für Informatik  
Technische Universität München

Search

Sebis Public Website | Student News | Research News | BEAMS | EAM Pattern Catalog | AK Unternehmens-Architektur

Filter Pages

- Team
- Research
- Publications
- Teaching
- Thesis & Guided Research
- Events
- Sponsors & Partners
- Career Opportunities
- Contact
- Datenschutzerklärung

## Master's Thesis Felix Michel

guided research | hauder | organic data science | collaboration | masterthesis | bpm | case management

### A Structured Task-Centered Framework for Online Collaboration

**Abstract**

Today's scientific research collaborations are often multidisciplinary across organizational borders and time-zones. Communication that is based on emails or teleconferences is time consuming. In recent years many approaches have focused on building and establishing on-line communities. Other approaches focus on managing effort such as organizing work as tasks. Collaboratively working teams could potentially increase their efficiency by combining the task centered approach with the community approach. However, no existing approach combines an on-line community platform and a task centered approach to provide an open collaboration process. This thesis presents the Organic Data Science approach which enables an open task centered on-line collaboration process. Key principles to address challenges of the task-centered collaboration approach are 1.) the self-organization of the community through task decomposition, 2.) an on-line community support based on social design principles and best practices and 3.) an open science process to enable unanticipated contributions. The task-centered Organic Data Science framework approach is implemented based on the Semantic MediaWiki platform. The prototype implementation of the Organic Data Science framework is evaluated through a research project focused on the science question of modeling the age of water in an ecosystem. This project requires expertise in different research areas from multiple organizations within different time-zones. Different collaboration dimensions are evaluated such as how many different users access a task, how many different users are assigned to a task, how many different users edit the task metadata and how many different users edit the task content. The findings show that the framework supports the collaboration process. In general the Organic Data Science framework is designed for helping scientists to collaborate to solve complex scientific research questions. The use of the Organic Data Science framework is not limited to scientific purpose, it helps to support complex knowledge intensive collaborative processes.

Student Project	
Attributes	Tasks
Sign Copyright Agreement	
Progress:	0%
Start Date:	15.07.2015
End Date:	22.07.2015
Owner:	Felix Michel
Expertise:	Management, Liability
Copyright agreement publication allowed	
Copyright agreement notification email	
Copyright agreement notification required	
Copyright agreement required	
<u>Attribute name</u>	<u>Attribute value</u>
Initial Presentation	
Kickoff presentation slides	

# Approach – Design Challenges – Tasks

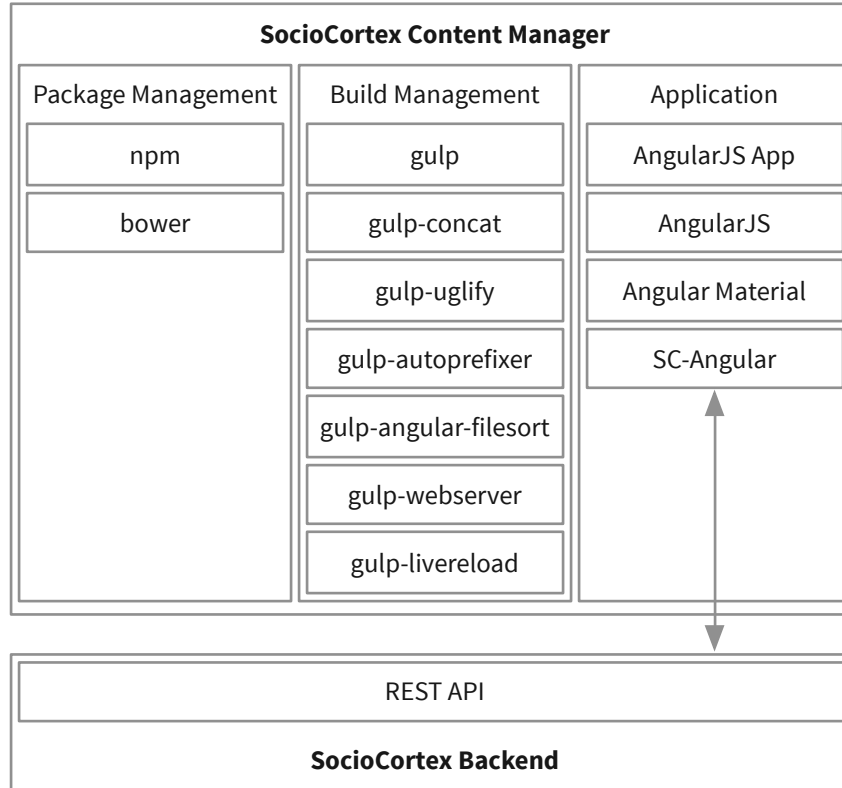
The screenshot displays the sebis web application interface. At the top, there is a search bar and navigation links for HOME WORKSPACE, NORTHWIND, SEBIS EVALUATION (which is highlighted), and ALL WORKSPACES. The left sidebar contains a 'Filter Pages' section and a list of pages: 'SEBIS Evaluation - Home', 'Implementation of a knowledge ...', 'Max Mustermann', and 'Test Master Thesis' (which is selected). The main content area is titled 'Test Master Thesis' and contains a 'New Abstract' section. On the right, there is a 'Masterthesis' panel with two tabs: 'ATTRIBUTES' and 'TASKS'. The 'TASKS' tab is active and shows a list of tasks:

Task Name	Progress	Start Date	End Date	Owner	Expertise
Conduct Evaluation	0%				
Define Thesis	33%				
Write Abstract	100%				

Below the tasks list, there is an 'Add new task' input field. At the bottom of the right panel, there is a 'Files' section with an 'UPLOAD' button.




- Use case specific design challenges
  - Workspaces
  - Tasks
- General design challenges
  - Material Design
  - Mockups





- **Requirements**
  - Open Source
  - Rich-Text
  - WYSIWYG and HTML View
  - Extendibility
  - Compatibility with AngularJS
  - Documentation
  - Cross-Browser Support
  - Active Development
- **Evaluation**
  - TinyMCE
  - Trix
  - Quill
- **Selection: TinyMCE**



Fakultät für Informatik  
Technische Universität München

🕒 👤 +

[HOME WORKSPACE](#) [NORTHWIND](#) [IMPORT](#) [PRESENTATION](#) [ALL WORKSPACES](#)

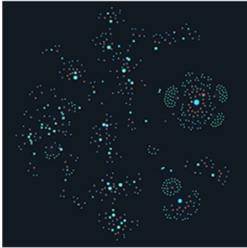
Presentation - Home

- Master Thesis Björn Michelsen**
- Master Thesis Tobias Schrade
- Text Page

## Master Thesis Björn Michelsen

EDIT

Complex, knowledge-intensive processes are becoming increasingly important for modern enterprises. The support of such processes through information systems yields a huge potential for their increased efficiency and effectiveness. SocioCortex, the social information hub, is one approach for such a collaborative information system. It builds upon the concept of hybrid wikis, an end-user-oriented way to create, store, and distribute knowledge in both un-structured and structured ways. It also aims to include task centered collaboration aspects. The idea behind SocioCortex is to provide a back-end as a basis for dedicated clients, for example for generic content and task management, modeling, or visualization. The objective of this thesis is the implementation of a web client for one of those use cases, the generic content and task management. The approach of this thesis is based on a review of existing work regarding hybrid wikis, task centered collaboration approaches and initial design and implementation examples of the content manager. Furthermore, the implemented result are evaluated through tests with enterprise stakeholders familiar with Enterprise Architecture Management (EAM).



### Master thesis

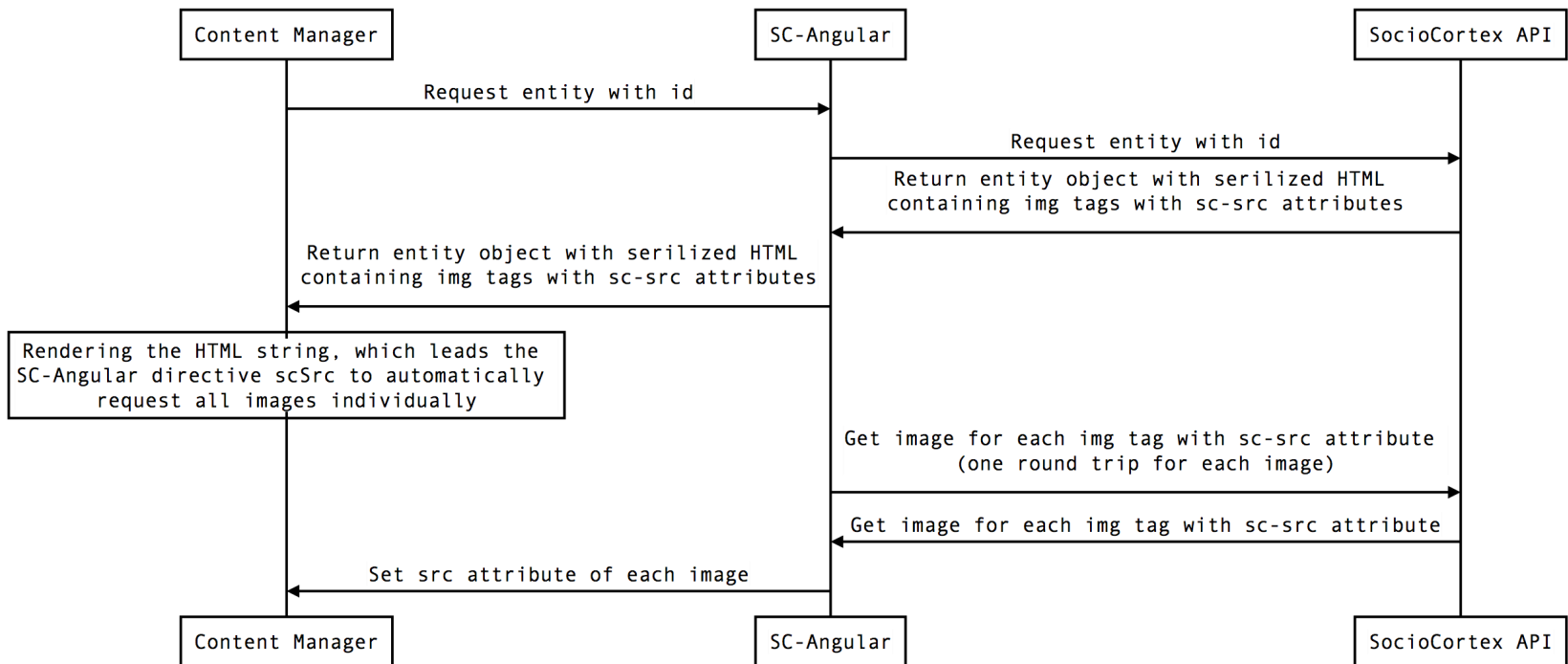
ATTRIBUTES	TASKS
Start Date <b>Mar 15, 2016</b>	⋮
End Date <b>Sep 15, 2016</b>	⋮
Abstract <b>Complex, knowledge-intensive processes are becoming increasingly important for modern enterprises.</b>	⋮
<input type="text" value="Add new attribute"/>	

### Files

graph.jpg

UPLOAD

localhost:8000/#/entities/1bparyeuribmo



- Same issues with links as with images
- Issues with the SoioCortex API - fetching too little too much data at a request
- Drawbacks in using AngularJS 1

- **Methodology**
  - ~ 30 min think out loud usability test using a live system of the content manager followed by questionnaire
- **Participants**
  - 6 participants in total
  - 3 from SEBIS chair
  - 3 industry partners
  - Every participant was familiar with EAM
- **Scenario**
  - Managing information at the SEBIS chair in the role of a Ph.D. student
- **Tasks**
  - Focus on managing content in the form of entities, entity content, attributes, and tasks.
- **Questionnaire**
  - System Usability Scale (SUS), 10 questions
  - 3 custom questions



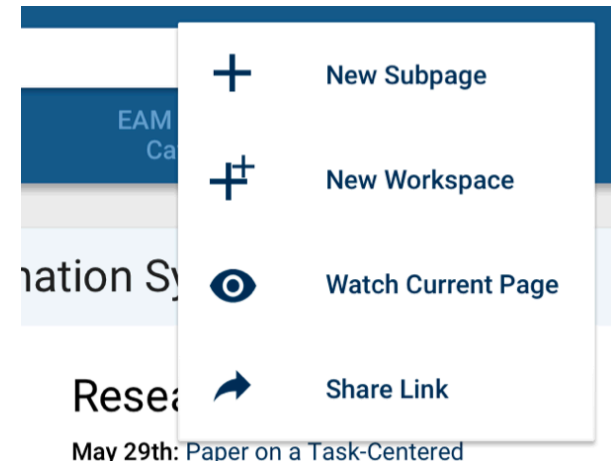
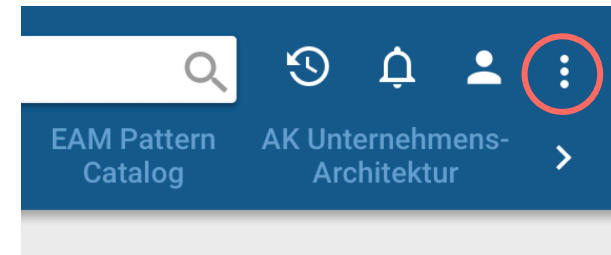
Question	User's Scale Position	SUS Contribution
I think that I would like to use this system frequently.	3,50	2,50
I found the system unnecessarily complex.	2,33	2,67
I thought the system was easy to use.	3,33	2,33
I think that I would need the support of a technical person to be able to use this system.	2,67	2,33
I found the various functions in this system were well integrated.	3,00	2,00
I thought there was too much inconsistency in this system.	2,17	2,83
I would imagine that most people would learn to use this system very quickly.	3,00	2,00
I found the system very cumbersome to use.	1,83	3,17
I felt very confident using the system.	4,00	3,00
I needed to learn a lot of things before I could get going with this system.	1,67	3,33
	<b>Average SUS Score (0-100)</b>	<b>65,42</b>

- **Findings from the SUS**

- Systems with a SUS score of at least **68** are considered to have a good usability. With an average of **65,42** the content manager scored slightly below that threshold.

- **General findings**

- **Entity creation process** can be improved
  - Low discoverability of entity creation function.
  - *Recommendation: Use floating action button pattern from Material Design.*
- **Attribute editing process** can be improved
  - Participants expected an edit-in-place behavior to make editing several attributes more easy.
  - *Recommendation: Allow setting all attributes of a page in edit mode at once.*
- **Naming of entities** can be improved
  - Participants expected the use of “entities” instead of “pages”.



Mockups for interaction design of creating entities.

**DEMO**

- **Improvements based evaluation results**
- **Design process**
  - Use a more rigorous user-centered design process
    - Testing of system functionality (e.g. wireframes, mockups, wizard-of-oz prototyping, click-prototypes) before implementation in a functional prototype
- **Technical implementation**
  - Move to Angular 2 or similar (ReactJS) to leverage benefits such as a component-based architecture and performance improvements.
- **Better integration of clients**
  - Integration between SocioCortex Content Manager and SocioCortex Modeler
  - Example: Navigating from entity in content manager to entity type in modeler
- **Integration of data tables**

Thank you for your attention.



**Björn Michelsen**  
B.Sc.



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

Boltzmannstraße 3  
85748 Garching bei München

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

# BACKUP

