



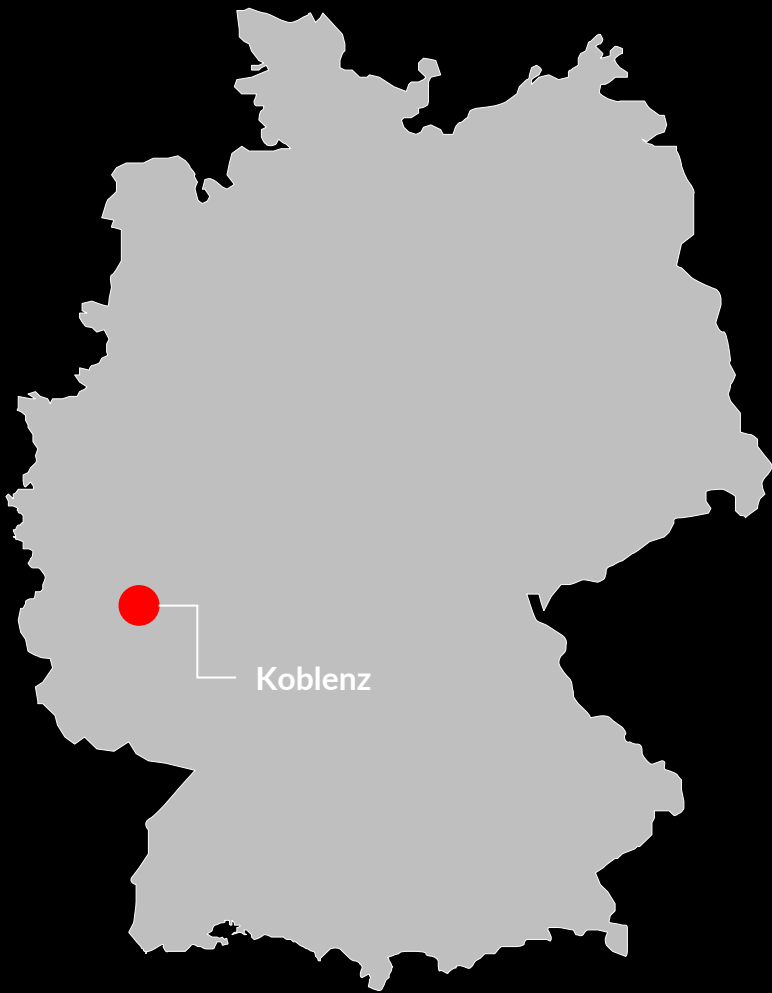
CEIR | Center for Enterprise
Information Research

Collaborative Actions On Documents Ontology (ColActDOnt)

CENTERIS – Session 6A

Martin Just & Prof. Dr. Petra Schubert – 2022-11-11





Germany 9'200 students 450 employees



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Systems



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Research Assistant
Ontology-based data
access



Cornelia Mc Stay
Team Assistant

INTRODUCTION

Typical Landscape: Heterogeneous Software

MS Zoo



HCL: Integrated Enterprise Collaboration System



Atlassian Suite



Google Suite



opentext™

And more...

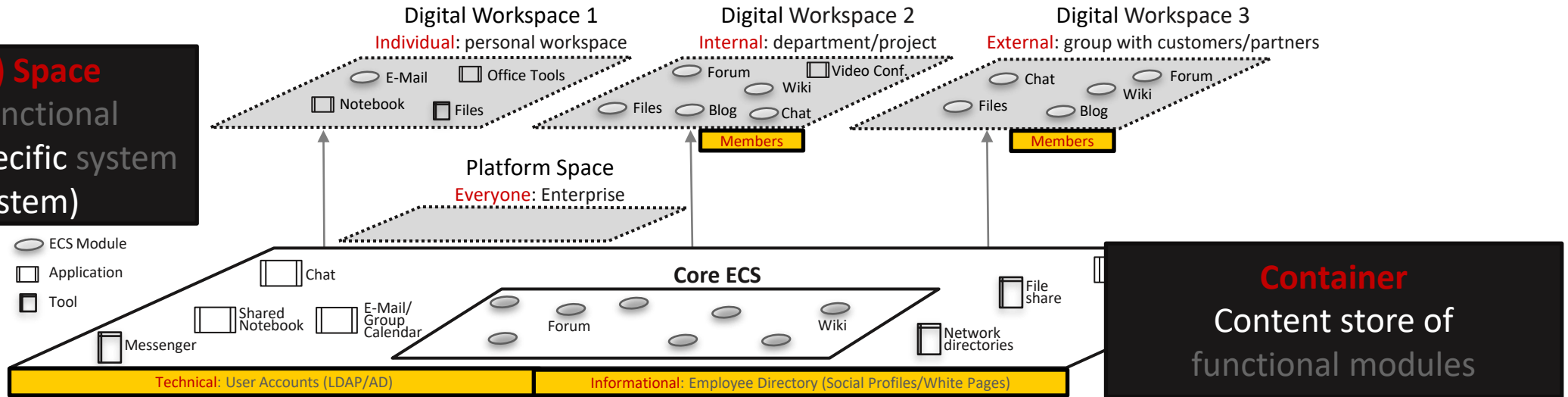


INTRODUCTION

Important Terms

Digital Workspace (DWS)
Combination of functional modules selected for a specific work group
(multi-system)

(In-system) Space
Bundle of functional modules in a specific system
(single-system)



System
A software product that provides functionality in functional modules
Provides spaces for groups
Comes with its own user directory (which needs to be linked to the central UD for SSO)
Proprietary logging format
Third party modules: functional modules are embedded in the system (e.g. HuddoBoards)

MOTIVATION

(Social) Process Mining

- **PM** has had success in process discovery, prediction and conformance checking in **process-aware** information systems (van der Aalst, 2009)
 - Few reports on successful applications of (Social) Process Mining (SPM) for collaboration software

Difficulty	References
<u>Heterogenous event log structure</u> and location	(van der Aalst, 2016; Kalokyri et al., 2017; Vianna et al., 2019; Diamantini et al., 2014)
Inherent malleability of collaboration systems, lack of standard templates/rules/procedures	(Williams et al., 2020)
No forced use of a specific tool, choice of tool selection for users, ad hoc usage	(Diamantini et al., 2014; Williams et al., 2020)
Understanding of event logs (underlying data)	(van der Aalst, 2016; Schwade et al. 2017)

- **Research Aim:** Overcome the lack of **common terminology** & to **harmonise the event logs**

RESEARCH DESIGN

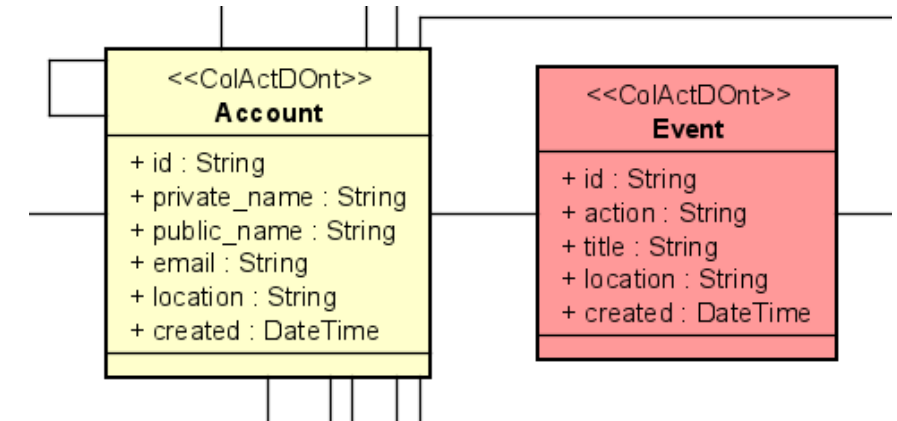
Design Science Research (Vaishnavi & Kuechler, 2008)

- **Structured literature review** in the fields of Process Mining and Enterprise Collaboration
 - Definition of the terms that were included in our ontology
- **Analysis** of leading collaboration software
- → Gain an understanding of existing event logs
- **Review** of existing ontologies in the field of Social Software
 - SocDOnt – Social Document Ontology (Williams et al., 2020)
 - FOAF – Friend of a Friend Ontology (Brickley & Miller, 2014)
 - OSCAF (including NCAL, PIMO and NUAO) (OSCAF, 2014)
 - TMO – Task Management Ontology (Brunzel & Grebner, 2008)
 - Find reusable concepts
- **Iterative ontology development** was based on the methodology of Noy and McGuinness (2001)
 - DSR artifact

COLACTDONT – COLLABORATIVE ACTIONS ON DOCUMENTS ONTOLOGY

What is an Ontology?

- An ontology is a "**formal**, explicit **specification** of a shared **conceptualization**" (Studer et al., 1998)
- **"formal"**
 - Usually **machine-readable**
 - Easy **application** and **reuse**
- **"Specification"**
 - **Terminology** and **Taxonomy** as a backbone
 - Includes generalisation and specialisation hierarchy
- **"Conceptualization"**
 - Abstract, **simplified view** of the world presented for a specific purpose



COLACTDONT – COLLABORATIVE ACTIONS ON DOCUMENTS ONTOLOGY

Purpose – Why do we need a harmonised Event Log?

- **Understand** collaborative user **activities** across (potentially multiple) collaboration systems
- Derive this information from data of each system → event logs & content data
- Questions:

- **Who** is involved?

- *Account & Agent*

Organisational

- **On what** *items* are actions performed?

- *IntellectualEntities, IntellectualComponents & SimpleComponents*

Content

- **Where** are these *items* stored?

- *Container, System & DigitalWorkspace*

- **Which actions** are **when** performed?

- *Event*

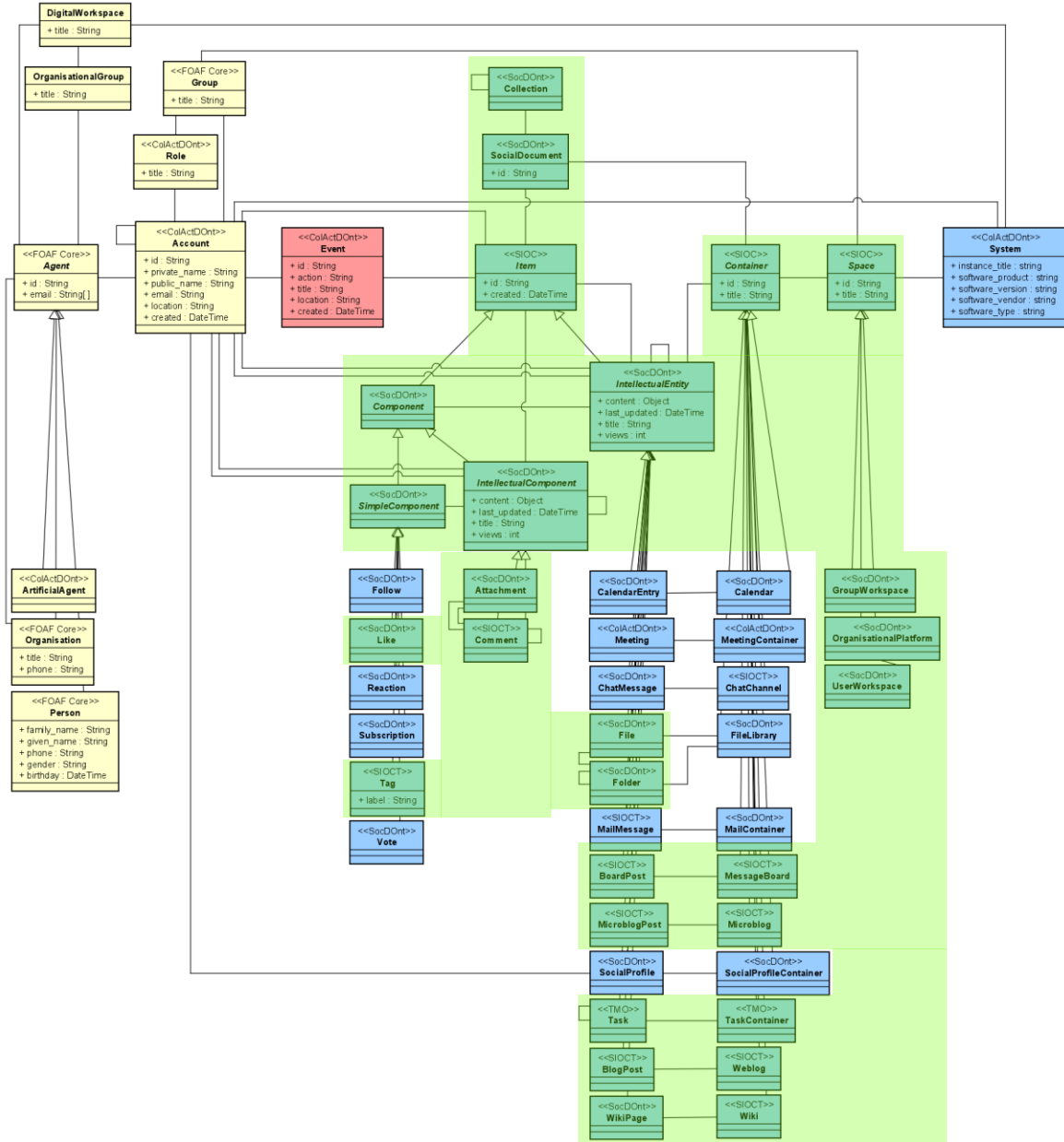
Transactional

■ SCA

(Schwade & Schubert, 2017)

COLACTDONT – COLLABORATIVE ACTIONS ON DOCUMENTS ONTOLOGY

Simplified Visualisation



Organisational

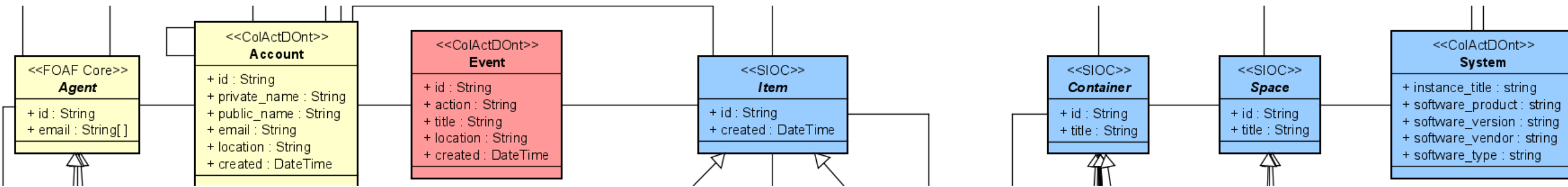
Transactional

Content

■ SocDont
(Williams et al., 2020)

COLACTDONT – COLLABORATIVE ACTIONS ON DOCUMENTS ONTOLOGY

Event Log related top Concepts



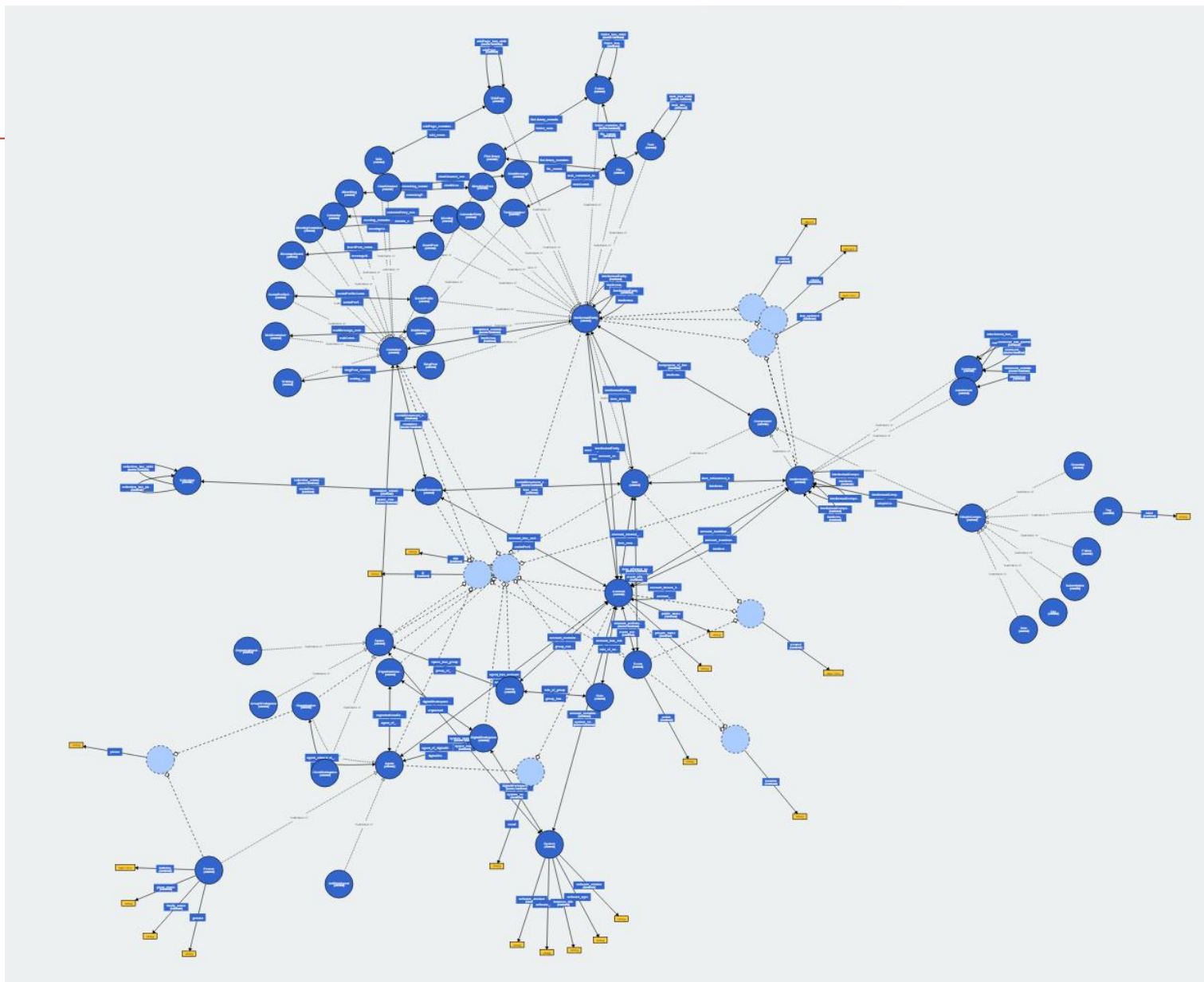
Organisational

Transactional

Content

COLACTDONT – COLLABORATIVE ACTIONS ON DOCUMENTS ONTOLOGY

WebVOWL



COLACTDONT – APPLICATION EXAMPLE

User Screen

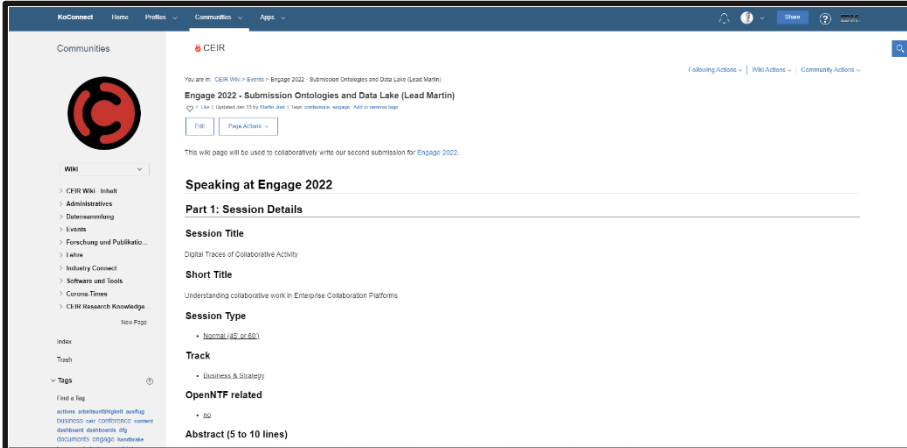
Social Document Graph

In-System Log

Collaboration Scenario

Harmonised Event Log

COLACTDONT – APPLICATION EXAMPLE



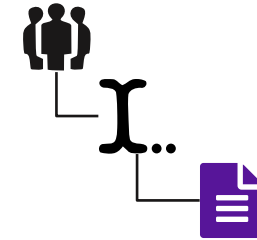
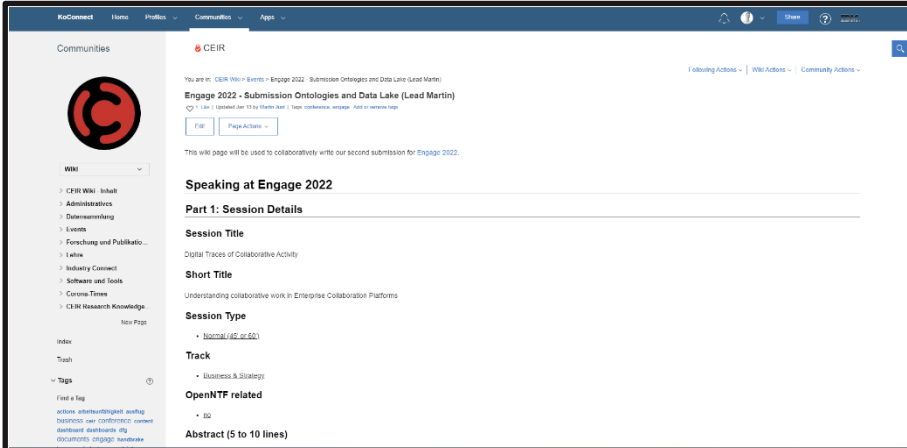
Social Document Graph

In-System Log

Collaboration Scenario

Harmonised Event Log

COLACTDONT – APPLICATION EXAMPLE



In-System Log

Collaboration Scenario

Harmonised Event Log

COLACTDONT – APPLICATION EXAMPLE

Communities

Engage 2022 - Submission Ontologies and Data Lake (Lead Martin)

Part 1: Session Details

Session Title

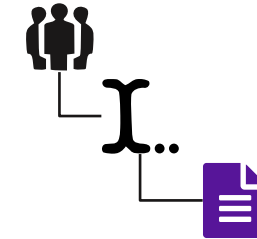
Short Title

Session Type

Track

OpenNMF related

Abstract (5 to 10 lines)



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Julian Meiss	94844700	ZTC	209F-C120-8188800DCA	16070000-5701-401a-0082-d0e80020809	FPDFW76	FP94-4012-9140-9F95d0c3807	16070000-5701-401a-0082-d0e80020809	Engage 2022 - Submission Ontologies and Data Lake (Lead Martin)	2022-01-11-11:11:40.5700000	432412

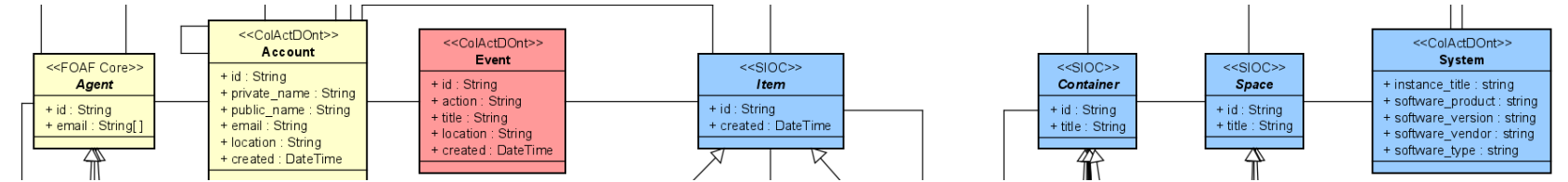
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1311			
1314			

Harmonised Event Log

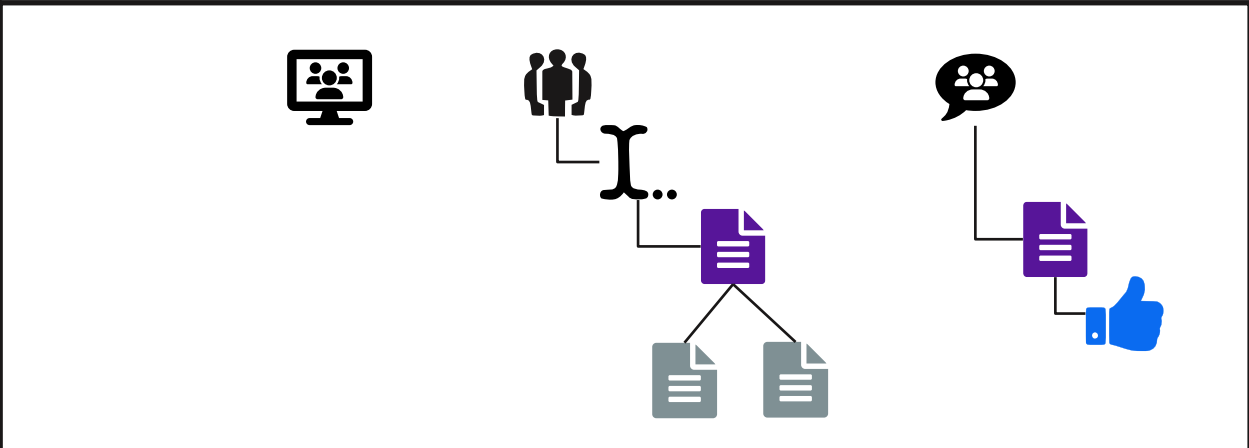
COLACTDONT – APPLICATION EXAMPLE

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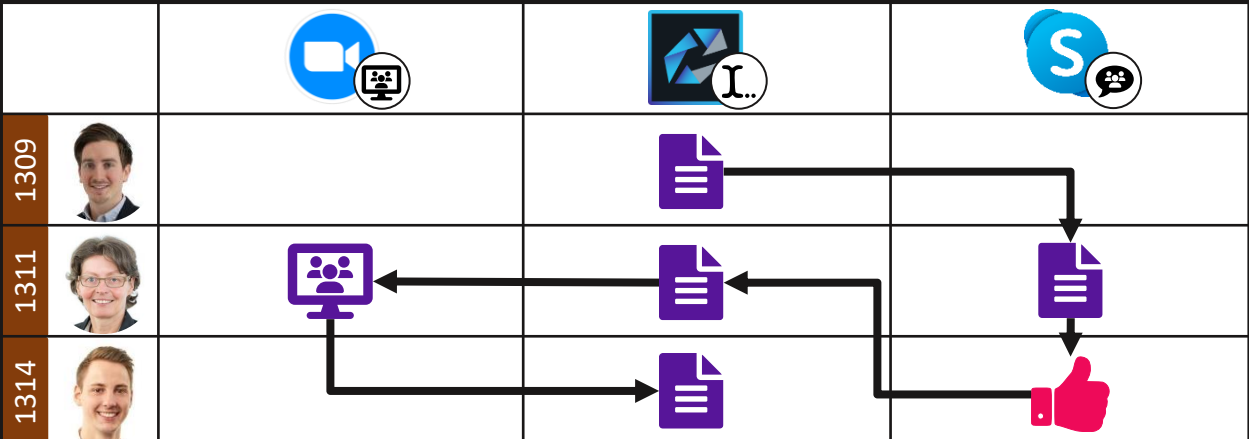
Julian(1309) .KoCo .GroupWorkspace(6b73) .Wiki(df2f) .WikiPage(cc3e) .CREATED_11.01.2022-T11:11:02.552+0(2412)



COLACTDONT – APPLICATION EXAMPLE



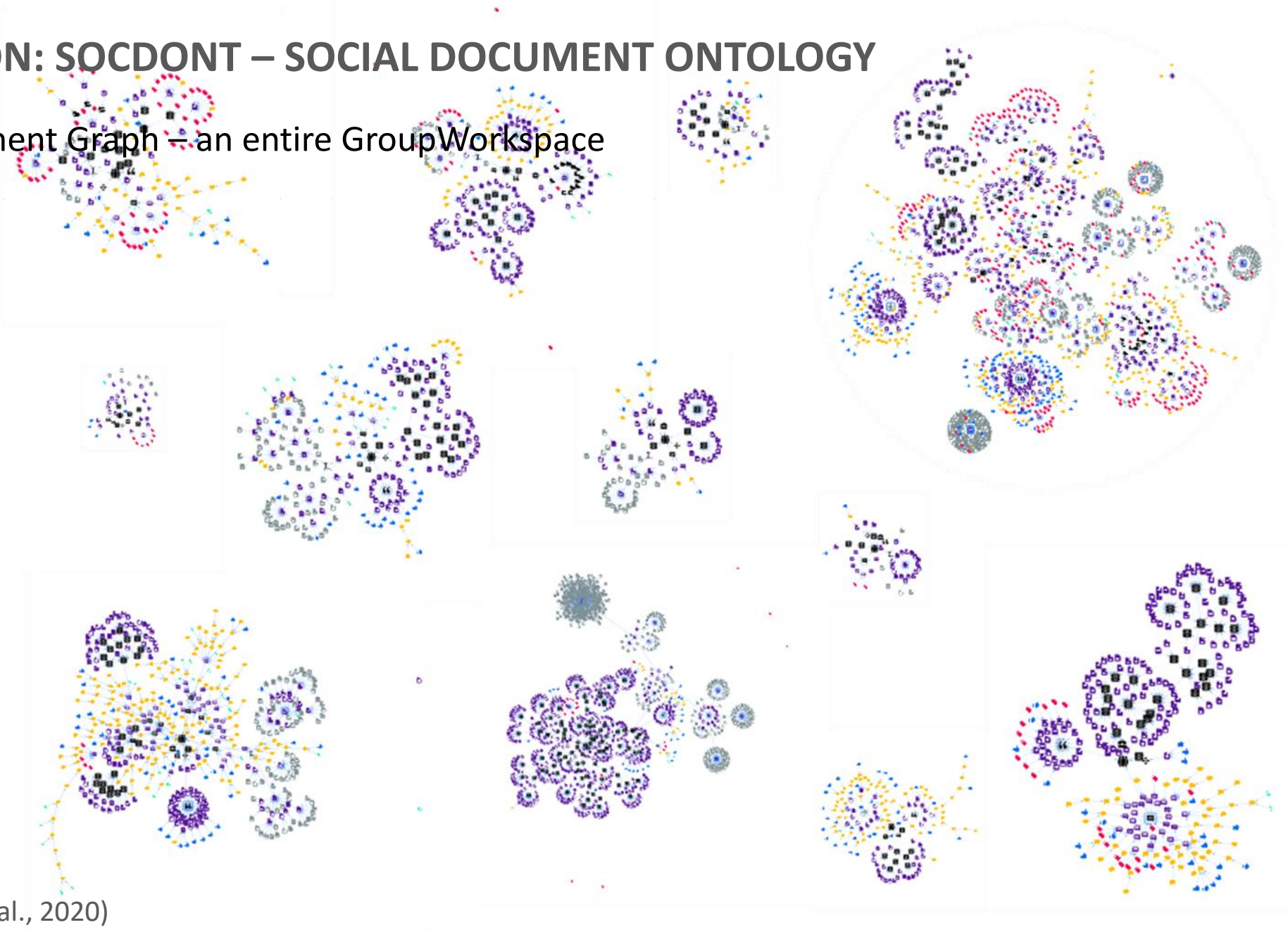
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Julian	1309	KoCo	6b73	Wiki	df2f	WikiPage	cc3e	Chair: Petra Schubert
Petra	1311	Skype	n.a.	ChatChannel	fd15	ChatMessage	1641	You have accepted this meeting invitation
Martin	1314	Skype	n.a.	ChatChannel	fd15	ChatMessage	1641	Location: No location information
Petra	1311	KoCo	6b73	Wiki	df2f	WikiPage	cc3e	Online Meeting
Petra	1311	Zoom	9410	MeetingContainer	n.a.	Meeting	n.a.	Call-in: Petra Schubert lädt Sie zu einem geplanten Zoom-Meeting ein. Thema: Physikalische Identifizierung von Petra Schubert
Martin	1314	KoCo	6b73	Wiki	df2f	WikiPage	cc3e	Meeting ID: 941 064 3460



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DIGRESSION: SOCDONT – SOCIAL DOCUMENT ONTOLOGY

Social Document Graph – an entire GroupWorkspace



■ SocDOnt
(Williams et al., 2020)

COLACTDONT – FORMAL SPECIFICATION

Ontologies & XES Extension available via permanent Identifiers



w3id.org/SocDOnt

SocDOnt - Social Document Ontology

IRI / Latest Version:

<https://w3id.org/SocDOnt> [JSON] [OWL/XML] [TTL]

Version IRI / This Version:

<https://w3id.org/SocDOnt/1.0> [JSON] [OWL/XML] [TTL]

Date:

01/2020

Current version:

1.0

Authors:

[Susan Williams](#), [Julian Mosen](#), [Petra Schubert](#)

Publisher:

[CEIR - Center for Enterprise Information Research](#)

Visualisations:

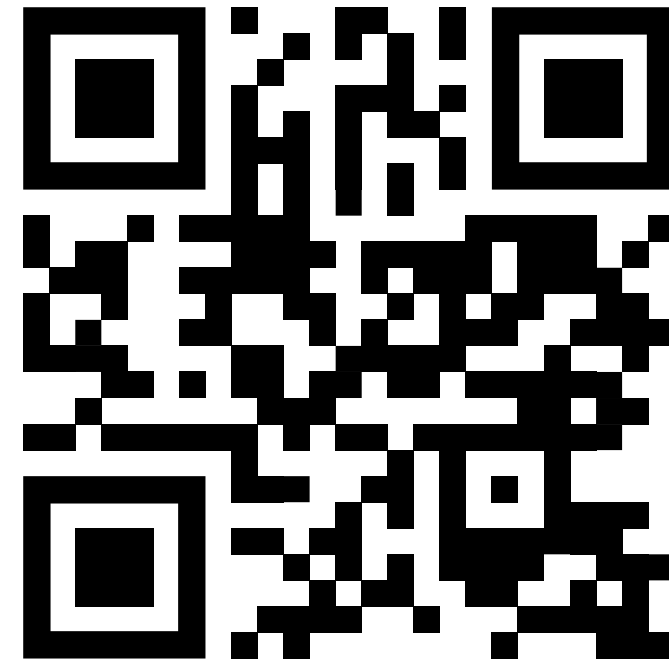
[PNG](#) - [SVG](#) - [WebVowl](#)

Publications:

[Williams, S., Mosen, J., & Schubert, P. \(2020\). The Structure of Social Documents. 53rd Hawaii International Conference on System Sciences, 2825–2834. - DOI: 10.24251/HICSS.2020.345](#)

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COLACTDONT – FORMAL SPECIFICATION

Ontologies & XES Extension available via permanent Identifiers



ColActDOnt - Collaborative Actions on Documents Ontology

IRI / Latest Version:

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Version IRI / This Version:

<https://w3id.org/ColActDOnt/1.0> [JSON] [OWL/XML] [TTL]

Date:

06/2022

Current version:

1.0

Authors:

[Petra Schubert](#), [Martin Just](#)

Publisher:

[CEIR - Center for Enterprise Information Research](#)

Visualisations:

[PNG](#) - [SVG](#) - [WebVowl](#)

XES Extension:

[Documentation](#) - [xesext](#)

Publications:

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w3id.org/ColActDOnt



CONCLUSIONS

- Collaboration “processes” are **ad hoc** and **rarely pre-defined** (unlike ERP)
 - Digital support of collaborative activity frequently spans across **multiple software products**
 - Record user activity in their own proprietary log format
 - Data needs to be transformed and aggregated before it can be used by PM tools
 - **ColActDOnt** addresses these difficulties
 - Novel approach for the **harmonisation** and **aggregation** of log files from collaboration systems
 - Specifies the concepts and properties of collaboration events → **common language**
 - “**Event**” is a **useful concept** for understanding user actions on documents
 - Ontology and XES Extension available in a **machine-readable** format
- Foundation for the identification of sequences (traces) in user activity
- **Enables** the **analysis** of cross-system collaboration
 - “Which action has a user (who) performed when, where and on what (document)?”

OUTLOOK

Future Research

- Application of the harmonised log format
 - **OBDA** – Ontology based Data-Access
 - Planning the development of a dedicated **log aggregator**
 - **SPM** – Social Process Mining

- Our call to action: We need an **applied** standard logging format (harmonised event log)

Thank you for your attention!



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