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The Use of Benefits Scorecards for Identifying and Measuring Benefits from Enterprise Collaboration Systems

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Agenda

- Background and motivation
- Research objectives
- Research steps & outcomes
- Conclusion

Background & motivation

- **Enterprise Collaboration Platforms (ECP):**
  - **Large-scale, highly integrated platforms** with a range of different collaboration tools that provide functionalities such as blogs, forums, wikis, or chats for supporting internal collaboration (especially communication, creation of content and coordination) [1]
  - **Integration** of independent **Enterprise Social Software (ESS)** and/or **Enterprise Collaboration Systems (ECS)** [2]
  - **ECS have** emerged as **core components of the digital workplace** [8-10]

- **Practitioners and researchers are striving to identify the benefits realized through the usage of ECS** [12,14,15]
  - **A benefit** is an improvement based on the adoption of ECS, perceived as positive by at least one stakeholder and contributes towards at least one organizational objective [21]
  - **System specifications significantly affects how it is used** as even minor differences between supposedly similar ECS lead to divergent measurement results [17,18]
  - **Behavior, mindset and and expertise** of its users have a significant impact on the realization of ECS benefits [19]
  - **No predefined usage patterns** for an ECS and employees use the system according to their individual beliefs, skills and experience [20]
  - Benefits realization of an ECS must be continuously monitored by analyzing **reactive and non-reactive data** [21]

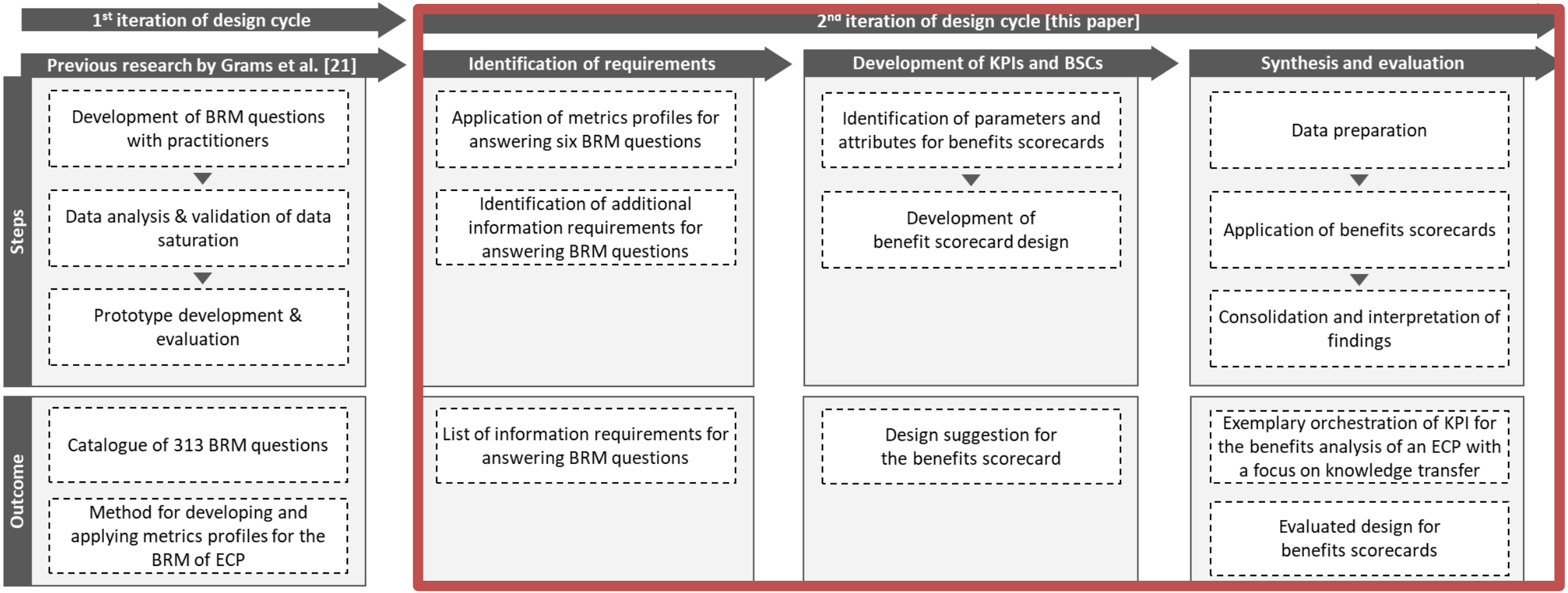
- **A deeper understanding is needed that allows the development of innovative metrics**

Research objectives

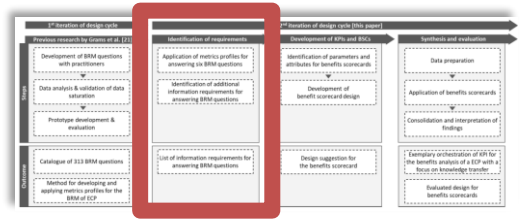
- The research objectives in this study are to
  1. **contribute to a broader understanding of the metrics-based analysis of benefits from ECS usage in organizations**
  2. **evaluate the novel method of Benefits Scorecards (BSC) using data from a large-scale operational ECS**
- This study builds on and extends the previous CENTERIS paper written by Grams et al. [21]
- **Funded by the Deutsche Forschungsgemeinschaft** (DFG)

Research design

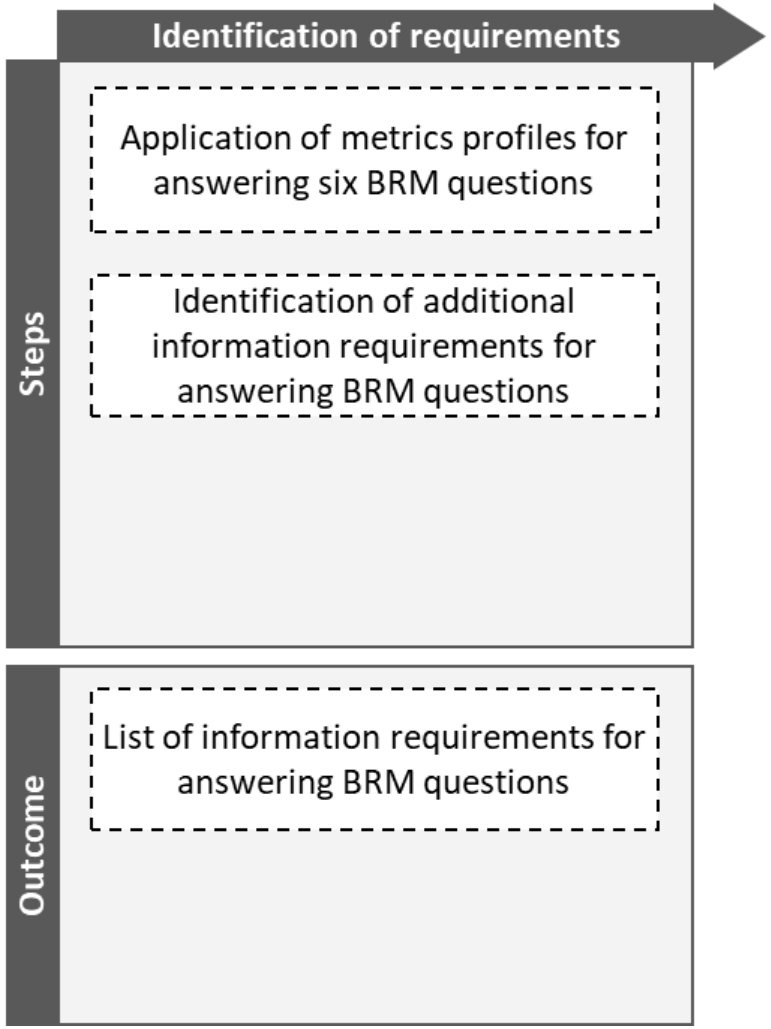
Figure 1: Research Design



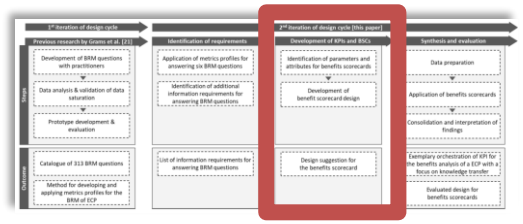
- Second iteration of a multi-stage design science research approach [18]
- Development of **Benefits Scorecards** as an extension of Grams et. al [19]



Identification of requirements

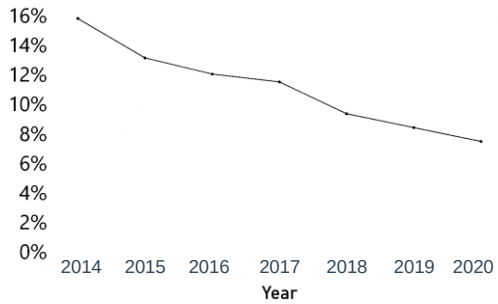


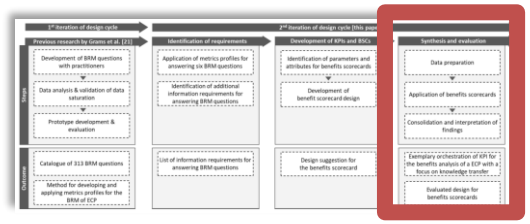
- Several metrics profiles to develop the quantitative answers to questions from the benefits question catalogue of Grams et al. [21] were prepared.
- The metrics profiles of Grams et al. [21] were not sufficient to organize the full process of answering all divergent question.
- This became apparent, for example, when reactive data from a survey were to be analysed.
- Benefits measurements from which no actions or decisions can be derived to maintain or increase a benefit are not sufficient for the benefits management process [2].
- Based on these preliminary findings, the first tentative design of the Benefits Scorecards was developed.
- Application of design process, which is described by Vaishnavi & Kuechler [23] as a creative step in DSR that is based on the collected knowledge and experience of the researcher.



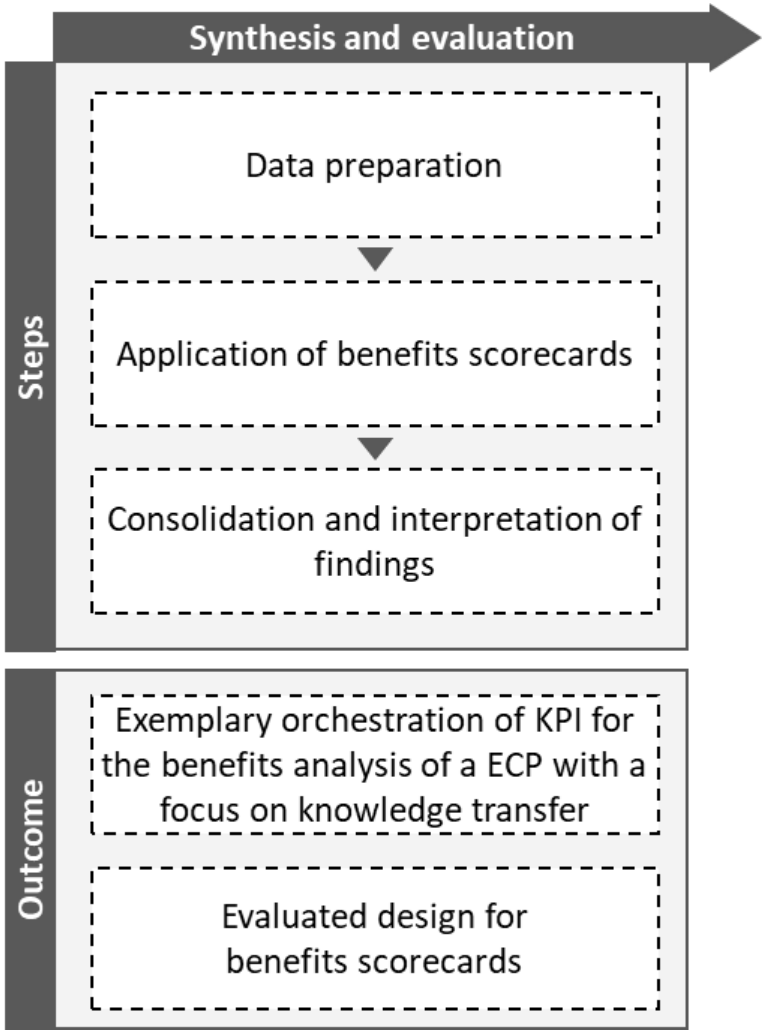
Development of KPI and BSCs

Table 3: Exemplary Benefits Scorecard

Question	[F0093] What is the proportion of workspaces in which at least two users work across departments?											
Question category	**Benefit**	Usage	Socio-tech. change				UX & usability				Dis-benefit	
Question sub-category	**Transfer of knowledge**	Communication	Onboarding of new employees	Employee satisfaction	Networking	Personal Information Management	Search for people	Innovation	Attractiveness as an employer	Information availability	Agility	Monetary aspects	...
Measured variable	Workscpace ID		**Social Document ID**				User action ID			User ID	Time	...
Measurement unit	**Percent**	Workspaces		Social Documents				Hours		Unique users		...
Algorithm	i,n ∈ ℕ\{0} IDWi ∈ {0,1} IDW is the ID of a workspace n is the number of IDW z ∈ {0,1}, where 1 =“true"; 0 = “false” z_i is the characteristic of the i-th IDW: *In the past, at least one user, who is not the creator of the initial intellectual core element of one social document within this workspace and who works in a different department from the creator of the same social document, performed at least one collaborative action directly on the core element or on at least one associated component of the same social document.* ACaZ is the proportion of workspaces with cross-departmental collaboration $\mathrm{ACaZ} = \frac{1}{n}\sum_{i=1}^{n} \mathrm{IDW_i}$, where $\begin{cases} \mathrm{IDW_i} = 1, \text{ if } z_i = 1 \\ \text{or} \\ \mathrm{IDW_i} = 0, \text{ if } z_i = 0 \end{cases}$											
Data collection method	**Indirect observation of users based on their digital traces**	Direct observation of employees using the ECP					Focus group			Survey		...
Data collection instrument	Online questionnaire	Paper-based questionnaire		Tracking software	**Business application**		Interview			Sensor		...
Data source	Completed questionnaire	**Collaboration system**		ERP system	EIM system	E-learning system	LDAP	Recordings		Measurement system	Notes	...
Reactivity of data	Reactive						**Non-reactive**					
Data type	Scale	Single-choice		Multiple-choice	Comment	Numeric entry	Sensor data	**Content**		**Organisational data**	Logfile data	...
Measurement result	As of 11/29/2020, cross-departmental work on social documents was identified in 7.51% of workspaces.											
Visualization	Bar chart	**Line chart**		Pie chart	**Table**		Single number			Bullet graph		...
												
	Year / Result 2014 15,84 % 2015 13,17 % 2016 12,08 % 2017 11,54 % 2018 9,39 % 2019 8,45 % 2020 7,51 % **Total 7,51 %**											
Interpretation	The work in an ECP is done on social documents, consisting of an intellectual core element and several components (e.g. comments, likes, versions etc.). The measurement result is the proportion of workspaces to which belongs at least one associated social document that has one component that has been added by at least one user who is not the creator of the initial intellectual core element of this social document and who works in a different department than the creator of its core element.											
Target value	Approx. 5% by the end of Q4/2020											
Target value achieved	**Yes**						No					
Key factors for this result	Since 2017, when acquiring and onboarding new professors and lecturers on UniConnect, it has been explicitly emphasized that UniConnect supports cross-departmental collaboration between research groups and that this can be seen as an advantage over other tools. However, the majority of workspaces are used to support teaching (uploading of materials for the students), where cross-departmental cooperation is usually not required.											
Action derived	In terms of communication, the possibility of cross-departmental cooperation will be emphasized and less focus is placed on teaching support, in which cross-departmental cooperation is rarely required.											



Synthesis and evaluation



- The benefits scorecards were evaluated by applying them for answering six benefits questions listed in the question catalogue by Grams et al. [21] and relate to improvements in knowledge transfer between individuals or between groups

Benefits question	Benefits scorecard ID	ID of KPI	Developed KPI	Reactivity of data	Derived statement used in the survey on UniConnect	Measurement result for UniConnect in percent
What is the proportion of workspaces in which at least two users work across departments?	S0028	ACaZ	Proportion of workspaces with cross-departmental collaboration	Non-reactive	-	7.5
What percentage of users knows how social documents can be shared with other users?	S0031	ABeKT	Percentage of users who can share social documents with other users	Reactive	I know how to share content on UniConnect with other users.	87.5
What percentage of users finds sharing information generally useful and wants to share it with other users?	S0035	ABMoT	Percentage of users who consider sharing information to be generally beneficial and want to share their own social documents with other users	Reactive	In general, I find sharing information with other users of UniConnect beneficial, and I would like to share information on UniConnect with them.	90.2
How high is the proportion of social documents that are recommended?	S0033	ADoW	Percentage of social documents with at least one recommendation as component	Non-reactive	-	10.1
What proportion of the social documents is tagged?	S0034	ADoT	Percentage of social documents with at least one tag as component	Non-reactive	-	15.4
What is the proportion of users who find it beneficial for their own work to share their own documents with other users?	S0032	ABPoT	Percentage of users who find social document sharing beneficial for their own work	Reactive	Sharing content on UniConnect with other users is beneficial for my own work.	91.7

- The non-reactive data is extracted from the operational collaboration system UniConnect and analyzed by using dashboards built with Microsoft PowerBI.
- The non-reactive data is generated via a survey with UniConnect users to analyze their perception in regards to benefits realization.
- Such an individual orchestration of benefits scorecards represents an exemplary structure of an indicator system for the benefits analysis of ECS

Conclusion & future work

- The demonstrated application of the BSC shows how metrics can be successfully developed in a structured way, based on both reactive and non-reactive data, to analyze the benefits of an ECS quantitatively.
- The method of the Benefits Scorecards is an extension of existing methods that support indicator-based benefits measurement.
- Evaluation of the Benefits Scorecard (the artefact in our Design Science Research) as suggested by Vaishnavi & Kuechler [23].
- Data collection from distributed software components requires a complex undertaking requiring expert knowledge that is not available in every company.
- Cloud-based or hybrid solution for ECS can result into a limited access to log files and system data
- Next step: Benefits measurement in an operative ECS of a company

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Thank you for your attention

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