Green BPM Solutions for Sustainable Business Processes

Finn Klessascheck[1,2,*]

[1]Technical University of Munich, School of CIT, Heilbronn, Germany
[2]Weizenbaum Institute, Berlin, Germany

Abstract

For addressing environmental impacts brought on by business activities, and for complying with various environmental regulatory frameworks, companies increasingly need to ensure that their business processes are *sustainable*. *Business Process Management* (BPM) as a discipline, concerned with analysing and improving business processes, is ideally positioned to help companies achieve this. Consequently, *Green BPM* has gained relevance in research and practice. However, several issues, such as a lack of approaches that use holistic indicators for sustainability, missing support for compliance monitoring with sustainability regulations, and barriers to the adoption of solutions in practice, limit the potential of Green BPM for achieving sustainability outcomes. To address these challenges, we therefore investigate how different notions of sustainability can be embedded into technical artifacts, and how solutions are developed and provided in practice. This paper presents the progress of our doctoral research so far, outlines the overall research method, outcomes, results achieved and remaining steps, as well as potential limitations.

Keywords

Green BPM, Sustainability, Conformance Checking, Process Analysis and Re-Design, Green BPMS

1. Introduction

Environmental concerns — such as climate change, threats to biodiversity, and resource overuse — play an increasing role across all aspects of human life, especially in business and organizations [1, 2]. In light of this, companies increasingly need to ensure their business practices are *sustainable*, i.e., they serve to meet the needs of the present without hindering future generations to meet their needs [3]. With companies facing both regulatory and societal pressures [4], approaches are needed so that companies can move their business processes towards being more sustainable. In particular, the field of *Business Process Management* (BPM), concerned with analysing, implementing, and improving business processes to achieve e.g. cost reductions, regulatory compliance, or improved efficiency [5, 6] has been extended towards *Green BPM*, in order to additionally take environmental concerns into account [7, 8].

However, it has not been conclusively settled in the sustainability literature what sustainability generally entails [9]: The most prevalent model of sustainability, the *triad* model, recognizes that sustainability combines interlinking *social*, *economic* and *environmental* dimensions [9], whereas other definitions foreground environmental aspects which dominate over social and economic concerns [10]. This dichotomy between *weak* (i.e. focussed on *conserving* the environment so that it better serves human interests such as value generation) and *strong* sustainability (i.e. focussed on *preserving* the environment due its intrinsic value) [10, 11, 12] has implications for how technical solutions for making business processes more sustainable are designed and implemented, both in research and in practice.

Companies need to be able to apply these technical solutions in a way that is both compatible with their objectives *and* that leads to actual sustainability outcomes — regardless of whether a notion of weak or strong sustainability is embedded into a tool and intended as the outcome of its application. Notably, existing regulations that aim to incentivize companies to move towards sustainable business practices commonly do so from a position of weak sustainability — see e.g. the *EU Taxonomy for*

Proceedings of the Best BPM Dissertation Award, Doctoral Consortium, and Demonstrations & Resources Forum co-located with 23rd International Conference on Business Process Management (BPM 2025), Seville, Spain, August 31st to September 5th, 2025
*Corresponding author.
finn.klessascheck@tum.de (F. Klessascheck)
0000-0001-6961-1828 (F. Klessascheck)
© 2025 Copyright for this paper by its authors. Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

CEUR-WS.org/Vol-4032/paper-04.pdf

CEUR Workshop Proceedings ceur-ws.org ISSN 1613-0073

Sustainable Activities [13, 14] and its underlying notion of *sustainable development*, which has been described as hindering the achievement of "actual" sustainability [9, 15].

While technical solutions situated in Green BPM (such as *Green BPMSs* as extensions of traditional *Business Process Management Systems* (BPMSs) [16]) have been proposed both from research and from industry, several issues remain: ① Existing approaches for analysing and redesigning business processes lack *holistic* indicators that consider a wide range of environmental indicators, but instead focus on i.a. carbon emissions, energy use, and water. This brings the danger of seemingly improving business processes for these dimensions, while deterioration along broader dimensions, e.g. ocean acidification, human and ecotoxicity, remain invisible [2]. Further, oftentimes a trade-off between economic costs and environmental impact is suggested. This limits the degree to which these approaches can contribute towards strong sustainability. ② While regulations that describe when exactly business practices contribute to weak sustainability goals have been emerging, so far, it is unclear how they can be operationalized for monitoring business processes for their compliance in a data-driven way, e.g. via *conformance checking* (see [17]); so far, companies use largely manual approaches for this [18]. ③ Emerging commercial technical solutions (Green BPMSs in particular) have experienced limited adoption in industry; therefore we need to understand barriers, the notion of sustainability (i.e. either weak or strong) embedded therein, and how this notion is formed (i.e. which pressures lead to the adoption of one or the other notion) and perceived during development and provision of solutions such as Green BPMSs. Note also that sustainability initiatives that do not consider alternative views on sustainability that employees can hold may be challenged and not accepted [19]. Consequently, we ask the following *research questions* (RQ):

RQ1: How can the environmental impact of business processes be measured and improved *holistically*, to provide a technical solution for achieving strong sustainability?

RQ2: How can the *compliance* of business processes with sustainability regulations that represent weak sustainability be ensured?

RQ3: How are notions of sustainability translated into software solutions for sustainable business processes in industry, and what resulting factors that hinder their development and provision in practice?

To address these research questions, we adopt an overarching *mixed-methods* research design [20], in which we combine 1) *Design Science Research* (DSR) [21] as a methodology for understanding organizational problems through the creation and evaluation of (technical) artefacts [22], with 2) empirical inquiry into the pressures, tensions, and views on sustainability around Green BPMSs and their provision and adoption via an *interpretative multiple case study* [23, 24, 25, 26]). On the one hand, this allows us to generate *design knowledge* on technical solutions for explicitly integrating two different notions of sustainability (i.e. weak and strong sustainability) into Green BPM. On the other hand, we also make a *theoretical contribution* [27] regarding the development and use contexts of Green BPMSs, and outline angles for overcoming barriers to adoption stemming from tensions around notions of sustainability. Figure 1 provides a conceptual overview of our area of inquiry.

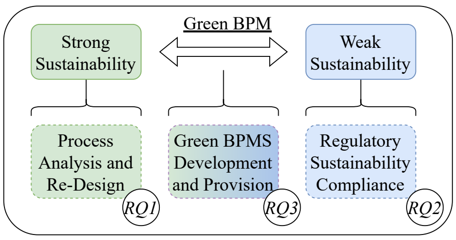

Figure 1: Schematic overview of the context and intended contributions of the doctoral project

The rest of this paper is organized as follows: In Section 2, we briefly review the literature on Green BPM that is related to our research project. In Section 3 we present the overarching research method, and in Section 4 we discuss intended outcomes. Then, in Section 5, we present results achieved so far, and the remaining steps of the research project. Finally, we discuss the contributions and threats to them in Section 6.

2. Related Work

Our research project is situated mainly in relation to existing studies on Green BPM. In general, the Green BPM literature already provides a rich body of knowledge on which we build. In particular, for making business processes more sustainable, Green BPM provides mechanisms across multiple *capability areas* of BPM, such as *modelling*, *deployment*, *optimization*, and *management* [7, 28]. *Modelling* capabilities include i.a. guidelines for modelling business processes so that their execution causes less environmental impact [29], or notations for representing the consumption of resources or emissions in process models [30, 31]. *Deployment* capabilities include approaches for measuring and controlling emissions [31, 32, 33], where usually a limited set of environmental indicators is used. This also includes the use of conformance checking to compare process executions against patterns for more sustainable business practices [29, 34]. *Optimization* capabilities include approaches for benchmarking process-redesigns for their environmental impact [35]. Finally, *management* capabilities serve to extend concepts such as the business process life cycle with concepts of sustainability [28]. Besides these technical or theoretical contributions, studies regarding adoption of Green BPM remain relatively sparse. For instance, [36] find that Green BPM adoption is influenced by company size and competitiveness. As another example, [37] find that better improving profitability, competitiveness, and company image, are benefits expected of and realized with Green BPM adoption.

In general, what sustainability means for Green BPM is usually formulated in line with the triad model or "sustainable development" [7, 28, 38], but it is usually not made explicit that this constitutes weak sustainability. Therefore, we see the need to develop useful Green BPM solutions with explicit positioning regarding weak vs. strong sustainability, and investigate how industry practice for providing Green BPMSs deals with tensions around this, to outline how barriers of adoption for these solutions can be addressed.

3. Research Methods

From a methodological point of view, the research questions require two distinct ways of being addressed, which we combine via a *mixed method* approach [20]. This allows us to cover multiple points of inquiry, each with a specific, appropriate method, thereby extending the breadth of our research. Since we aim to address different angles regarding the integration of sustainability and sustainability-specific software artefacts into Green BPM, this choice of method is appropriate.

For **RQ1** and **RQ2**, we adopt a *DSR* methodology [21, 39], and develop two separate artefacts, which embed different notions of sustainability. First, we develop and evaluate a formal framework that integrates holistic indicators for environmental impact into BPM in a way that allows business process analyses and re-design without suggesting economic trade-offs and without falling into a notion of weak sustainability. Second, we develop and evaluate an approach for making use of constraints of sustainability regulations, in particular, the EU Taxonomy, which embody weak sustainability. For evaluating both contributions, we follow existing methodological guidelines and apply the artefacts in single-case mechanism experiments (i.e. artificial ex-post evaluations) to investigate them in real-world adjacent settings, thereby illustrating their usefulness [39, 40, 41].

For **RQ3**, we conduct an *empirical-interpretivist case study* with vendor companies in the context of Green BPMSs, where we investigate stakeholder pressures that influence how sustainability is embedded into Green BPMSs, and how tensions regarding this notion are addressed during provision and use [23, 24, 25, 26]. Particularly, we try to understand how individuals, such as sustainability experts, software engineers, managers, or consultants, relate to sustainability as embedded in a Green BPMS. As an analytical lens, we plan to adopt the theory of *institutional logics*, as it provides a useful angle for understanding how and why members of an organization act to achieve goals and ascribe meaning to their actions [42, 43, 44]. So far, the theory has not been applied in a Green BPM context, but rather in BPM research more broadly [45] and in *Green IS* research, e.g. to describe how tensions between market and environmental goals impact the use of information systems for sustainability purposes [44].

4. Intended Outcomes

The overall outcomes of the research programme outlined herein will be three-fold: For **RQ1**, we propose a formal framework that can be used to implement concrete software systems for business process analysis and re-design with a notion of strong (environmental) sustainability. For **RQ2**, we propose a method with which Green BPM approaches in general, and compliance monitoring in particular, can be used to either improve or check adherence to sustainability regulations (via conformance checking based on recorded process executions in *event logs* [46, 17]) such as the EU Taxonomy. This includes steps to be taken in order to ensure that information required by relevant regulatory sustainability constraints is present or enriched into an event log. For **RQ3**, we generate insights into the stakeholder pressures that shape how sustainability is integrated into Green BPMSs, tensions arising from this, and how they are dealt with during development and use. From this, we derive impulses for how the adoption of Green BPMSs can be improved. In combination, the outcomes present an extension of existing work on Green BPM by making notions of sustainability explicit for developing useful artefacts, and by extending our existing understanding of how the development and use of Green BPMSs is realized. On a larger scale, we take up the call of needing to do "process science for good" [47] — in this case, enabling sustainable business practice — by providing two practically applicable artefacts for holistic, respective regulatory, environmental sustainability, and by investigating how organizations deal with notions of, and tensions around, sustainability when providing Green BPMSs.

5. Results and Roadmap

So far, we have achieved the following results regarding the overarching research questions:

First, addressing **RQ1**, we have proposed *SOPA* as a framework for sustainability-oriented process analysis in [2], where we combine Life Cycle Assessment (LCA) [48] with business process simulation to enable process analysts to evaluate and re-design business processes for their environmental impact. LCA is used to quantify the environmental impact of individual cost drivers, such as entities involved in activity instances like packaging material, or other factors such as shipping a certain parcel over a specific distance. In contrast to existing Green BPM optimization approaches, which focus on a small subset of environmental indicators, LCA can aggregate these cost drivers into single unitless (holistic) indicators that encompass a broad range of dimensions of environmental impact [48]. We have additionally implemented and integrated SOPA into existing tooling for managing and executing business process simulation scenarios [49, 50], and evaluated SOPA with a prototypical implementation and a case study. We plan to further refine the way LCA is used for impact assessment by additionally parametrising calculations, to allow for dynamic, probabilistic variations during process simulation.

For **RQ2**, we have: 1) investigated the EU Taxonomy as one instance of sustainability regulations for the kinds of process constraints contained therein [18]; 2) investigated in how far concepts of the EU taxonomy can be fruitfully integrated into Green BPM, and how Green BPM approaches can be leveraged to check for and increase alignment with the EU Taxonomy [51]; 3) investigated a widely adopted process analysis information system for in how far the information it contains is related to sustainability indicators, and found a need to enrich event data with environmental indicators for verifying EU taxonomy alignment in a data-driven manner [52]; 4) investigated previous uses of conformance checking for regulatory compliance monitoring and found that the use of sustainability regulations has not yet been addressed, and that a general approach for how event data is used and enriched is missing, especially regarding sustainability regulations [46, 53]. We plan to propose and evaluate an overarching approach for how constraints of the EU taxonomy can be used to enrich and check conformance of existing event logs.

For **RQ3**, we have so far conducted several interviews (≈10) with relevant stakeholders from various case companies that provide or implement Green BPMSs, and have gathered additional case documents (≈15) such as publicly available customer testimonials and vendor material. Currently, we are in the process of conducting further interviews and analysing the gathered data; we plan to finalize our analysis soon.

In the following, we briefly outline the remaining steps to be addressed in the dissertation project:

- Q2 2025
  - Integrate a technical implementation of SOPA into a Business Process Engine (RQ1)
  - Parametrise cost drivers in SOPA to allow for dynamic, probabilistic simulation of variations in environmental impact (RQ1)
  - Outline approach for event log enrichment in light of EU Taxonomy constraints (RQ2)
- Q3 2025
  - Wrap up DSR evaluation of contributions made in Q2 2025 (RQ1,RQ2)
  - Wrap up empirical study on development and provision of Green BPM tools (RQ3)
- Q4 2025
  - Complete overall research project, finish dissertation

6. Discussion and Conclusion

While the research project outlined herein aims to address three open challenges in Green BPM, being a lack of useful solutions that embody strong sustainability or that help in moving business processes towards sustainability compliance, as well as a lack of understanding regarding the development and provision of Green BPMSs, there are nonetheless limitations to address.

First, the research in general focus on environmental sustainability exclusively, which can be seen as "reductionist", and has been met with some critique [54]. Environmental sustainability as a *societal and political project* can lose priority, and thereby threaten the relevancy of our work. However, in light of existing research on Green BPM and the continuation of climate change, we believe this research to still be important. Second, the two artefacts developed, while being useful, may face challenges when their mechanisms are to be transferred into other contexts, e.g. into industry — also due to the nature of the artificial ex-post evaluations. Nonetheless, by supplementing them with an empirical study that sheds more light on organizational practice and individual stances that impact Green BPM tools and their provision, we could inform a further design and evaluation iteration for future work. Finally, given the limited adoption of Green BPMSs so far, our case study may not be able to reach saturation and sufficient samples (see e.g. [55]). Still, we believe that the rather exploratory approach we chose, and the additional case material we supplemented, can counter this threat.

In brief, we believe that, once concluded, the findings of the research outlined herein contribute towards the existing state of the art of Green BPM by providing novel mechanisms for sustainable business practices on the one hand, and better understanding of how they can be fruitfully translated into practice on the other.

Acknowledgments

Finn Klessascheck's research was partially funded by the DFG (German Research Foundation) – Grant no. 465904964.

Declaration on Generative AI

The author(s) have not employed any Generative AI tools.

References

[1] S. Seidel, J. Recker, J. Vom Brocke, Green Business Process Management, in: J. vom Brocke, S. Seidel, J. Recker (Eds.), Green Business Process Management, Springer Berlin Heidelberg, Berlin, Heidelberg, 2012, pp. 3–13. doi:10.1007/978-3-642-27488-6_1.

[2] F. Klessascheck, I. Weber, L. Pufahl, SOPA: A framework for sustainability-oriented process analysis and re-design in business process management, Information Systems and e-Business Management (2025). doi:10.1007/s10257-024-00695-x.

[3] G. H. Brundtland, Our Common Future—Call for Action, Environmental Conservation 14 (1987) 291–294. doi:10.1017/S0376892900016805. arXiv:44518052.

[4] S. Seidel, J. Recker, J. vom Brocke, Sensemaking and Sustainable Practicing: Functional Affordances of Information Systems in Green Transformations, Management Information Systems Quarterly 37 (2013) 1275–1299.

[5] M. Weske, Business Process Management: Concepts, Languages, Architectures, Springer Berlin Heidelberg, Berlin, Heidelberg, 2024. doi:10.1007/978-3-662-69518-0.

[6] M. Dumas, M. La Rosa, J. Mendling, H. A. Reijers, Fundamentals of Business Process Management, Springer, Berlin, Heidelberg, 2018. doi:10.1007/978-3-662-56509-4.

[7] D. Couckuyt, A. Van Looy, A systematic review of Green Business Process Management, Business Process Management Journal 26 (2019) 421–446. doi:10.1108/BPMJ-03-2019-0106.

[8] J. vom Brocke, S. Seidel, J. Recker (Eds.), Green Business Process Management: Towards the Sustainable Enterprise, Springer Berlin Heidelberg, Berlin, Heidelberg, 2012. doi:10.1007/978-3-642-27488-6.

[9] B. Purvis, Y. Mao, D. Robinson, Three pillars of sustainability: In search of conceptual origins, Sustainability Science 14 (2019) 681–695. doi:10.1007/s11625-018-0627-5.

[10] W. Zeug, A. Bezama, D. Thrän, Life Cycle Sustainability Assessment for Sustainable Bioeconomy, Societal-Ecological Transformation and Beyond, in: Progress in Life Cycle Assessment 2021, Springer International Publishing, Cham, 2023, pp. 131–159. doi:10.1007/978-3-031-29294-1_8.

[11] M. Redclift, Sustainable Development, Routledge, 2002. doi:10.4324/9780203408889.

[12] D. C. Hector, C. B. Christensen, J. Petrie, Sustainability and Sustainable Development: Philosophical Distinctions and Practical Implications, Environmental Values 23 (2014) 7–28. doi:10.3197/096327114X13851122268963.

[13] European Union, Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (Text with EEA relevance), 2022.

[14] L. Alessi, S. Battiston, A. S. Melo, A. Roncoroni, The EU sustainability taxonomy: A financial impact assessment (2019). doi:10.2760/347810.

[15] P. Johnston, M. Everard, D. Santillo, K.-H. Robèrt, Reclaiming the definition of sustainability, Environmental science and pollution research international 14 (2007) 60–6. doi:10.1065/espr2007.01.375.

[16] M. Dumas, M. La Rosa, J. Mendling, H. A. Reijers, Process-Aware Information Systems, Springer Berlin Heidelberg, Berlin, Heidelberg, 2018, pp. 341–369. doi:10.1007/978-3-662-56509-4_9.

[17] J. Carmona, B. Van Dongen, A. Solti, M. Weidlich, Conformance Checking: Relating Processes and Models, Springer International Publishing, Cham, 2018. doi:10.1007/978-3-319-99414-7.

[18] F. Klessascheck, S. A. Fahrenkrog-Petersen, J. Mendling, L. Pufahl, Unlocking Sustainability Compliance: Characterizing the EU Taxonomy for Business Process Management, in: Enterprise Design, Operations, and Computing, volume 15409, Springer Nature Switzerland, Cham, 2025, pp. 339–359. doi:10.1007/978-3-031-78338-8_18.

[19] S. Frandsen, M. Morsing, S. Vallentin, Adopting sustainability in the organization: Managing processes of productive loose coupling towards internal legitimacy, Journal of Management Development 32 (2013) 236–246. doi:10.1108/02621711311318265.

[20] J. C. Greene, V. J. Caracelli, W. F. Graham, Toward a Conceptual Framework for Mixed-Method

Evaluation Designs, Educational Evaluation and Policy Analysis 11 (1989) 255–274. doi:10.3102/01623737011003255.
[21] K. Peffers, T. Tuunanen, M. A. Rothenberger, S. Chatterjee, A Design Science Research Methodology for Information Systems Research, Journal of Management Information Systems 24 (2007) 45–77. doi:10.2753/MIS0742-1222240302.
[22] J. Recker, Scientific Research in Information Systems: A Beginner's Guide, Springer, Berlin, Heidelberg, 2013. doi:10.1007/978-3-642-30048-6.
[23] R. K. Yin, Case Study Research: Design and Methods, number 5 in Applied Social Research Methods Series, 4 ed., Sage, Los Angeles, Calif., 2008.
[24] G. Walsham, Interpretive case studies in IS research: Nature and method, European Journal of Information Systems 4 (1995) 74–81. doi:10.1057/ejis.1995.9.
[25] G. Walsham, Doing interpretive research, European Journal of Information Systems 15 (2006) 320–330. doi:10.1057/palgrave.ejis.3000589.
[26] S. Käss, C. Brosig, M. Westner, S. Strahringer, Short and sweet: Multiple mini case studies as a form of rigorous case study research, Information Systems and e-Business Management (2024). doi:10.1007/s10257-024-00674-2.
[27] D. A. Whetten, What Constitutes a Theoretical Contribution?, The Academy of Management Review 14 (1989) 490–495. doi:10.2307/258554. arXiv:258554.
[28] A. Fritsch, J. von Hammerstein, C. Schreiber, S. Betz, A. Oberweis, Pathways to Greener Pastures: Research Opportunities to Integrate Life Cycle Assessment and Sustainable Business Process Management Based on a Systematic Tertiary Literature Review, Sustainability 14 (2022) 11164. doi:10.3390/su141811164.
[29] P. Lübbecke, P. Fettke, P. Loos, Towards Guidelines of Modeling for Ecology-Aware Process Design, in: Business Process Management Workshops, volume 308, Springer International Publishing, Cham, 2018, pp. 510–519. doi:10.1007/978-3-319-74030-0_40.
[30] J. Recker, M. Rosemann, A. Hjalmarsson, M. Lind, Modeling and Analyzing the Carbon Footprint of Business Processes, in: Green Business Process Management, Springer, Berlin, Heidelberg, 2012, pp. 93–109. doi:10.1007/978-3-642-27488-6_6.
[31] M. Medema, B. Popescu, V. Andrikopoulos, D. Karastoyanova, A Life Cycle and Enabling Concepts for Green Business Process Management, 2025 11th International Conference on ICT for Sustainability (ICT4S) (2025).
[32] J. Recker, M. Rosemann, E. R. Gohar, Measuring the Carbon Footprint of Business Processes, in: Business Process Management Workshops, volume 66, Springer, Berlin, Heidelberg, 2011, pp. 511–520. doi:10.1007/978-3-642-20511-8_47.
[33] A. Wesumperuma, A. Ginige, J. A. Ginige, A. Hol, Green activity based management (ABM) for organisations, ACIS 2013 Proceedings (2013).
[34] P. Lübbecke, A. Goswami, P. Fettke, A Method for Ecological Process Optimization Based on Compliance Checking, in: 2018 IEEE 20th Conference on Business Informatics (CBI), IEEE, Vienna, 2018, pp. 119–128. doi:10.1109/CBI.2018.00022.
[35] P. Lübbecke, M. Reiter, P. Fettke, P. Loos, Simulation-Based Decision Support for the Reduction of the Energy Consumption of Complex Business Processes, in: 2015 48th Hawaii International Conference on System Sciences, IEEE, HI, USA, 2015, pp. 866–875. doi:10.1109/HICSS.2015.109.
[36] D. Couckuyt, A. Van Looy, An empirical study on Green BPM adoption: Contextual factors and performance, Journal of Software: Evolution and Process 33 (2021) e2299. doi:10.1002/smr.2299.
[37] T. M. Sohns, B. Aysolmaz, L. Figge, A. Joshi, Green business process management for business sustainability: A case study of manufacturing small and medium-sized enterprises (SMEs) from Germany, Journal of Cleaner Production 401 (2023) 136667. doi:10.1016/j.jclepro.2023.136667.
[38] D. Couckuyt, A. Van Looy, Green BPM as a Business-Oriented Discipline: A Systematic Mapping Study and Research Agenda, Sustainability 11 (2019) 4200. doi:10.3390/su11154200.
[39] R. J. Wieringa, Design Science Methodology for Information Systems and Software Engineering, Springer Berlin Heidelberg, Berlin, Heidelberg, 2014. doi:10.1007/978-3-662-43839-8.
[40] J. Venable, J. Pries-Heje, R. Baskerville, A Comprehensive Framework for Evaluation in Design

Science Research, in: Design Science Research in Information Systems. Advances in Theory and Practice, volume 7286, Springer Berlin Heidelberg, Berlin, Heidelberg, 2012, pp. 423–438. doi:10.1007/978-3-642-29863-9_31.

[41] J. Venable, J. Pries-Heje, R. Baskerville, FEDS: A Framework for Evaluation in Design Science Research, European Journal of Information Systems 25 (2016) 77–89. doi:10.1057/ejis.2014.36.

[42] P. H. Thornton, W. Ocasio, M. Lounsbury, The Institutional Logics Perspective: A New Approach to Culture, Structure and Process, Oxford University Press, 2012. doi:10.1093/acprof:oso/9780199601936.001.0001.

[43] P. H. Thornton, W. Ocasio, M. Lounsbury, The Institutional Logics Perspective, in: Emerging Trends in the Social and Behavioral Sciences, 1 ed., Wiley, 2015, pp. 1–22. doi:10.1002/9781118900772.etrds0187.

[44] S. Seidel, J. Recker, J. V. Brocke, Digital technology affordances for sustainable business practices, in: Research Handbook on Information Systems and the Environment, Edward Elgar Publishing, 2023, pp. 149–164. doi:10.4337/9781802201864.00013.

[45] A. Baiyere, H. Salmela, T. Tapanainen, Digital transformation and the new logics of business process management, European Journal of Information Systems 29 (2020) 238–259. doi:10.1080/0960085X.2020.1718007.

[46] F. Klessascheck, T. Knoche, L. Pufahl, Reviewing Conformance Checking Uses for Run-Time Regulatory Compliance, in: Enterprise, Business-Process and Information Systems Modeling, volume 511, Springer Nature Switzerland, Cham, 2024, pp. 100–113. doi:10.1007/978-3-031-61007-3_9.

[47] J. vom Brocke, W. M. P. van Der Aalst, N. Berente, B. van Dongen, T. Grisold, W. Kremser, J. Mendling, B. T. Pentland, M. Roeglinger, M. Rosemann, B. Weber, Process science: The interdisciplinary study of socio-technical change, Process Science 1 (2024) 1, s44311–024–00001–5. doi:10.1007/s44311-024-00001-5.

[48] W. Klöpffer, B. Grahl, Life Cycle Assessment (LCA): A Guide to Best Practice, Wiley-VCHVerlag GmbH & Co. KGaA, Weinheim, 2014.

[49] F. Klessascheck, L. Bein, L. Pufahl, Simulating Environmental Impacts of Business Processes with SimuBridge and the SOPA Framework, in: Doctoral Consortium and Demo Track 2024 at the International Conference on Process Mining 2024, Copenhagen, Denmark, October 15, 2024, volume 3783 of *CEUR Workshop Proceedings*, CEUR-WS.org, 2024.

[50] L. Bein, F. Klessascheck, S. Nepeina, C. Warmuth, T. Kampik, L. Pufahl, SimuBridge: Discovery and Management of Process Simulation Scenarios, in: Demonstration & Resources Track, Best BPM Dissertation Award, and Doctoral Consortium, Utrecht, 2023.

[51] I. Bogatinovska, F. Klessascheck, K. Andree, L. Pufahl, A Metamodel for Applying Green BPM Approaches with the EU Taxonomy, in: Enterprise, Business-Process and Information Systems Modeling, Vienna, Austria, 2025.

[52] D. Schäfer, F. Klessascheck, T. Kampik, L. Pufahl, Can we leverage process data from ERP systems for business process sustainability analyses?, in: Process Mining Workshops, Springer Nature Switzerland, Cham, 2025, pp. 764–777. doi:10.1007/978-3-031-82225-4_56.

[53] F. Klessascheck, L. Pufahl, Reviewing Uses of Regulatory Compliance Monitoring, 2025. doi:10.48550/ARXIV.2501.10362.

[54] F. Klessascheck, F. Stiehle, Business Value and Worker Wellbeing? Foregrounding Workers in Process Management, in: Proceedings of the 15th International Workshop on Enterprise Modeling and Information Systems Architectures (EMISA 2025), Heilbronn, Germany, May 14-16, 2025, 2025.

[55] A. Wutich, M. Beresford, H. R. Bernard, Sample Sizes for 10 Types of Qualitative Data Analysis: An Integrative Review, Empirical Guidance, and Next Steps, International Journal of Qualitative Methods 23 (2024) 16094069241296206. doi:10.1177/16094069241296206.