Towards Sustainable BPM Excellence: A Maturity Model Grounded in Paradox Theory

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Abstract

Global institution's and customers' demand for sustainable products put pressure on organizations to integrate sustainability into their business strategies. Current organizational priorities on reporting the ratings over improving their business processes towards sustainability have called interest among Business Process Management (BPM) researchers. From the BPM perspective, guidance on gradual improvements is offered in the form of maturity models (MMs). Meanwhile, current models have limitations: corporate sustainability models lack quantification and validation, BPM models do not address specific sustainability capabilities, and green business process models fail to integrate economic and social aspects. Moreover, formulating multiple objectives during business initiatives often creates stakeholder tensions, necessitating the adoption of paradox theory to help organizations manage the issues. Therefore, this PhD research aims to bridge these gaps by developing a maturity model through the lenses of paradox theory and configurational theory to achieve sustainable BPM excellence and a balance of sustainable pillars. The research employs a mixed-method approach, including systematic literature reviews, an expert panel, multiple case studies, a survey, and design science research to ensure robust and validated sustainable BPM MMs. Theoretical contributions will enhance current BPM knowledge within a sustainable context, while practitioners will gain a validated tool for assessing their current state and achieving a desired maturity level of Sustainable Development Goals (SDGs) in a balanced manner. The intermediate findings of the first-year project reveal three categories of balancing efforts toward sustainable BPM: strategic, managerial, and technical approaches.

Keywords

Business Process Management, sustainability, sustainable BPM, paradox theory, tensions management

1. Introduction

International institutions have escalated pressure on organizations to commit to global sustainability initiatives, prompting companies to integrate sustainability objectives into their business strategy. For example, the United Nations Development Program's long-term strategy targets net zero emissions by 2050[1], [2] and the European Commission, which created a Green Deal policy climate-neutral to reduce costs, protect prosperity, and save the planet by 2050 [3]. As customers are increasingly concerned about sustainability [4]; thus, to remain competitive and increase profits, the organization must innovate its business process by also considering social and environmental impacts. This emerging focus has also captured the attention of Business Process Management (BPM) researchers. Consequently, numerous studies have expanded the traditional performance criteria of the "devil's quadrangle"—comprising process quality, cost, time, and flexibility—to include sustainability as a critical process performance metric. Practically, organizations are more focused on reporting the final ratings of sustainability [5], [6], [7]; meanwhile, limited studies provide practical guidelines for how the organization achieves this rating. On the other hand, BPM has the potential to achieve an organization's sustainable performance effectively through business automation, such as the use of process mining that enables data-driven decision support and process enhancements to achieve sustainability in the business process[8]. The integration of BPM with Life Cycle Assessment (LCA), an approach for mapping and evaluating the interlinkages between business processes and environmental impacts, makes another key role of BPM for sustainability ambitions [9]. However, the current study of BPM in correlation with sustainability

mainly emphasizes ecological aspects, lacking the integration with other pillars (i.e., economic and social sustainability), including the BPM evolution to Green BPM[10], [11]. If organizations are eager to transform their business process to achieve sustainability goals, they need to know how they should improve it gradually. From the BPM perspective, organizations need maturity models (MMs) as tools for identifying what capabilities are required, assessing their current capabilities, and designing actionable efforts to achieve the desired levels of sustainability [12]. Meanwhile, the capabilities area represents components of the guidelines related to strategy, governance, methods, IT, people, and culture that organizations must fulfill and lead to successful business process performance. However, the existing MMs framework still focuses on conventional BPM [13], [14], [15], while other frameworks started to address the sustainability perspective but predominantly emphasize environmental aspects, such as in the green BPM maturity model [16]. Therefore, there is a need to extend the conventional and green BPM maturity models and their capability frameworks to encompass the more holistic scope of sustainability pillars. Achieving sustainability objectives in practice involves navigating conflicted demands or tensions from various internal and external stakeholders. These tensions typically pertain to two key issues: (1) the organization's decision to balance sustainability pillars, whether through integration or prioritization of economic, ecological, and social dimensions, or (2) the organization's approach to addressing sustainability paradoxes (i.e., organizing, learning, belonging, and performance tensions). The paradox theory posits that organizations are filled with persistent, contradictory yet interdependent demands[17], while also acknowledging the four tensions categories that underlie opposing goals: belonging, learning, organizing, and performing [18]. Further research [19] specifically discusses conflicted objectives representing paradoxes in BPM, such as 1) between increased complex- ity in analysis and lifecycle agility; 2) process models complexity and cost efficiency; 3) demand for real-time decision and scattered data across different information systems and organizations units; 4) safety-critical or inaccurate properties for finetune process execution (many data analysis are proba- bilistic but untraceable); 5) autonomous actions by IT artifacts and increased resource consumption to steer the process; 6) standardized business process with reduced cost and individualized products. Unfortunately, those studies overlooked detailed guidelines on how to manage the BPM paradoxes and how to incorporate sustainability dimensions in a balanced way. Therefore, the incorporation of sustainability tension management and paradox theory is essential when formulating capability areas and developing metrics for defining sustainable BPM maturity. This PhD research aims to address the gaps mentioned above by developing maturity models under the lens of BPM and paradox theory toward sustainable BPM excellence, including balancing advice. Hence, this study seeks to answer the following questions: How can MM be developed to realize sustainable BPM while balancing three sustainability pillars (economy, ecology, and social)? The theoretical contribution of my research will enrich prescriptive knowledge about sustainable BPM, and while practitioners will benefit from validated tool to assess their current sustainable BPM state and receive actionable recommendations for achieving their Sustainable Development Goals (SDGs) in a balanced manner.

2. Research Design

This doctoral research will be divided into three projects (as seen in Figure 1), each focusing on two things: 1) quantification or measurement of sustainable BPM maturity and 2) balancing approach of sustainability pillars within business process initiatives.

2.1. Project 1 (in progress) – Theorizing Capability Framework and Balancing Acts of Sustainable BPM

This first project's objective is theorizing about the sustainable BPM capability areas, the corresponding approaches for balancing the different sustainability pillars, and the tensions management that emerge as an impact, thereby elucidating the interplay of multidisciplinary knowledge (BPM, Sustainability, and Paradox Theory) to achieve business sustainability goals. A systematic literature review (SLR) [20], will emerge as an appropriate method for addressing the following research questions: RQ 1.1.

Figure 1. Research Roadmap

How can conventional and green BPM capability areas be extended to sustainable BPM? and RQ 1.2. What approaches can organizations follow to balance the sustainability pillars (i.e., economic, ecological, and social) and manage the related tensions in their business process initiatives? In response to RQ 1.2., literature will be searched by using specific keywords of ("Balancing" OR "Balance" OR "Paradox" OR "Trade-Off" OR "tension") AND ("Sustainability" OR "Sustainable") AND "Business Process". The initial pool of 483 articles with a final sample of 47 articles was sourced from various academic databases (ScienceDirect, Web of Science, IEEE, AIS, Scopus). Additionally, another search will be performed to answer RQ 1.1., following specific keywords of ("Capability Area*" OR "Capability") AND (*Sustainability*" OR "Sustainable") AND ("Business Process" OR "Business Process Management" OR "BPM"). This project is expected to result in a capability framework for sustainable BPM. To validate the robustness of this framework, one round of expert panel discussions will be conducted, employing a mixed-method approach that involves both online and offiine interviews with 10 academia and 10 practitioners in BPM and sustainability fields. Another outcome of the first project is to provide an overview of balancing approaches for managing tensions that arise in the pursuit of sustainability goals within business process initiatives. Additionally, the project will suggest future research agendas based on a comprehensive review of current literature.

2.2. Project 2 – Sustainable BPM Theory to Practice

The second project will mainly focus on leveraging the theory from Project 1 into the companies' real practice by identifying sustainable BPM maturity levels and exploring best practices for balancing the different sustainability pillars in business process initiatives. Therefore, case study research will be adopted with consideration of its advantages in investigating the contemporary phenomenon [21], [22], in this case, a sustainable BPM transformation journey in a natural setting over a period of time. Case studies will answer the two research questions: RQ 2.1. What are the important milestones and critical success factors for a successful sustainable BPM implementation? and RQ 2.2. How do organizations choose to balance approaches in their business process initiatives? Multiple case studies will be
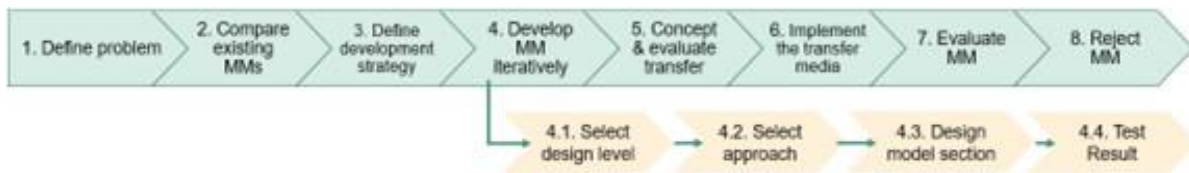
Figure 2. Research Roadmap

performed on four companies with the following criteria: 1) high environmental and social risks (e.g., manufacturing, services, energy, and mining), especially those that have received sustainability awards (e.g. Awards for Belgian Sustainability Report, Australian Reporting Awards. and Asia Sustainability Reporting Awards); 2) have successfully implemented BPM, 3) in order to have comparison and to form generalization, two of those companies will be selected from those who implemented trade-off strategy (achieving success in one sustainability pillar but sacrificing others) and two other companies that integrate all pillars in a more balanced. In order to achieve validity and reliability of MM generalization, the multiple case studies will be strengthened with a survey of 300 various companies in different business sectors and geographical locations. Ultimately, this project will extend conventional BPM maturity levels into sustainable variants, leading to practical insight into best practices for achieving SDGs in business process initiatives in a balanced way. The survey results in this project will also be analyzed further for clustering the organizations based on their archetypes, thereby leveraging a configuration taxonomy and expanding the conventional business process orientation paradigm [22] to encompass sustainability considerations.

2.3. Project 3 – Prescriptive Tool's Development and Testing

This final project will be dedicated to build and test a prescriptive tool for assessing an organization's current state and advising on desired and balanced state of sustainable BPM. A design science research [23] will be performed for developing, applying, and analyzing an artefact, addressing two research questions: RQ 3.1. How can organizations comprehensively measure their current state and achieve a desired state in sustainable BPM? What are the difficulties of assessing the maturity level of sustainability within BPM? and RQ 3.2. How are the balancing approaches of sustainable BPM interconnected to the sustainable BPM maturity levels? The problems (1) are defined in section 1. Research Problems and State of the Art. Then, in the DSR second phase, existing MMs such as corporate sustainability, conventional BPM, green BPM, and digital sustainability will be compared (2) to find their advantages, shortcomings, and limitations to motivate improvements towards sustainable BPM MMs. When determining strategy (3), depending on the second phase result, a strategy between completely designing a new model or combining the existing model into a new one will be chosen. The maturity levels and configuration taxonomy from Project 2 will serve as the foundation for developing MM iteratively (4). This phase involves in-depth case studies on 10 companies across each maturity level to test the comprehensiveness and consistency of the maturity levels and capability areas. Subsequent validity tests will evaluate the configuration taxonomy's effectiveness to suggest pathways to achieve a desired sustainable BPM maturity level, including balancing advice. The validated maturity model is then transferred (5) through academic publications and web-based tool to ensure the visibility of its contributions theoretically and practically. The web-based tool will be evaluated by verification (7) testing to ensure zero error codes and will be validated (7) through workshops involving 10 different companies to test its functionality in assessing the current maturity state, identifying targeted levels, and providing balanced effort recommendations for achieving those targets. Several level definitions or capabilities areas are possible to reject (8) as a result of the evaluation.

2.4. Intermediate Results

As my PhD thesis is currently in its first year, this section will present the intermediate results for the first project. The final sample was analyzed and divided into four categories of efforts to balance the sustainability dimensions (TBL) and rising tensions. First, the Strategic Approach represents how companies incorporate sustainability pillars as additional perspectives in an organization's long-term planning and strategic goals, translated into a sustainable balanced scorecard (SBSC), and then detailing the perspectives into metrics for measuring the achievement. Sustainability Balanced Scorecard (SBSC), extends the traditional balanced scorecard framework which typically only covers finance, internal processes, customer, and learning/growth perspectives. The majority of studies fall under the Managerial Approach, in which suggesting managerial directions for successfully aligning sustainability and current business strategic goals, executing the strategy, monitoring and reporting the goals achievement. Meanwhile, the third category, Technical Approach, employing various technical approaches to deal with sustainability tension within organizational business processes or to optimize sustainability performance defined in SBSC, such as Analytic Hierarchy Process (AHP), artificial intelligence (AI), modelling and simulation, game theory, etc. Several conflicts or tensions within the business process appear in the literature, for example conflicted goals between reducing logistic costs (warehousing and transportation) and maintaining customer satisfaction within the order-to-cash process [24]. To handle these tensions among sustainable objectives and pillars, there are several strategic schemes that are implemented: 1) win-win - prioritizing economic sustainability overs other pillars [25], 2) win-lose - gain benefit in one pillar, but sacrificing other pillars [26], 3) integrative – balancing the pillars from a holistic view by reducing excess weight for economic sustainability or does not prioritizing any of the three dimensions [27], and 4) paradox - urges decision-makers to confront accepted tensions, bringing in the contrast TBL together [28]. Considering new capability areas of managing these tensions under paradox theory are potential to consider in defining the configuration of a sustainable BPM maturity model, the next step of the research will focus on defining and validating those areas.

3. Conclusion and Future Steps

Overall, this PhD project will be completed through three projects, in which each project will merely focus on the measurement of MMs and balancing strategy of sustainability pillars, including the efforts to manage corresponding tensions within the business process initiatives. In this first year of the project timeline, intermediate results have been derived by conducting SLR, revealing that three categories of approaches (i.e., strategic, managerial, and technical) have been performed by the organization to balance the sustainability pillars. Those approaches are complemented with four scheme categories to manage the rising tensions during goal setting, i.e., win-lose, trade-offs, integrative, and paradoxes. However, most literature discusses those approaches and schemes in individual processes, then required to be linked with the context of business process management. In the second year, the project will establish a configuration taxonomy to determine maturity levels. In the third and fourth years, the project will develop and test prescriptive tool to help organizations assess maturity levels and guide their progression towards sustainable BPM, supplemented by comprehensive recommendations to balance sustainability pillars and address tensions under paradox theory.

Acknowledgments

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