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EVOLUTION OF SUSTAINABLE BUSINESS PROCESS MANAGEMENT: PHASES AND THEORETICAL FOUNDATIONS

ЕВОЛЮЦІЯ СТАЛОГО УПРАВЛІННЯ БІЗНЕС-ПРОЦЕСАМИ: ЕТАПИ ТА ТЕОРЕТИЧНІ ЗАСАДИ

This article examines the evolution of sustainable Business Process Management (BPM) from its origins in Green IT to its current data-driven maturity. Three phases are identified: technical foundations (2005–2012), managerial integration (2012–2017), and analytical sophistication (2017–2025). Sustainable BPM has progressed from efficiency-oriented initiatives to integrating environmental, social, and economic sustainability. The study draws on stakeholder, institutional, and resource-based theories, as well as life cycle assessment and information systems affordances. Persistent gaps in empirical validation and tool adoption highlight the need for stronger theory–practice integration and methodological synthesis.

Key words: *sustainable Business Process Management; stakeholder theory; institutional theory; resource-based view; sustainability integration.*

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У статті простежується еволюція концепції сталого управління бізнес-процесами (Sustainable Business Process Management) – від її зародження в межах технічних підходів Green IT до сучасного етапу аналітичної зрілості, орієнтованої на дані, життєвий цикл процесів та інтеграцію принципів сталого розвитку в управлінські рішення. На основі комплексного аналізу наукових і практичних джерел виділено три ключові фази становлення сталого управління бізнес-процесами: технічне підґрунтя (2005–2012), управлінська інтеграція (2012–2017) та аналітична зрілість (2017–2025). Кожна з них відображає поступовий перехід від суто технологічних ініціатив, спрямованих на підвищення ефективності використання ресурсів, до системного, міждисциплінарного підходу, що охоплює екологічні, соціальні та економічні аспекти організаційної діяльності. Теоретичні засади сталого управління бізнес-процесами демонструють значну різноманітність, спираючись як на загальні організаційні теорії, так і на спеціалізовані аналітичні рамки. Зокрема, основу теоретичної еволюції сталого управління бізнес-процесами становлять теорія зацікавлених сторін, інституційна теорія, ресурсно-орієнтований підхід (RBV), оцінювання життєвого циклу (LCA) та теорія афордансів інформаційних систем (IS Affordances Theory). Їхнє поєднання формує основу для розвитку багаторівневих, мультидисциплінарних моделей, здатних пояснити як динаміку впровадження сталих практик, так і їхній вплив на операційну та стратегічну ефективність організацій. Проведений аналіз виявив низку теоретичних і методологічних прогалин, серед яких – фрагментарність концептуальних підходів, недостатнє емпіричне підтвердження інтегрованих моделей, обмежене використання аналітичних інструментів (таких як LCA і process mining) для вимірювання результативності сталих процесів. У підсумку підкреслено необхідність подальших досліджень, спрямованих на узгодження теоретичних засад сталого управління бізнес-процесами, розширення доказової бази та поглиблення зв'язку між цифровими технологіями, управлінням процесами і цілями сталого розвитку.

Ключові слова: *стале управління бізнес-процесами; теорія зацікавлених сторін; інституційна теорія; ресурсна концепція; інтеграція сталого розвитку.*

Problem statement. Sustainable Business Process Management (BPM) entails embedding environmental, social, and economic sustainability dimensions into conventional BPM approaches. This integration has emerged as a response to the growing pressures from regulators, stakeholders, and market forces, organizations are compelled to adopt practices that not only enhance efficiency but also contribute to broader sustainability objectives. Understanding the evolution of sustainable BPM and the theoretical frameworks that underpin its development is therefore essential, both for advancing scholarly knowledge and for informing practical implementation across diverse organizational contexts. Despite considerable advancements, organizations still face difficulties in translating sustainability principles into practice, incorporating lifecycle assessment methodologies, and embedding both analytical and participatory approaches into their operational frameworks.

Analysis of recent research and publications. Recent research has traced the historical trajectory of sustainable BPM, highlighting a transition from technical origins – focused on Green IT and process efficiency – to broader managerial and analytical orientations that emphasize organizational capabilities, stakeholder alignment, and lifecycle-based environmental assessment. Among the key contributors, the following scholars are particularly noted: S. I. D. Pádua and C. J. C. Jabbour [7], N. Opitz et. al. [6], D. Couckuyt and A. Van Looy [2], P. H. Andersen [1] T. Jakobi et. al. [5], G. Hailemariam and J. vom Brocke [4], J. vom Brocke et. al. [10], A. Fritsch et. al. [3], S. Seidel and J. C. Recker [8]. Systematic reviews and conceptual frameworks have

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clarified key developments; however, several gaps persist:

1) the integration of social and economic dimensions alongside environmental concerns remains limited;

2) theoretical approaches are often fragmented, with few multi-level, empirically grounded models;

3) practical implementation of advanced methodologies such as life cycle assessment (LCA), activity-based costing (ABC), and process mining is still challenging;

4) there is insufficient attention to contextual factors, including organizational size, industry characteristics, and regional regulatory environments.

Addressing these unresolved issues is essential for the further development of both theory and practice in sustainable BPM.

The aim of this article is to analyze the evolution of sustainable BPM practices and the theoretical frameworks that explain their development, identifying key gaps and proposing directions for integrated theory–practice advancement.

Presentation of the main material of the study. Sustainable BPM represents the convergence of environmental, social, and economic sustainability concerns with traditional BPM methodologies. As organizations face increasing pressure from stakeholders, regulators, and market forces to adopt sustainable practices, understanding how these practices have evolved and what theoretical frameworks best explain their development becomes critical for both academic research and practical implementation [7].

The evolution of sustainable BPM practices is delineated into developmental phases (Table 1) identified through a comprehensive synthesis of scholarly and industry literature. The timeframes assigned to each phase are indicative rather than absolute, reflecting the gradual and overlapping nature of transitions in both theoretical and practical advancements.

Drawing on the reviewed literature, the evolution of sustainable BPM can be broadly divided into several key phases:

1. Early phase (2005–2012) – marked by the emergence of Green BPM, this stage focused on establishing the technical foundations of sustainability through Green IT initiatives, infrastructure optimization, and the development of early methodological toolkits.

This initial stage of sustainable BPM emerged alongside the Green IT movement and early initiatives aimed at enhancing process efficiency. During this formative period, research and practice were largely driven by technical considerations, focusing on reducing energy consumption, optimizing resource use, and enhancing the operational efficiency of IT infrastructures [6]. The main characteristics of this phase included a distinct technical orientation focused on infrastructure optimization, process-level interventions addressing specific operational inefficiencies rather than systemic organizational transformation, and the development of early methodological toolkits for the implementation of Green BPM [7]. The publication of several seminal guides and conceptual models during this period established Green BPM as an identifiable and independent research domain. These contributions consolidated definitional work, case studies, and practical techniques, positioning Green BPM as a discipline devoted to the design of environmentally sustainable business processes [7; 10].

2. Transition phase (2012–2017) – characterized by a shift from technical efficiency to managerial and strategic integration, emphasizing organizational capabilities, governance structures, and stakeholder

Table 1

Evolutionary phases of sustainable BPM

Period (approx.)	Evolutionary milestone	Core focus	Key characteristics
2005–2012	Emergence of Green BPM	Technical optimization and energy efficiency	– technical orientation centered on Green IT and infrastructure optimization; – process-level improvements over systemic change; – development of early toolkits and methodological foundations for Green BPM
2012–2017	Strategic and managerial integration	Organizational and managerial integration of sustainability	– expansion from technical efficiency to strategic and governance concerns; – emphasis on organizational capabilities and readiness; – stakeholder integration and alignment of sustainability objectives; – systematic reviews mapping the field and identifying theoretical gaps
2017–2025 (ongoing)	Data-driven and lifecycle focus	Methodological sophistication, analytics, and collaboration	– integration of LCA into BPM lifecycles; – use of Sustainability-Oriented Process Analysis (SOPA) and activity-based costing (ABC); – process mining, analytics, and predictive modeling for sustainability; – participatory and cross-functional approaches for collaborative Green BPM

Source: compiled by the authors based on [1–8; 10]

alignment in pursuing sustainable process management.

The subsequent period was marked by a significant conceptual and practical shift from purely technical problem-solving toward a broader managerial and organizational orientation. This evolution closely paralleled the historical trajectory of traditional BPM, which had similarly expanded from a technical focus to encompass strategic and managerial dimensions [6]. The field's scope broadened considerably, extending beyond the reduction of energy consumption to include governance mechanisms, stakeholder alignment, and the strategic integration of sustainability objectives within corporate management structures. Researchers increasingly recognized that effective Green BPM adoption depended on specific organizational capabilities and readiness factors [2]. Furthermore, this period witnessed a growing awareness of the importance of multi-stakeholder engagement, emphasizing the need to reconcile diverse interests and expectations in sustainable process design [4]. Conceptually, the field matured through the publication of comprehensive systematic reviews that mapped the Green BPM research landscape, identified persistent gaps, and proposed structured research agendas. These reviews captured the ongoing evolution from technical to managerial perspectives and underscored the necessity for stronger theoretical foundations [2; 6].

3. Maturation phase (2017–2025, ongoing) – defined by a data-driven and lifecycle-oriented focus, this phase integrates analytical methods, life cycle assessment, and cross-functional collaboration to embed sustainability across the entire BPM lifecycle.

The most recent stage in the evolution of sustainable BPM has been characterized by increasing methodological sophistication, advanced measurement techniques, and the integration of analytical tools designed to evaluate environmental impacts with greater precision.

A major advancement in this phase is the systematic incorporation of LCA methodologies into BPM lifecycles. Recent tertiary reviews and conceptual frameworks have argued for embedding LCA into process analysis and redesign to account for the full environmental implications of activities across both product and process lifecycles [3]. Among the key innovations is the Sustainability-Oriented Process Analysis (SOPA) framework, which extends the BPM lifecycle by integrating LCA and activity-based costing (ABC) principles. This framework has been validated through design science case studies that demonstrate its applicability and robustness in sustainability-oriented process management [1]. The field has also moved toward the adoption of audit-grade sustainability metrics directly embedded in process models, enabling rigorous and traceable measurement. Importantly, scholars increasingly emphasize the necessity of holistic impact assessment, advocating for the inclusion of entire value chains and product lifecycles rather than limiting analysis to organizational boundaries [3].

The frontier of sustainable BPM research and practice now lies in the application of process mining and advanced analytics for sustainability assessment. Emerging studies propose sustainability analysis patterns that enable existing process mining tools to be extended and refined for sustainability-oriented purposes [5]. These approaches foster data-driven insights by leveraging event logs and real-time process data to detect potential areas for sustainability enhancement. The development of reusable, pattern-based methods has enhanced the consistency and scalability of sustainability assessments, while predictive analytics techniques are increasingly employed to forecast the potential environmental and social impacts of process redesigns.

The growing recognition that sustainability outcomes depend on cross-functional collaboration has stimulated the creation of frameworks that promote participatory practices within Green BPM. These approaches promote the integration of strategic objectives with day-to-day operations through collaborative workshops, stakeholder engagement mechanisms, and co-creation practices [5; 8]. Such participatory methodologies help bridge the gap between strategic sustainability ambitions and practical process execution, ensuring that sustainability principles are embedded across all organizational levels.

Overall, the evolution of sustainable BPM can be described as a progression through three interrelated yet distinct phases. The technical phase focused primarily on Green IT, energy efficiency, and process-level optimization; the managerial phase expanded the perspective to encompass organizational capabilities, stakeholder integration, and strategic alignment; and the analytical phase introduced lifecycle integration, data-driven analytics, rigorous measurement, and collaborative practices. This cumulative trajectory demonstrates a clear pattern of increasing complexity, methodological refinement, and deeper embedding of sustainability principles within BPM frameworks. It reflects the transformation of sustainable BPM from a technically motivated efficiency initiative into a mature, interdisciplinary research field that integrates environmental, managerial, and analytical dimensions.

The theoretical foundations of sustainable BPM are characterized by considerable diversity, drawing upon general organizational theories as well as specialized analytical frameworks. While this pluralism has enriched the field, it has also revealed the dominance of a relatively limited set of recurring theoretical perspectives. Consequently, recent scholarship has emphasized the need for more comprehensive theory

building and greater integration across conceptual domains [1]. The theoretical evolution of sustainable BPM thus reflects a gradual movement from isolated applications of single frameworks toward more holistic, multi-theoretical models capable of explaining both adoption dynamics and operational outcomes. These frameworks include:

1) stakeholder theory [4; 10];
2) institutional theory [10];
3) resource-based view (RBV) [2; 10];
4) life cycle assessment (LCA) [1; 3];
5) information systems (IS) affordances theory [8; 9].

Stakeholder theory emphasizes that the legitimacy and sustainable development of an organization depend on its capacity to respond to the expectations of multiple stakeholder groups, including shareholders, employees, consumers, local communities, and regulatory actors. In the context of sustainable BPM, this theory underscores the necessity of expanding performance criteria beyond traditional measures of efficiency and effectiveness to encompass sustainability outcomes valued by different stakeholder groups [4]. By providing an explanatory lens for reconciling multiple and sometimes conflicting stakeholder demands, it illuminates how process design can reflect broader societal and environmental expectations. Over time, stakeholder theory has proven particularly influential in explaining the conceptual broadening of BPM from a narrow technical endeavor to a strategic initiative that integrates sustainability as a core organizational objective. The theory further elucidates why organizations adopt Green BPM practices even when immediate financial returns are ambiguous, as legitimacy concerns and stakeholder pressures often serve as powerful motivating forces [4; 10].

Institutional theory asserts that organizational practices are shaped by external institutional forces – namely regulatory mandates (coercive isomorphism), professional standards and norms (normative isomorphism), and imitation of peer practices (mimetic isomorphism). Applied to sustainable BPM, this theory accounts for the widespread adoption of Green BPM approaches driven by compliance obligations, accepted industry standards, and the desire to emulate successful competitors [10]. It helps explain the diffusion of sustainability practices across sectors exposed to similar institutional conditions, even when immediate operational advantages are not evident. This perspective supports the analysis of sector-specific variations, the role of professional associations in promoting sustainability, and the occurrence of symbolic actions where organizations publicly signal environmental responsibility without substantial internal transformation.

The resource-based view (RBV) conceptualizes competitive success as resulting from the possession and effective use of distinctive resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN). Within the sustainable BPM domain, RBV serves to explain variation in the effectiveness of Green BPM implementation, attributing differences to the presence of unique organizational capabilities [2; 10]. The concept of Green BPM readiness derives directly from RBV logic, emphasizing the necessity of developing and mobilizing capabilities such as sustainability expertise, process management maturity, supportive technological infrastructure, a culture conducive to environmental responsibility, and strong top management commitment [2]. Organizations possessing such competencies are better positioned to sustain Green BPM initiatives and translate sustainability efforts into enduring competitive advantage.

Life Cycle Assessment (LCA) represents a methodological approach designed to measure environmental impacts comprehensively across the entire lifecycle of a product or process – from raw material extraction through production, use, and disposal. In sustainable BPM research, LCA has evolved from an external environmental accounting instrument to a deeply integrated analytical framework embedded within BPM lifecycles [1; 3]. This integration allows for the systematic evaluation of sustainability performance and the informed reengineering of business processes based on measurable environmental criteria. Methodological advancements include linking process-level activities to specific environmental impacts, combining LCA with activity-based costing (ABC) for economic–environmental trade-off analysis, and adopting lifecycle thinking that extends beyond organizational boundaries to encompass entire value chains [1; 3]. The incorporation of LCA into BPM frameworks thus represents a significant theoretical and methodological milestone, enabling more rigorous, evidence-based sustainability assessment.

Information Systems (IS) affordances theory posits that the material and functional properties of digital technologies enable certain actions while constraining others, thereby shaping user behavior and organizational processes. In sustainable BPM, this theory elucidates how information systems can facilitate both incremental and transformative changes toward sustainability [8; 9]. Digital affordances – such as visibility, traceability, simulation, and collaboration – create opportunities for sustainability interventions that would be otherwise infeasible. Specific functional affordances identified in the literature include transparency (making environmental impacts visible), simulation (enabling ex-ante modeling of sustainability consequences), collaboration (supporting cross-functional initiatives), and monitoring (enabling continuous measurement of sustainability metrics) [8].

Collectively, these affordances demonstrate the critical role of digital technologies as enablers of sustainable process innovation.

A comparative perspective reveals that each theoretical lens contributes distinct explanatory insights into sustainable BPM development (Table 2). Stakeholder theory primarily elucidates why organizations pursue sustainability-oriented BPM, emphasizing legitimacy and multi-stakeholder expectations. Institutional theory complements this view by explaining adoption patterns across industries, focusing on the influence of coercive, normative, and mimetic pressures. The resource-based view contributes by identifying the firm-level capabilities that underpin successful implementation, though its static orientation limits understanding of dynamic evolution. LCA provides a rigorous foundation for environmental measurement, yet its complexity and data intensity constrain applicability. Finally, IS affordances theory highlights how technology mediates sustainability enactment, offering operational insight into how sustainability practices are embedded within processes. The integrative potential across these frameworks is high, particularly where governance-oriented theories (stakeholder and institutional) intersect with capability-based and technology-enabled perspectives (RBV, LCA, IS affordances).

Early studies in sustainable BPM typically relied on single theoretical perspectives, which provided focused but partial explanations. Over time, the field has moved toward multi-theoretical integration to capture the complex, multi-level nature of sustainability transformations. Notable examples include the combination of stakeholder and institutional theories to jointly explain stakeholder pressures and institutional forces shaping adoption [10]; the integration of RBV and LCA to link organizational capabilities with environmental performance measurement [1; 2]; and the synthesis of IS affordances with LCA to demonstrate how digital technologies enable lifecycle-based process analysis [3; 9]. These combinations reflect the maturation of sustainable BPM as a theoretically pluralistic field capable of addressing interrelated governance, capability, and technological dimensions.

The most advanced contributions in recent years have introduced multi-layered integrative frameworks that consolidate diverse theoretical perspectives into a coherent explanatory structure. Such frameworks typically comprise four interdependent layers:

1) a governance layer drawing on stakeholder and institutional theories to explain the motivations behind Green BPM adoption;

2) a capability layer informed by RBV to specify the organizational enablers of success;

3) a measurement layer based on LCA for the rigorous assessment of sustainability performance;

4) an enactment layer utilizing IS affordances theory to elucidate how technology operationalizes sustainability within business processes [3].

Table 2

Comparative overview of theoretical frameworks explaining sustainable BPM development

Theoretical framework	Core focus	Application to sustainable BPM	Main contributions	Limitations
Stakeholder theory	Organizational legitimacy; multi-stakeholder interests	Explains why firms adopt Green BPM to meet diverse stakeholder expectations and enhance legitimacy	Broadens BPM goals to include environmental and social outcomes; clarifies non-financial motivations	Limited in explaining capability building and operational mechanisms
Institutional theory	Coercive, normative, and mimetic pressures	Explains diffusion of sustainability-oriented BPM across institutional contexts	Clarifies how regulatory, professional, and peer pressures drive adoption	May explain symbolic rather than substantive adoption; lacks focus on internal processes
Resource-based view (RBV)	Firm-specific resources and capabilities (VRIN logic)	Explains heterogeneity in BPM sustainability outcomes based on unique organizational capabilities	Introduces Green BPM readiness; links sustainability to competitive advantage	Static orientation; limited attention to external institutional factors
Life cycle assessment (LCA)	Measurement of environmental impact across process lifecycles	Provides analytical basis for assessing process-level sustainability	Enables quantifiable assessment; supports redesign of processes based on lifecycle impacts	Data-intensive; limited incorporation of social and economic dimensions
Information systems (IS) affordances theory	Digital enablement; functional and material properties of IS	Explains how digital tools enable sustainability-oriented process innovations	Identifies affordances (visibility, traceability, collaboration, monitoring) enabling sustainability interventions	Technological determinism risk; limited focus on organizational context

Source: developed by the authors based on [1–4; 8–10]

Together, these layers provide a comprehensive model that links organizational intent, capability development, measurement precision, and technological implementation.

Despite notable progress toward integrative models, sustainable BPM research remains fragmented, lacking cohesive theoretical frameworks that connect governance mechanisms, organizational capabilities, environmental accounting methods, and digital enablement. Reviews highlight the need for unified theories bridging these conceptual silos [6].

Another limitation is the insufficient empirical grounding of theoretical propositions: much of the literature is conceptual or review-based, with few large-scale or longitudinal studies testing integrated frameworks. Future research should develop robust empirical designs, including cross-sector and longitudinal analyses of Green BPM evolution [3].

Existing theories often prioritize the ecological dimension of sustainability while overlooking its social and economic dimensions. Despite the frequent reference to the triple bottom line (TBL), its practical application in BPM research remains underdeveloped, requiring a more balanced theoretical approach [3].

The field would also gain from adopting dynamic perspectives that elucidate the temporal development of Green BPM capabilities. Theories of dynamic capabilities, organizational learning, and co-evolution between technology, practices, and sustainability outcomes are especially relevant [1].

The theoretical frameworks discussed earlier in the paper collectively illuminate the evolution of sustainable BPM practices. Each framework contributes a distinct explanatory lens, clarifying the underlying mechanisms driving the field's transition from a primarily technical concern toward a multidimensional managerial and strategic discipline.

The shift from a technical to a managerial orientation in sustainable BPM can be explained through institutional and stakeholder perspectives. From an institutional view, rising regulatory pressures have compelled organizations to integrate sustainability into strategic agendas rather than treat it as an operational add-on. Stakeholder theory further highlights growing expectations for firms to deliver not only efficiency but also measurable sustainability and social accountability. The increasing professionalization of sustainability management adds normative pressures that reinforce organization-wide sustainability practices [4; 6; 10]. Thus, BPM evolution has been shaped by institutional coercion, stakeholder legitimacy concerns, and professional norms rather than technology alone.

The rise of organizational readiness models and capability frameworks in Green BPM can be interpreted through the RBV. This perspective suggests that successful sustainability-oriented BPM relies on firm-specific capabilities that are valuable, rare, inimitable, and non-substitutable. Environmental improvement requires not only compliance but also competencies in process innovation, data-driven assessment, and change management. Capability heterogeneity explains variation in Green BPM adoption and outcomes. As sustainability becomes a competitive differentiator, firms must develop capabilities that turn it into a strategic advantage [2].

The growing methodological sophistication of sustainable BPM – through the integration of LCA, activity-based costing, and process mining – can be explained by combining LCA and IS affordances theory. Stakeholder demands for credible sustainability metrics have spurred the adoption of analytical tools enabling evidence-based assessment. Simultaneously, technological affordances such as simulation, traceability, and monitoring make the use of these methods feasible within business processes. The maturation of LCA methodologies has made such integration both possible and necessary, supporting the quantification of sustainability performance across process lifecycles [1; 3; 8].

Despite these theoretical advances, a persistent divide remains between conceptual sophistication and practical implementation. This theory–practice gap manifests primarily in two domains: implementation complexity and contextual specificity.

Theoretical frameworks often understate the intricate challenges organizations face in operationalizing integrated sustainability approaches. In practice, firms encounter considerable obstacles related to the availability and quality of data required for LCA, as well as the technical challenges of embedding sustainability metrics into legacy information systems. Cultural resistance within organizations further impedes progress, as sustainability initiatives may conflict with established performance priorities. Additionally, organizations frequently struggle to reconcile trade-offs between sustainability objectives and traditional efficiency-driven performance metrics, leading to partial or symbolic implementation [1; 3].

Another critical limitation of existing theories lies in their tendency toward generalization. Sustainable BPM implementation, however, is deeply context-dependent. Industry structure, organizational size, and regional or cultural factors significantly shape both the feasibility and form of sustainability integration. Future research must therefore move beyond universal models to examine industry-specific adoption trajectories, the contrasting dynamics between small and large enterprises, and the influence of geographic and institutional environments on sustainability practices [2].

Conclusions. The evolution of sustainable BPM reveals a clear progression from technically oriented efficiency improvements toward strategically integrated and data-driven approaches. This transformation reflects the maturation of BPM into

an interdisciplinary field combining environmental, managerial, and technological perspectives.

Theoretical analysis indicates that sustainable BPM draws upon a limited but influential set of frameworks. While this pluralism enriches conceptual understanding, it remains fragmented, underscoring the need for integrative models linking governance, capabilities, environmental measurement, and digital enablement.

Future research should focus on three key directions:

1. Bridging theory and practice through design science approaches that test and refine sustainability-oriented BPM tools in real contexts.

2. Advancing methodological integration by combining LCA, process mining, and ABC to embed quantifiable sustainability metrics within BPM models.

3. Developing multi-level theoretical frameworks that connect institutional, organizational, process, and individual perspectives to explain how sustainability is enacted and maintained across systems.

Overall, the consolidation of sustainable BPM as a mature research domain depends on uniting theoretical diversity with empirical rigor and methodological coherence, ensuring that sustainability becomes an intrinsic and measurable dimension of process management.

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