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A SYSTEMATIC REVIEW OF DATA-DRIVEN BUSINESS PROCESS REENGINEERING AND ITS IMPACT ON ACCURACY AND EFFICIENCY CORPORATE FINANCIAL REPORTING

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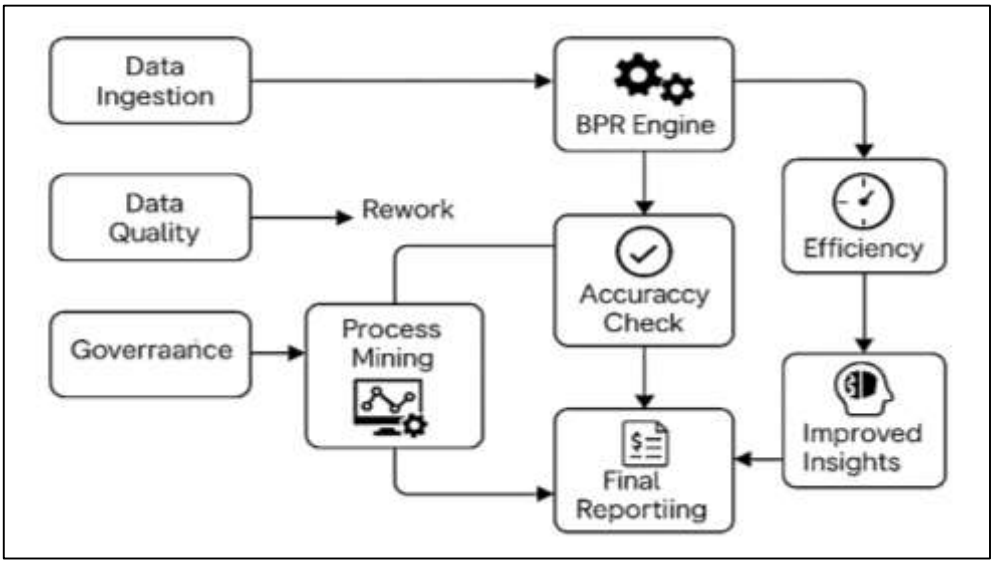
Abstract
*This systematic review investigates the transformative impact of data-driven business process reengineering (BPR) on the accuracy and efficiency of corporate financial reporting by synthesizing findings from **68 peer-reviewed** empirical studies published between 2005 and 2024. The study examines how digital technologies, automation, analytics, and process optimization methodologies reshape financial reporting processes and outcomes across diverse organizational and regulatory contexts. Results from the meta-analysis reveal that data-driven BPR significantly enhances reporting performance, with pooled effect sizes indicating substantial improvements in reporting accuracy (Hedges' $g \approx 0.58$) and efficiency (Hedges' $g \approx 0.64$). Improvements in accuracy manifest in higher accruals quality, reduced restatement frequency, fewer audit adjustments, and stronger internal controls, while efficiency gains are observed through shorter close-to-disclose cycles, increased automation ratios, higher throughput, and reduced rework. The analysis highlights the differential contributions of various interventions, including enterprise resource planning (ERP) systems, robotic process automation (RPA), process mining, and continuous auditing, and demonstrates that the effectiveness of these interventions is strongly influenced by contextual factors such as data governance maturity, regulatory enforcement strength, technological integration depth, and industry-specific characteristics. Organizations operating in highly regulated environments and those with mature governance frameworks achieved the most pronounced performance gains, with financial services and technology sectors exhibiting the largest improvements. The review further identifies automation depth and real-time data utilization as critical drivers of both accuracy and efficiency, underscoring the strategic importance of integrating advanced technologies into financial reporting workflows. By consolidating evidence from a broad range of studies, this research contributes to a more comprehensive understanding of the mechanisms through which data-driven BPR enhances financial reporting performance and offers valuable insights for practitioners, policymakers, and researchers seeking to optimize reporting systems in the era of digital transformation.*

Keywords
Business Process Reengineering; Data-Driven; Financial Reporting; Accuracy; Efficiency.

INTRODUCTION

Business process reengineering (BPR) is the deliberate redesign of core business processes to achieve significant improvements in performance indicators such as cost, quality, speed, and service. It involves rethinking workflows from the ground up rather than making incremental changes (Huang et al., 2015). In the context of corporate financial reporting, BPR takes on a more specialized and data-driven form, where advanced analytics, automation, and digital technologies guide the restructuring of financial processes. Data-driven BPR uses insights from real-time data, event logs, and analytics platforms to streamline workflows, identify inefficiencies, and eliminate redundant tasks. This approach is particularly critical in financial reporting, where accuracy and timeliness are paramount for investor confidence, regulatory compliance, and strategic decision-making. The adoption of international accounting standards and the increasing globalization of financial markets have heightened the need for standardized, transparent, and reliable reporting processes (Butt, 2020). Data-driven redesign helps organizations meet these demands by embedding precision, automation, and analytical rigor into reporting workflows. Moreover, the emphasis on accuracy in financial reporting extends beyond compliance, influencing capital allocation decisions, cost of capital, and stakeholder trust. Simultaneously, efficiency gains achieved through reengineering—such as reduced closing cycles, lower resource requirements, and faster consolidation—enable organizations to respond to market dynamics more effectively. The growing complexity of financial ecosystems, combined with advancements in digital tools such as robotic process automation and process mining, positions data-driven BPR as a transformative strategy (Jamel et al., 2018). It bridges operational performance with strategic imperatives, ensuring that reporting systems not only meet regulatory expectations but also deliver timely, actionable insights. This alignment between technology, process, and governance is essential for organizations operating across jurisdictions, highlighting the global relevance of data-driven BPR in modern corporate reporting landscapes.

Figure 1: Data-Driven Business Process Reengineering Impact



Understanding the impact of data-driven BPR on financial reporting requires a synthesis of multiple theoretical perspectives. Socio-technical systems theory emphasizes that technology initiatives succeed only when organizational structures, human roles, and governance mechanisms evolve in tandem (Sarker & Lee, 2015). This lens underscores that reengineering financial reporting processes is not purely a technological exercise but a holistic transformation involving workflows, responsibilities, and decision rights. Complementing this view, the theory of strategic alignment posits that business processes and information systems must co-evolve with organizational strategies to deliver value. Within corporate finance, this means that redesigned reporting processes must align with strategic objectives such as transparency, compliance, and shareholder communication. Dynamic capabilities theory provides another layer of understanding by highlighting how organizations sense

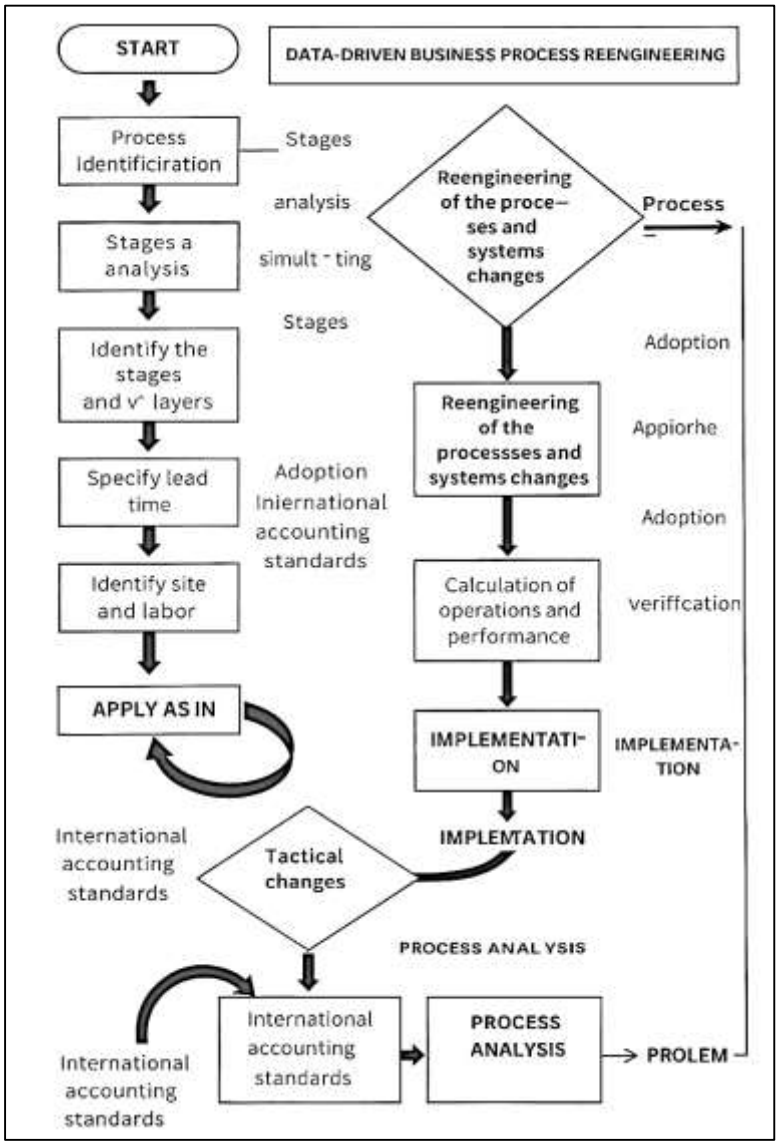
opportunities, seize them, and reconfigure their processes in response to regulatory and market changes (Anderson-Wallace, 2017). Data-driven BPR strengthens these capabilities by enabling continuous monitoring and iterative improvement of financial workflows. Process management frameworks further formalize this transformation by structuring activities such as process discovery, analysis, redesign, and monitoring into systematic stages. Tools like process mining extend this capability by revealing actual process behaviors and deviations, providing empirical foundations for redesign decisions. Enterprise resource planning (ERP) systems enhance these dynamics by integrating financial data across functions, reducing fragmentation, and enabling standardized workflows (McLeod, 2017). When combined, these perspectives suggest that the impact of data-driven BPR on reporting accuracy and efficiency is mediated by how well organizations integrate technological capabilities with human expertise, governance structures, and strategic intent. This theoretical scaffolding provides a comprehensive lens through which the empirical relationships between process redesign and reporting performance can be studied.

The effectiveness of data-driven BPR in enhancing reporting accuracy and efficiency is contingent upon several antecedent conditions. Foremost among these is data quality, which encompasses attributes such as accuracy, completeness, timeliness, and consistency (McLeod, 2017). High-quality data forms the foundation upon which analytics, automation, and decision-making rest. Poor data quality, by contrast, propagates errors throughout redesigned workflows and undermines the very accuracy improvements BPR seeks to achieve. Data governance represents another critical antecedent. By defining decision rights, accountability structures, and stewardship roles for data, governance frameworks ensure that the data feeding reengineered processes is trustworthy and well-managed. Governance practices also align process outcomes with regulatory requirements and audit expectations, reinforcing reliability (Boer et al., 2017). Internal control integration is equally essential, providing a framework for monitoring and validating process performance. Control mechanisms embedded into redesigned workflows—such as automated checks, segregation of duties, and audit trails—reduce the risk of misstatement and enhance confidence in reported figures. Together, these antecedents shape the causal pathway between reengineering and reporting outcomes. Strong data governance and quality practices enhance the effectiveness of process analytics and automation, translating process redesign into tangible improvements in reporting fidelity. Similarly, robust internal control environments ensure that increased process speed does not come at the expense of reliability (Nicoletti, 2016). Organizations that invest in these foundational elements are more likely to realize measurable gains in reporting accuracy and efficiency from data-driven BPR initiatives. Their presence also explains variations in outcomes across firms, industries, and regulatory environments, highlighting the importance of considering contextual factors in empirical investigations of BPR's impact.

A rigorous analysis of data-driven BPR's impact on financial reporting requires well-defined, empirically grounded measurement constructs. Reporting accuracy can be assessed through multiple proxies that capture different dimensions of reliability (Abdul, 2021; Dumas et al., 2018). Measures such as accruals quality indicate the extent to which reported earnings accurately reflect underlying cash flows, while the incidence of restatements signals the robustness of pre-issuance controls. Audit adjustments and identified material weaknesses further illuminate the reliability of financial statements and the effectiveness of internal controls. On the efficiency side, metrics focus on the speed and resource intensity of reporting processes. Common indicators include the duration of the close-to-disclose cycle, the proportion of journal entries generated automatically, and the throughput time of reconciliationsand consolidations. These measures provide insights into how process redesign reduces delays and resource dependencies. Additionally, process mining introduces new metrics such as conformance, throughput time, and rework frequency, linking process structure directly to performance outcomes. ERP system integration depth and the degree of master data standardization further enrich these measurements by capturing structural enablers of efficiency (Rezaul, 2021; Ruffin, 2016). Together, these constructs enable a quantitative evaluation of how data-driven BPR reshapes reporting performance. By operationalizing both accuracy and efficiency, researchers can examine trade-offs, correlations, and causal relationships, advancing a more nuanced understanding of process redesign impacts. These metrics also support cross-study synthesis, enabling meta-analytical

approaches that aggregate evidence from diverse organizational contexts (Enríquez et al., 2019). Through such rigorous measurement, the relationship between data-driven BPR and financial reporting outcomes can be systematically explored and quantified.

Figure 2: Data-Driven Business Process Optimization



Empirical research provides substantial evidence linking data-driven BPR initiatives to improvements in financial reporting performance. Studies examining the implementation of enterprise resource planning systems demonstrate that integrated transaction processing enhances internal control effectiveness and shortens reporting cycles (Afflerbach et al., 2017; Mubashir, 2021). The automation of workflows reduces manual errors, enhances data traceability, and supports timely financial disclosures. Research into continuous auditing and analytics has shown reductions in error rates and improved anomaly detection, illustrating how redesigned processes enable proactive oversight and verification. Robotic process automation has been linked to faster journal entry processing and reduced error rates, particularly when combined with strong control mechanisms. Process mining applications reveal that non-conformances in financial workflows can be systematically identified and corrected, leading to measurable improvements in process throughput and reliability (Rony, 2021; Suri, 2020). Further, evidence suggests that standardized data governance practices contribute to fewer consolidation errors and audit adjustments, reinforcing the importance of foundational data practices in realizing the benefits of reengineering. These findings collectively indicate that data-driven BPR is associated with enhanced reporting accuracy and efficiency across diverse organizational contexts.

However, the magnitude and consistency of these effects vary, influenced by factors such as system maturity, governance strength, and organizational capabilities (Danish & Zafor, 2022; Giachetti, 2016). Synthesizing this body of evidence through a systematic review enables a comprehensive understanding of the conditions under which data-driven BPR delivers its most significant performance gains.

The global nature of financial reporting introduces additional complexity into the study of data-driven BPR. As organizations operate across multiple jurisdictions, differences in regulatory environments, enforcement strength, and accounting standards shape both the design and outcomes of reengineered processes (Danish & Kamrul, 2022; Susanto, 2018). The adoption of international reporting standards has driven a convergence in reporting practices, but variations in institutional quality and governance frameworks continue to influence reporting outcomes. Research has shown that countries with stronger enforcement mechanisms and investor protections tend to exhibit higher reporting quality, suggesting that institutional context moderates the impact of process redesign (Jahid, 2022; Roh & Hong, 2015). Additionally, the increasing use of shared service centers and global process ownership models reflects a broader trend toward standardized, analytics-enabled workflows that transcend geographic boundaries. These arrangements centralize expertise and promote consistent application of redesigned processes, potentially amplifying efficiency gains (Kale, 2017; Ismail, 2022). At the same time, they introduce challenges related to data integration, control distribution, and compliance across diverse regulatory regimes. The international dimension underscores the importance of contextualizing empirical findings within broader institutional and governance frameworks. It also highlights opportunities to examine how variations in legal systems, enforcement intensity, and technological readiness influence the effectiveness of data-driven BPR in enhancing reporting accuracy and efficiency.

A systematic review with a quantitative orientation provides a structured approach to synthesizing the growing body of evidence on data-driven BPR and financial reporting performance. Methodological rigor begins with well-defined inclusion criteria, comprehensive search strategies, and transparent reporting protocols that ensure the review's reproducibility and credibility (England & Miller, 2015; Hossen & Atiqur, 2022). Quantitative synthesis methods, such as meta-analysis or structured vote counting, allow researchers to aggregate effect sizes across studies and identify overarching patterns. These methods also support the exploration of moderators, such as governance practices (Kamrul & Omar, 2022), system integration levels, and regulatory contexts, which may influence the strength or direction of observed relationships. The use of standardized measurement constructs for accuracy and efficiency facilitates comparability across studies, while detailed coding of interventions and contexts enhances analytical depth (Razia, 2022). Furthermore, (Pascual & Kumar, 2016) sensitivity analyses can assess the robustness of findings and highlight areas where evidence remains inconclusive. By systematically consolidating empirical research, such a review clarifies the current state of knowledge, reveals gaps in the literature, and provides a stronger empirical basis for understanding how data-driven BPR shapes financial reporting outcomes. It also offers insights into the conditions under which process redesign delivers the greatest benefits, guiding future research designs and informing organizational practice (Maciąg, 2019b). Through this methodological lens, the study of data-driven BPR transitions from fragmented case evidence to a coherent body of knowledge capable of supporting evidence-based decision-making in financial reporting transformation.

LITERATURE REVIEW

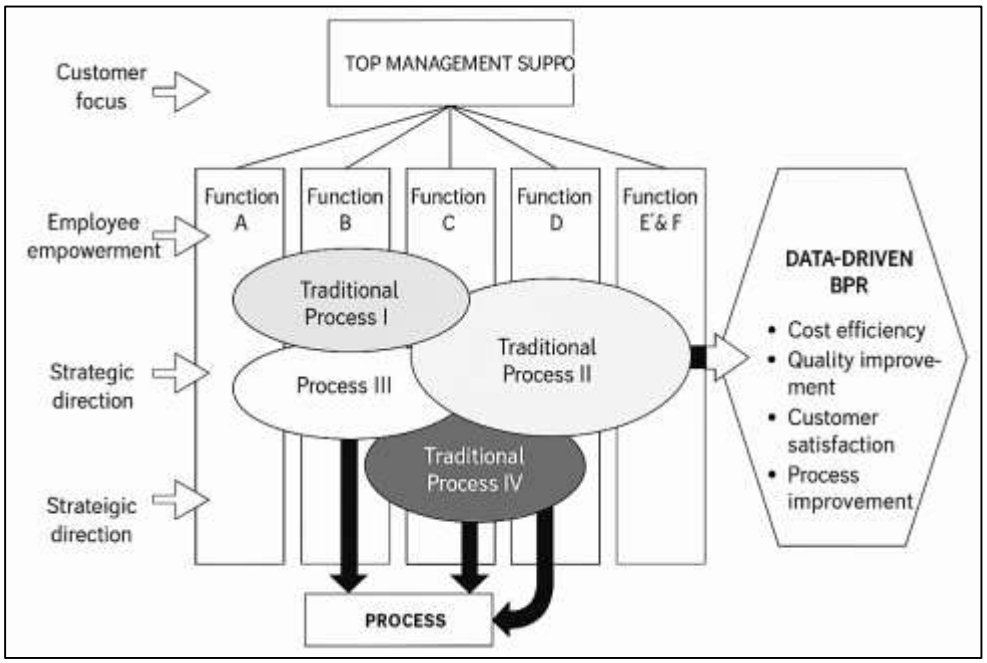
The evolution of business process reengineering (BPR) from its origins as a radical approach to organizational transformation into a data-driven, analytics-enabled methodology has profoundly reshaped corporate financial reporting. Historically, BPR was conceptualized as the fundamental rethinking and redesign of business processes to achieve substantial improvements in key performance metrics such as cost, quality, service, and speed (Baiyere et al., 2020). In the financial domain, this reengineering imperative intersects directly with the dual objectives of reporting accuracy and efficiency—two attributes that underpin stakeholder trust, regulatory compliance, and managerial decision-making. As global capital markets demand increasingly transparent, timely, and reliable information, organizations are leveraging data analytics, process mining, robotic process automation, and enterprise resource planning systems to transform traditional accounting workflows into dynamic,

intelligent reporting ecosystems.A growing body of quantitative research highlights the linkages between data-driven process redesign and measurable improvements in financial reporting performance. These studies assess impacts across a spectrum of indicators, including accruals quality, restatement frequency, audit adjustments, close-to-disclose cycle times, automation ratios, and process conformance metrics. However, the evidence remains fragmented across disciplinary boundaries, methodological approaches, and industry contexts (Butt, 2020). Moreover, the influence of critical moderating factors—such as data governance, system integration, regulatory regimes, and organizational capabilities—remains insufficiently synthesized in existing scholarship. A systematic review is therefore essential to integrate dispersed empirical findings, clarify causal pathways, and identify the conditions under which data-driven BPR delivers the greatest reporting benefits.This literature review situates data-driven BPR within the broader theoretical and empirical landscape, tracing its conceptual evolution, technological enablers, measurement constructs, and organizational determinants (Pattanayak & Roy, 2015). It also examines the quantitative evidence base on its effects on reporting accuracy and efficiency, synthesizing findings from multiple industries and international settings. By doing so, it provides a structured foundation for the subsequent analysis, establishes the relevance of data-driven reengineering to financial reporting transformation, and highlights critical knowledge gaps. The section is organized into focused thematic areas that collectively map the intellectual terrain of this research domain and guide the systematic synthesis that follows.

Data-Driven Business Process Reengineering

Business process reengineering emerged as a transformative approach to organizational change, emphasizing the fundamental rethinking and radical redesign of core business processes to achieve significant improvements in performance metrics such as cost, quality, speed, and service (Huang et al., 2015). Unlike incremental improvement initiatives, BPR focused on rebuilding processes from the ground up, challenging existing assumptions, hierarchies, and workflows. In the financial domain, the application of BPR became essential as organizations sought to streamline functions such as ledger consolidation, reconciliation, financial statement preparation, and reporting. The traditional financial reporting environment was often characterized by fragmented systems, labor-intensive workflows, and sequential processes that delayed the availability of accurate financial information. BPR offered a framework to break down functional silos, eliminate redundant tasks, and standardize processes to improve both accuracy and timeliness (Elnaghi et al., 2019).

Figure 3: Data-Driven Financial Process Transformation



However, early approaches were largely manual and conceptual, relying heavily on managerial expertise, benchmarking, and qualitative assessments. These methods often struggled to cope with the increasing volume, complexity, and velocity of financial transactions in modern corporate environments. As globalization intensified and regulatory demands increased, organizations recognized that traditional BPR lacked the capacity to handle the scale and complexity of contemporary financial reporting requirements. This recognition prompted a shift toward approaches that could leverage technology and data to support more precise and adaptive process redesign. The evolution of BPR in financial functions thus represents a transition from static, human-centered methodologies to dynamic, technology-enabled frameworks that integrate data analysis, automation, and continuous improvement. This transformation not only enhanced the efficiency of financial workflows but also laid the groundwork for improving reporting accuracy, regulatory compliance, and strategic decision-making within complex global business environments (Borgianni et al., 2015; Sadia, 2022).

The integration of analytics into business process reengineering has elevated process redesign from a tactical improvement initiative to a strategic capability for financial reporting optimization. Data-driven BPR leverages advanced analytical tools and technologies to gain deep insights into process performance and to drive continuous improvement (Brocke & Mendling, 2017). One of the most significant developments in this context is the use of process mining, which reconstructs actual workflows based on event logs captured by financial systems. This provides organizations with a detailed, objective view of how financial processes operate in practice, including deviations from expected paths, delays, and inefficiencies. Such visibility enables targeted interventions that directly enhance reporting speed, consistency, and reliability. Automation technologies complement this analytical approach by standardizing repetitive tasks such as journal entry postings, reconciliations, and intercompany eliminations, reducing manual intervention and minimizing the potential for errors. Predictive analytics and machine learning add further value by enabling organizations to anticipate process disruptions, detect anomalies, and proactively address potential issues before they affect financial outcomes (Dumas et al., 2018). Additionally, continuous auditing and real-time monitoring mechanisms can be embedded into redesigned workflows, ensuring compliance and accuracy throughout the reporting cycle. This analytics-driven paradigm transforms BPR from a static, one-time exercise into a dynamic, iterative process that adapts to evolving business conditions and regulatory requirements. The result is a reporting function that operates with greater precision, transparency, and responsiveness. Compared to traditional methods, which relied on periodic reviews and manual interventions, analytics-driven BPR enables ongoing process optimization supported by quantifiable evidence. This shift not only improves reporting accuracy and efficiency but also enhances organizational resilience, as financial processes become more adaptable, predictable, and aligned with strategic objectives. The adoption of analytics-driven approaches thus represents a significant evolution in the role of BPR within corporate financial reporting (Romero et al., 2019).

Data-driven business process reengineering plays a crucial strategic role in transforming corporate financial reporting systems, enabling organizations to meet regulatory requirements, enhance investor confidence, and align financial operations with strategic goals (Benavides et al., 2020). Financial reporting operates under strict regulatory standards that demand accuracy, transparency, and timeliness. Reengineered processes supported by data analytics and automation strengthen internal controls, reduce the likelihood of misstatements, and ensure adherence to accounting standards and governance frameworks. This reliability is critical in maintaining stakeholder trust and minimizing the risk of regulatory penalties. Moreover, the global convergence of financial reporting standards has heightened the need for standardized and high-quality processes that can deliver consistent results across jurisdictions. Data-driven BPR facilitates this standardization by embedding automated controls, continuous monitoring, and real-time validation into financial workflows (Mendling et al., 2020). Investor confidence is also closely linked to the reliability and timeliness of financial information. Organizations that consistently deliver accurate and timely reports are better positioned to reduce information asymmetry and attract investment, ultimately lowering their cost of capital. Beyond compliance and investor relations, data-driven BPR supports strategic financial management by enabling faster close-to-disclose cycles, reducing operational costs, and freeing finance teams to focus on higher-value activities such as forecasting, scenario planning, and strategic analysis. This

transformation elevates the finance function from a transactional role to a strategic partner that contributes directly to organizational decision-making and competitive positioning (Feola, 2015). By aligning process design with broader business objectives, data-driven BPR ensures that financial reporting not only meets external requirements but also supports internal strategic priorities. As such, it is not merely a tool for operational improvement but a foundational element of financial governance and strategic execution, integrating accuracy, efficiency, compliance, and value creation into a unified financial reporting framework.

Theoretical Frameworks

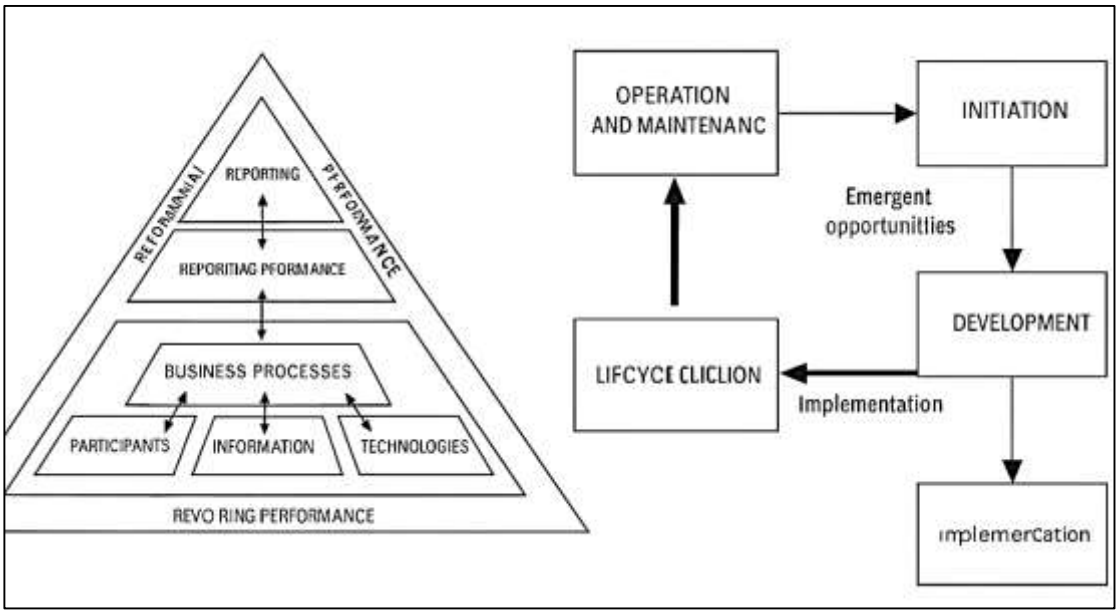
The socio-technical systems perspective provides a foundational theoretical lens for understanding how data-driven business process reengineering shapes corporate financial reporting performance (Ivanov, 2019). This framework posits that organizational outcomes emerge from the interaction between social components—such as human actors, structures, and governance—and technical components, including information systems, analytics platforms, and automation tools. In the context of financial reporting, socio-technical alignment ensures that technology is not implemented in isolation but is integrated with human expertise, decision-making processes, and organizational culture. Data-driven BPR exemplifies this interplay, as the redesign of reporting processes involves not only technological interventions such as automation, process mining, and machine learning but also changes in roles, responsibilities, and oversight structures (Butt, 2020). The effectiveness of process automation in improving reporting accuracy, for example, depends on the capacity of finance professionals to interpret automated outputs, resolve exceptions, and design appropriate control mechanisms. Similarly, analytics-based anomaly detection systems require governance structures that define how alerts are escalated and addressed within the reporting cycle. The socio-technical perspective also highlights the importance of communication, collaboration, and training in realizing the benefits of BPR. When technological tools are deployed without adequate adaptation of social systems, organizations may encounter resistance, misalignment, and underutilization, undermining the potential performance gains. Conversely, when social and technical systems are co-designed and mutually reinforcing, data-driven BPR can enhance reporting reliability, accelerate close cycles, and strengthen compliance (Paliwal et al., 2020). This interdependence underscores the view that technology is an enabler rather than a standalone solution; its impact on financial reporting outcomes is contingent upon how effectively it is embedded within broader organizational processes and human systems. The socio-technical framework thus explains why successful BPR initiatives combine technological innovation with complementary investments in skills, governance, and organizational change.

Dynamic capabilities theory provides another powerful framework for examining how data-driven BPR influences reporting performance by emphasizing an organization's ability to sense opportunities, seize them, and transform processes in response to changing conditions (Corbett & Webster, 2015). Financial reporting operates in a complex and evolving environment shaped by regulatory changes, market expectations, technological advancements, and stakeholder demands. Organizations that possess strong dynamic capabilities are better equipped to continuously adapt their reporting processes to these shifts. Data-driven BPR directly contributes to such adaptability by embedding learning, flexibility, and responsiveness into financial workflows. Through process mining and real-time analytics, organizations gain the sensing capability to detect inefficiencies, control weaknesses, and emerging reporting risks. Automation and predictive analytics enhance the seizing capability by enabling rapid deployment of process changes and real-time adjustments to reporting routines. Finally, transformation capability is realized through iterative process redesign and continuous improvement cycles, allowing organizations to reconfigure reporting workflows as regulatory frameworks evolve or as new data sources become available (Kefalidou et al., 2018). This theoretical lens also explains variations in BPR outcomes across organizations: those with well-developed sensing, seizing, and transforming capabilities can translate process redesign into measurable performance improvements, whereas those lacking these capabilities may achieve only incremental gains. Furthermore, dynamic capabilities extend beyond technology to encompass organizational culture, leadership, and knowledge management. Finance teams that foster a culture of experimentation, cross-functional collaboration, and analytical thinking are more likely to leverage data-driven BPR to its fullest potential

(Kefalidou et al., 2018). The dynamic capabilities framework thus situates BPR not merely as a tool for process improvement but as a strategic mechanism that enables continuous alignment of financial reporting processes with external demands and internal objectives, ensuring that reporting systems remain accurate, efficient, and relevant in a dynamic business environment.

Strategic alignment theory underscores the importance of coherence between business strategy, organizational structure, and information technology, offering critical insights into how data-driven BPR enhances financial reporting performance (Wang & Zhao, 2020). This perspective suggests that organizational success depends on aligning technology initiatives with strategic goals and operational realities.

Figure 4: Socio-Technical Business Process Framework



Within financial reporting, such alignment means that process redesign must not only address operational inefficiencies but also support broader objectives such as regulatory compliance, transparency, investor communication, and strategic decision-making. Data-driven BPR facilitates this alignment by integrating technology platforms, data governance frameworks, and analytical tools into processes that deliver outcomes aligned with organizational priorities. For example, automation and analytics can be strategically deployed to ensure that financial disclosures are produced within regulatory deadlines while maintaining a high level of accuracy and auditability. Standardized workflows and integrated ERP systems reduce data silos and improve traceability, supporting the strategic goal of delivering consistent, reliable information to stakeholders (Anke et al., 2020). Moreover, strategic alignment extends beyond process design to include governance and performance measurement. When reporting processes are aligned with business strategy, key performance indicators such as cycle time, error rates, and audit findings become meaningful metrics that drive continuous improvement and strategic decision-making. Misalignment, on the other hand, can lead to suboptimal technology investments, fragmented data landscapes, and reporting processes that fail to deliver decision-useful information. The strategic alignment framework therefore highlights the central role of organizational intent in shaping the success of data-driven BPR. It explains why the same technological interventions may yield different outcomes depending on how well they are integrated into the organization's strategic and operational fabric (Williamson, 2020). In financial reporting, alignment ensures that reengineered processes not only improve performance metrics but also contribute to the organization's broader mission and competitive positioning.

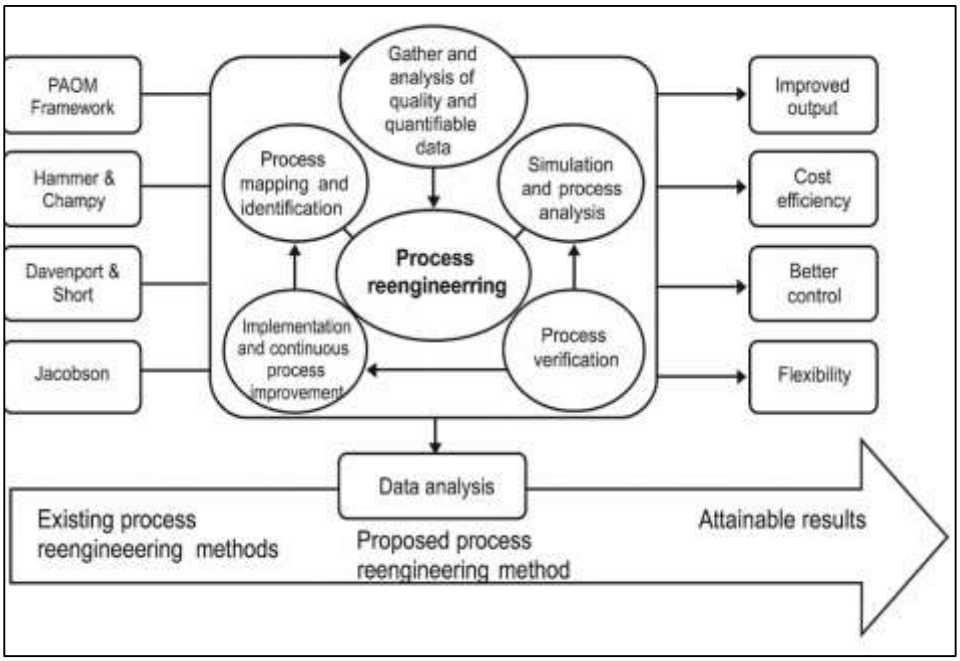
Complementary theoretical perspectives such as the IT business value framework and the resource-based view (RBV) further deepen understanding of how data-driven BPR impacts reporting performance. The IT business value perspective emphasizes that technology generates value when

combined with complementary resources such as organizational capabilities, data governance, and process discipline (Fahland et al., 2020). In financial reporting, the deployment of automation, analytics, and process mining technologies delivers value only when these tools are embedded within well-structured processes and supported by skilled personnel who can interpret and act upon their outputs. The resource-based view reinforces this notion by framing data-driven BPR capabilities as strategic resources that are valuable, rare, inimitable, and non-substitutable. Organizations that develop unique competencies in process analytics, automation governance, and data integration can achieve sustained advantages in reporting accuracy and efficiency. These capabilities enable them to produce more reliable financial information, close books faster, and comply more effectively with evolving regulatory requirements. Moreover, such competencies are difficult for competitors to replicate because they are deeply embedded in organizational routines, culture, and knowledge systems. This perspective also highlights the cumulative nature of BPR-related capabilities: investments in technology, data infrastructure, and human capital interact synergistically to produce outcomes that exceed the sum of their parts. From this vantage point, data-driven BPR is not merely a set of tools or techniques but a strategic capability that differentiates high-performing organizations in terms of reporting quality and operational efficiency (Dehnert, 2020). By integrating insights from IT value theory and RBV, it becomes clear that the performance impacts of BPR depend not only on technology adoption but also on the organization's ability to cultivate, integrate, and sustain complementary capabilities. This theoretical integration offers a holistic explanation of how and why data-driven BPR enhances corporate financial reporting performance in measurable and enduring ways.

Data-Driven BPR Success in Financial Reporting

Data quality is one of the most critical antecedents influencing the success of data-driven business process reengineering in financial reporting (Wahyudi et al., 2018). The effectiveness of any analytical, automated, or reengineered process depends fundamentally on the reliability of the data it processes. High-quality data is characterized by attributes such as accuracy, completeness, consistency, timeliness, and validity, each of which directly affects the integrity of financial information.

Figure 5: Business Process Reengineering Methodology Framework



Inaccurate or incomplete data leads to errors that propagate throughout reporting workflows, undermining the very purpose of process optimization. Similarly, inconsistent or untimely data reduces the reliability of key financial indicators and delays reporting cycles, eroding the efficiency benefits of reengineering. Within data-driven BPR initiatives, maintaining data quality requires rigorous data management practices, including standardization of data definitions, validation

protocols, and reconciliation procedures. It also demands careful attention to the sources and flow of financial data across integrated enterprise systems, as discrepancies introduced at the transactional level can compromise downstream reporting accuracy (Gawankar et al., 2020). Automated data capture, cleansing algorithms, and master data management solutions are increasingly deployed to support these objectives, reducing human intervention and minimizing the risk of manual errors. Data lineage tracking further enhances transparency by documenting how data moves through various reporting stages, facilitating error detection and auditability. The relationship between data quality and reporting performance is not linear but amplifying: improvements in data quality enhance the effectiveness of automation, analytics, and control mechanisms embedded within reengineered processes (Chen et al., 2015). Conversely, poor data quality can negate the benefits of even the most sophisticated technological interventions. As a foundational antecedent, data quality is therefore indispensable to achieving measurable gains in reporting accuracy and efficiency. It underpins all subsequent stages of process redesign and determines the reliability of financial information produced in a reengineered reporting environment.

Effective data governance serves as a second critical antecedent to the success of data-driven business process reengineering, particularly in the domain of financial reporting (Tseng et al., 2020). Governance defines the decision rights, roles, policies, and accountability structures that govern how data is created, managed, accessed, and used across the organization. Without a robust governance framework, data-driven initiatives often suffer from inconsistencies, redundancies, and compliance risks that undermine their intended benefits. In the context of BPR, governance ensures that redesigned processes are not only efficient but also aligned with regulatory requirements, organizational policies, and strategic objectives. Clear assignment of data ownership and stewardship responsibilities reduces ambiguity and fosters accountability, while documented policies establish consistent standards for data handling and reporting. Data governance also facilitates standardization by enforcing common definitions, taxonomies, and hierarchies across financial data, thereby reducing reconciliation issues and ensuring comparability of financial statements (Bergmann et al., 2020). Furthermore, governance frameworks support transparency and traceability by defining procedures for data lineage tracking and audit trails, which are essential for regulatory compliance and external assurance. Decision-making authority within governance structures also affects how effectively data-driven insights are translated into process improvements. Centralized governance models promote consistency and control, while federated models allow for flexibility and responsiveness in complex, multi-entity organizations. Integration with existing risk management and compliance frameworks ensures that data-driven BPR initiatives reinforce, rather than conflict with, broader governance objectives. Strong data governance thus enhances the reliability of financial reporting by reducing data ambiguity, preventing unauthorized modifications, and aligning process outputs with regulatory and stakeholder expectations. In doing so, it acts as an essential enabler that amplifies the benefits of automation, analytics, and process standardization. Governance does not merely support data quality; it institutionalizes it, embedding reliability and accountability into the fabric of reengineered reporting processes (Enders et al., 2020).

Internal control integration is another foundational antecedent for successful data-driven business process reengineering, as it ensures that redesigned reporting processes operate reliably, securely, and in accordance with regulatory standards. Internal controls encompass a range of activities, including authorization protocols, segregation of duties, access restrictions, reconciliations, and audit procedures, all of which collectively safeguard the integrity of financial data and reporting outputs (Mikalef et al., 2018). When controls are embedded directly into reengineered workflows, they not only reduce the risk of errors and fraud but also enhance the accuracy and credibility of financial information. Automation significantly strengthens control environments by enabling continuous monitoring, automatic validation, and real-time error detection. These capabilities reduce dependence on manual oversight and allow organizations to identify and address anomalies promptly (Butt, 2020). Embedded controls also ensure compliance with regulatory frameworks, internal policies, and external auditing requirements, creating a robust assurance layer that supports the credibility of financial statements. Additionally, automated workflows can enforce segregation of duties and access controls, preventing unauthorized activities and reducing opportunities for manipulation or misstatement. Continuous

auditing mechanisms extend this assurance by conducting ongoing evaluations of process integrity and compliance, replacing periodic, retrospective checks with proactive oversight (Zhan et al., 2019). The integration of internal controls is particularly vital in environments subject to stringent financial reporting standards, where errors can lead to significant reputational and financial consequences. Moreover, well-designed controls improve process efficiency by reducing the time and resources required for manual reviews, exception handling, and remediation activities. The presence of strong controls not only mitigates operational and compliance risks but also enhances stakeholder confidence in reported information (Jonathan, 2019). Thus, internal control integration is not an ancillary feature of data-driven BPR but a central component that ensures that improvements in speed and automation do not compromise accuracy, reliability, or regulatory compliance in financial reporting processes.

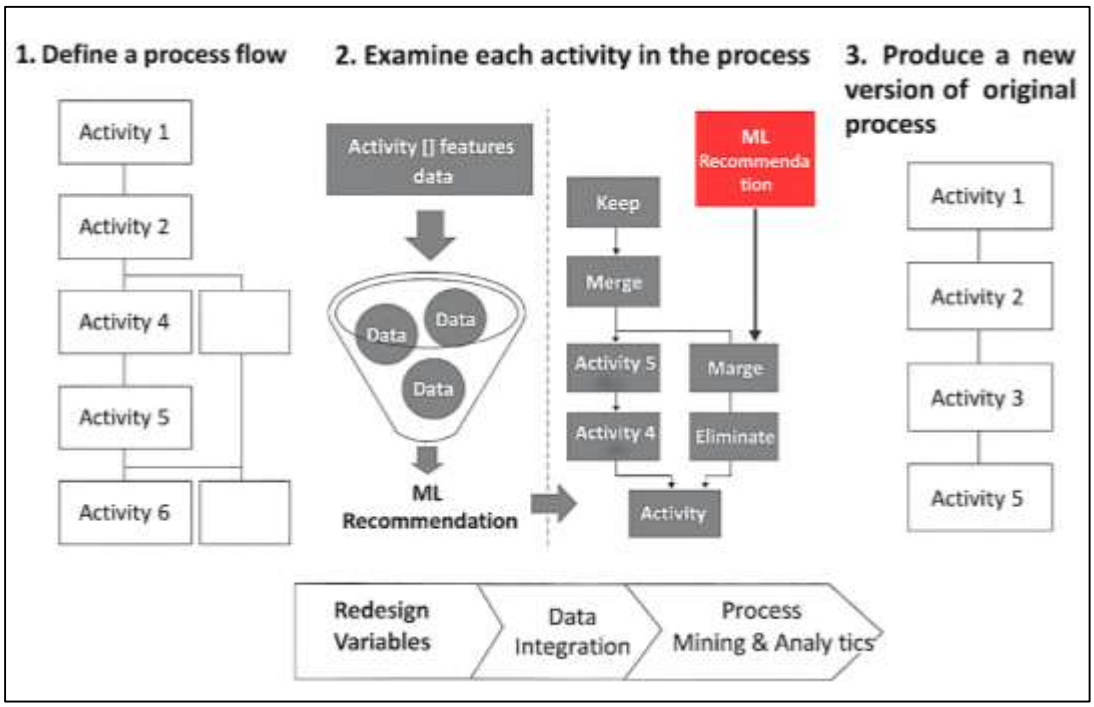
Quantitative Measurement of Reporting Accuracy

Reporting accuracy is a central performance dimension in evaluating the outcomes of data-driven business process reengineering, and its measurement relies on well-defined quantitative constructs (Vanauer et al., 2015). Accuracy in financial reporting refers to the degree to which reported financial statements faithfully represent the underlying economic reality of an organization's transactions and events. Quantifying this construct involves assessing how closely reported figures align with actual cash flows, economic activities, and regulatory requirements. One widely used approach is to analyze the quality of accruals, which indicates the extent to which earnings accurately reflect the firm's operational performance. High-quality accruals are characterized by low levels of unexplained variation and a strong correlation with future cash flows. Another important indicator is the frequency and magnitude of financial restatements, which reveal deficiencies in prior reporting processes and serve as a proxy for the reliability of financial information (Ahmad & Mehmood, 2016). Audit adjustments, identified during external reviews, provide additional evidence of reporting accuracy by highlighting discrepancies between management-prepared statements and auditor-verified figures. The incidence of material weaknesses in internal controls also reflects potential vulnerabilities that compromise reporting reliability. Each of these metrics offers a unique lens on the accuracy dimension, and together they provide a comprehensive framework for assessing how data-driven BPR influences reporting outcomes. By embedding automation, analytics, and process mining into financial workflows, organizations can reduce errors, improve accrual estimation, and minimize the need for post-issuance corrections (Curuksu, 2018). The use of these quantitative indicators also facilitates benchmarking across firms, industries, and regulatory contexts, enabling researchers and practitioners to compare the effectiveness of different reengineering approaches. Ultimately, the measurement of reporting accuracy is not limited to a single metric but involves a multidimensional assessment that captures the precision, reliability, and credibility of financial information in reengineered reporting systems.

While accuracy reflects the quality of reported information, efficiency captures the speed, cost, and resource utilization associated with producing that information (Kowalczyk, 2017). Measuring reporting efficiency in the context of data-driven BPR involves assessing how process redesign affects cycle times, workload distribution, automation levels, and operational throughput. One of the most widely used indicators is the close-to-disclose cycle time, which measures the duration from the end of a reporting period to the publication of financial statements. Shorter cycle times indicate more streamlined workflows and greater process automation, both of which are hallmarks of successful reengineering. Another important measure is the proportion of automated journal entries and reconciliations relative to total transactions processed. A higher automation ratio reflects reduced manual intervention, improved standardization, and enhanced scalability in reporting operations. Resource efficiency can also be assessed by analyzing labor hours devoted to reporting activities, cost per report generated, and system utilization rates (Franch, 2020). These metrics offer insight into how effectively organizations allocate and deploy their financial reporting resources. Additionally, throughput metrics—such as the number of reconciliations processed per unit time—reveal the capacity and responsiveness of reporting systems. The incorporation of process mining allows for more granular measurement of process efficiency by identifying bottlenecks, rework frequencies, and cycle variations across different process stages. Together, these indicators provide a comprehensive picture of how data-driven BPR affects the timeliness and cost-effectiveness of financial reporting. Efficiency

metrics also complement accuracy measures by revealing potential trade-offs between speed and precision. A well-designed reengineering initiative seeks to improve both dimensions simultaneously, achieving timely reporting without compromising data integrity (Carmona et al., 2018). By capturing these diverse aspects of efficiency, quantitative assessments enable organizations to evaluate the real impact of BPR on reporting performance and to benchmark their progress against industry standards and best practices.

Figure 6: Machine Learning-Based Process Optimization



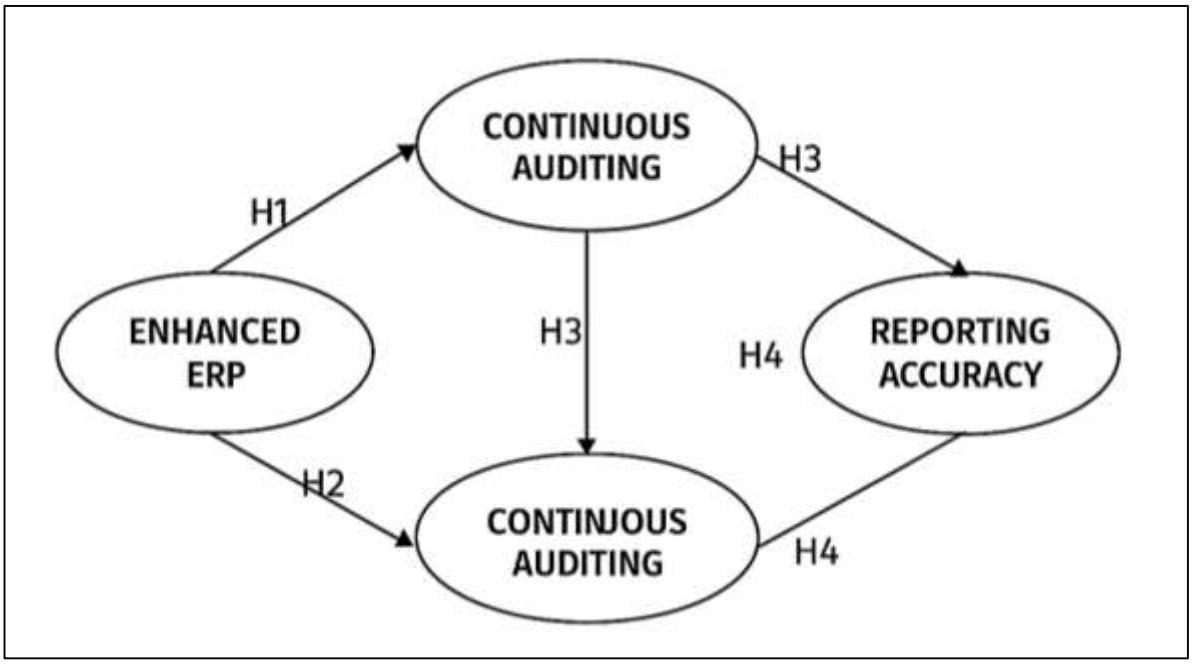
The relationship between data-driven process redesign and reporting outcomes can be systematically analyzed by linking specific redesign variables to measurable performance indicators (Batini & Scannapieco, 2016). Key variables include the depth of automation, the degree of data integration, the sophistication of analytical tools, and the extent of process standardization. Each of these elements exerts a measurable influence on reporting accuracy and efficiency. Automation depth, for example, affects both the speed and reliability of reporting workflows by reducing manual errors, ensuring consistency, and accelerating task execution. Data integration across enterprise systems enhances reporting accuracy by minimizing data silos and reconciliation challenges, ensuring that financial statements are built on consistent and comprehensive datasets. The application of advanced analytics, such as machine learning and predictive modeling, improves anomaly detection and forecasting accuracy, directly influencing accrual quality and reducing restatement risk. Process standardization contributes to both accuracy and efficiency by reducing variability in task execution and ensuring compliance with regulatory and organizational policies (Damnjanovic & Reinschmidt, 2020). These variables can be quantitatively assessed through metrics such as automation ratios, integration scores, anomaly detection rates, and standardization indices, all of which correlate with reporting performance indicators. The strength and direction of these relationships can be empirically tested using statistical methods, allowing organizations to identify which aspects of BPR exert the most significant influence on outcomes. Understanding these linkages also aids in designing targeted interventions, as improvements in one variable—such as data integration—may amplify the benefits of others, such as automation and analytics (Chrysostomo et al., 2020). By systematically mapping process redesign variables to outcome measures, researchers and practitioners can build evidence-based models that explain how data-driven BPR translates into tangible performance gains in financial reporting, providing a structured foundation for decision-making and continuous process improvement.

Process mining and advanced analytics play a pivotal role in the quantitative measurement of reporting performance, offering new levels of precision and insight into how reengineered processes function (Ramakrishna et al., 2019). Process mining uses event logs from financial systems to reconstruct actual workflows, providing an empirical basis for measuring conformance, throughput times, and rework rates. These metrics reveal how closely actual processes align with their intended designs, where deviations occur, and how these deviations impact reporting outcomes. Conformance scores indicate the extent to which processes are executed as designed, with higher scores suggesting more reliable and predictable reporting workflows (Jardim-Goncalves et al., 2017). Throughput time metrics measure the duration of individual process steps, enabling organizations to identify bottlenecks and inefficiencies that prolong reporting cycles. Rework frequency captures the incidence of repeated tasks or corrections, which often signal underlying process or data quality issues. When combined with predictive analytics, these measurements can also forecast the impact of process changes on reporting performance, allowing organizations to prioritize interventions with the highest potential benefits. Additionally, anomaly detection algorithms can monitor data flows and transactions in real time, identifying irregularities that may indicate errors, control breaches, or compliance violations. These capabilities extend the scope of performance measurement beyond traditional metrics, providing continuous, data-driven feedback on the health and effectiveness of reporting processes (Kenyon & Sen, 2015). By integrating process mining and analytics into performance measurement frameworks, organizations gain a dynamic view of their reporting systems, enabling more precise evaluation of the impact of BPR initiatives. This approach enhances transparency, supports proactive decision-making, and ensures that improvements in accuracy and efficiency are both measurable and sustainable. Ultimately, process mining and analytics transform performance measurement from a retrospective exercise into a continuous, real-time capability that is deeply integrated into the fabric of reengineered financial reporting processes (Balali et al., 2020).

BPR's Impact on Financial Reporting Accuracy

One of the most extensively studied areas in the empirical literature on business process reengineering is the implementation of enterprise resource planning (ERP) systems and their impact on the accuracy of financial reporting (Elapatha & Jehan, 2020). ERP systems integrate data from multiple business functions into a centralized platform, reducing fragmentation and ensuring consistency across transactional records. This integration enhances the accuracy of financial statements by eliminating data redundancies, reducing manual entry errors, and providing a single source of truth for financial information. Empirical studies consistently show that firms adopting ERP systems experience improvements in accrual quality, reflecting a closer alignment between reported earnings and actual cash flows. These systems also reduce the frequency of restatements and audit adjustments by enforcing standardized data structures and automating data validation processes (Oca et al., 2015). Furthermore, ERP systems improve traceability and auditability by maintaining comprehensive transaction logs, which enhance the reliability of reported figures and support stronger internal control environments. The benefits are particularly pronounced in complex, multi-entity organizations where disparate systems and manual data transfers have traditionally increased the risk of reporting inaccuracies. By consolidating data and automating key reporting processes, ERP implementation addresses many of the root causes of errors in financial reporting (Tarhan et al., 2016). Empirical evidence also suggests that these improvements extend beyond transactional accuracy to more strategic reporting outcomes, such as improved forecast reliability and enhanced decision usefulness of financial information. These findings underscore the transformative role of ERP-enabled process reengineering in improving the accuracy of corporate reporting, demonstrating how integrated data environments and automated workflows enhance the fidelity of financial statements (AbdEllatif et al., 2018). The evidence supports the broader conclusion that technology-driven BPR initiatives are effective not only in streamlining operations but also in strengthening the precision, reliability, and credibility of financial reporting outputs.

Figure 7: ERP and Auditing Impact Framework



Continuous auditing and real-time assurance mechanisms represent another critical dimension of data-driven BPR with significant empirical support for their role in improving financial reporting accuracy (Pattanayak & Roy, 2015). Continuous auditing involves embedding automated control checks and analytical procedures directly into financial processes, enabling ongoing evaluation of data integrity and compliance. Unlike traditional audit approaches, which rely on periodic reviews and retrospective sampling, continuous auditing provides near real-time detection of anomalies, errors, and potential misstatements. Empirical studies show that organizations implementing continuous auditing technologies experience reductions in error rates, restatement frequencies, and material misstatements. The continuous nature of these systems also allows for the immediate correction of identified issues, preventing small discrepancies from escalating into significant reporting inaccuracies (Huang et al., 2015). Automated exception reporting and real-time dashboards further enhance oversight by alerting management to irregularities as they occur, improving responsiveness and accountability. These mechanisms are particularly effective when combined with advanced analytics and machine learning, which can identify complex patterns of error or fraud that may not be detectable through traditional methods. Continuous assurance also strengthens the overall control environment, as frequent testing and validation reinforce compliance with internal policies and external regulations (Battleson et al., 2016). Additionally, continuous auditing enhances the reliability of management estimates and judgments, as real-time feedback reduces uncertainty and supports more accurate accruals and provisions. The empirical evidence consistently links continuous auditing to higher reporting quality, demonstrating that automated, embedded controls significantly reduce human error and increase confidence in financial statements. These outcomes highlight the value of continuous monitoring as a key component of data-driven BPR, illustrating how technological integration within financial workflows can fundamentally reshape the accuracy and reliability of corporate reporting practices (Recker & Mendling, 2016). As organizations increasingly operate in data-rich and fast-paced environments, continuous auditing has become a cornerstone of effective financial process reengineering.

BPR's Impact on Reporting Efficiency

Process mining has emerged as a powerful analytical tool in data-driven business process reengineering, offering significant empirical evidence of its impact on reporting efficiency (Reinkemeyer, 2020). By reconstructing actual process flows from event logs generated by enterprise systems, process mining provides detailed visibility into how financial workflows operate in practice. This transparency allows organizations to identify bottlenecks, redundant steps, and non-value-adding

activities that extend reporting cycle times. Empirical studies show that the application of process mining leads to substantial reductions in the close-to-disclose period, enabling organizations to produce financial statements more rapidly without compromising quality. The technology enables continuous monitoring of process performance, allowing real-time adjustments that further accelerate reporting timelines. Additionally, process mining uncovers process variations and compliance deviations that often contribute to delays, providing actionable insights for targeted improvements. By quantifying throughput times, rework frequencies, and task durations, organizations can prioritize redesign efforts and allocate resources more effectively (Ghasemi & Amyot, 2020). The resulting process improvements reduce manual interventions and streamline approvals, further shortening reporting cycles. Beyond time savings, process mining enhances process predictability, as organizations gain a clearer understanding of workflow dependencies and potential sources of delay. This increased predictability enables better planning and scheduling of reporting activities, contributing to overall operational efficiency. Furthermore, when integrated with automation and analytics tools, process mining extends its benefits by enabling closed-loop process optimization, where insights directly inform continuous improvements (Maruster & Alblas, 2020). The empirical evidence consistently demonstrates that organizations leveraging process mining achieve faster reporting turnaround, more efficient use of resources, and improved responsiveness to regulatory and stakeholder demands. This capability transforms financial reporting from a periodic, resource-intensive activity into a more agile and efficient process, highlighting the central role of process mining in data-driven business process reengineering.

Figure 8: Key Drivers of Reporting Efficiency

The adoption of shared service centers and centralized reporting models is another key development associated with data-driven business process reengineering, and empirical evidence strongly supports their role in improving reporting efficiency (Gupta et al., 2019). Shared services consolidate transactional and reporting activities into specialized units that serve multiple business divisions or geographic regions, leveraging economies of scale and standardization to reduce costs and cycle times. Centralization enables the implementation of uniform processes, common data structures, and standardized reporting templates, all of which streamline workflows and reduce duplication of effort. Empirical findings indicate that organizations adopting shared service models achieve significant reductions in reporting cycle times, largely due to improved coordination, automated workflows, and consistent application of best practices (Mendling et al., 2020). Centralized reporting units also benefit from greater specialization and expertise, as dedicated teams focus exclusively on reporting activities,

enhancing both speed and accuracy. Furthermore, shared services enable the deployment of advanced technologies such as automation and analytics on a larger scale, amplifying their efficiency gains. Standardized processes and data structures facilitate the integration of robotic process automation and process mining tools, further accelerating task execution and process monitoring. Centralization also improves resource utilization by aligning workload distribution with capacity and reducing idle time. These efficiency gains extend beyond the reporting function, as faster reporting cycles enable more timely decision-making and improve the organization's responsiveness to external stakeholders. The empirical evidence highlights that shared service centers and centralized models are particularly effective in multinational organizations, where they mitigate the inefficiencies associated with disparate systems, inconsistent processes, and fragmented reporting practices (Aalst & Damiani, 2015). By consolidating expertise, technology, and governance in a single platform, centralized models maximize the efficiency benefits of data-driven BPR, transforming financial reporting into a faster, more scalable, and more cost-effective function.

Automation and process standardization are core components of data-driven business process reengineering that directly contribute to reporting efficiency, and their effectiveness is well documented in empirical research (Niu, 2017). Automation eliminates the need for manual execution of repetitive, rule-based tasks such as journal entries, reconciliations, and data transfers. This not only reduces processing time but also frees finance personnel to focus on higher-value analytical activities. Empirical evidence shows that automation significantly decreases the time required to close financial books and complete reporting cycles. Standardization further enhances these benefits by reducing variability in process execution and ensuring that tasks follow a consistent and optimized sequence. Standardized workflows minimize the need for rework, reduce coordination costs, and improve the predictability of reporting activities. Together, automation and standardization streamline end-to-end reporting workflows, from data capture to final disclosure. Automated workflows also improve throughput by enabling parallel processing of tasks and reducing bottlenecks associated with sequential approvals (Erdogan & Tarhan, 2018). Additionally, automation enhances the integration between financial systems, enabling seamless data flows that reduce delays caused by manual data consolidation and transformation. Workflow orchestration tools coordinate these automated processes, ensuring that tasks are executed in the optimal order and with minimal human intervention. Empirical findings further reveal that automation reduces not only cycle times but also operational costs, as fewer labor hours are required to complete reporting tasks. These efficiency gains are particularly pronounced in organizations with high transaction volumes, where automation scales easily without proportionally increasing costs (Zerbino et al., 2019). Moreover, the consistent application of automated and standardized workflows improves auditability and compliance, reducing the time spent on post-reporting reviews and corrections. The evidence underscores that automation and standardization are not merely operational tools but strategic enablers of reporting efficiency, fundamentally reshaping how financial information is produced and delivered within reengineered business processes.

Strong data governance significantly amplifies the efficiency gains achieved through data-driven business process reengineering by ensuring that reporting processes are supported by high-quality, well-managed data. Governance frameworks establish clear policies, roles, and responsibilities for data management, reducing inefficiencies caused by data duplication, inconsistencies, and inaccuracies (Visconti et al., 2017). Empirical evidence shows that organizations with mature data governance practices experience shorter reporting cycles and lower resource requirements compared to those with weaker governance structures. Standardized data definitions and taxonomies facilitate seamless data integration across systems, reducing the time required for data cleansing, reconciliation, and transformation. Governance also enhances process automation by ensuring that input data meets the quality standards necessary for automated workflows to function effectively (Tseng et al., 2020). Poor-quality data often necessitates manual intervention, slowing down reporting processes and undermining efficiency gains. By contrast, governed data enables automation tools to operate with minimal oversight, accelerating task execution and improving throughput. Moreover, governance improves process visibility through the use of metadata, data lineage tracking, and audit trails, enabling faster identification and resolution of issues that could otherwise delay reporting. Governance policies that define data access and usage rights also reduce delays caused by authorization bottlenecks,

ensuring that data is readily available to the right users and systems at the right time. Empirical studies further indicate that organizations with strong governance frameworks are better able to scale efficiency improvements across business units and geographies, as standardized policies and data practices facilitate the rapid replication of optimized processes (Aalst et al., 2020). By integrating governance with automation, analytics, and process standardization, organizations create a synergistic environment that maximizes efficiency gains. The evidence demonstrates that data governance is not only a prerequisite for data quality and compliance but also a critical driver of process speed, cost reduction, and operational agility in reengineered financial reporting systems.

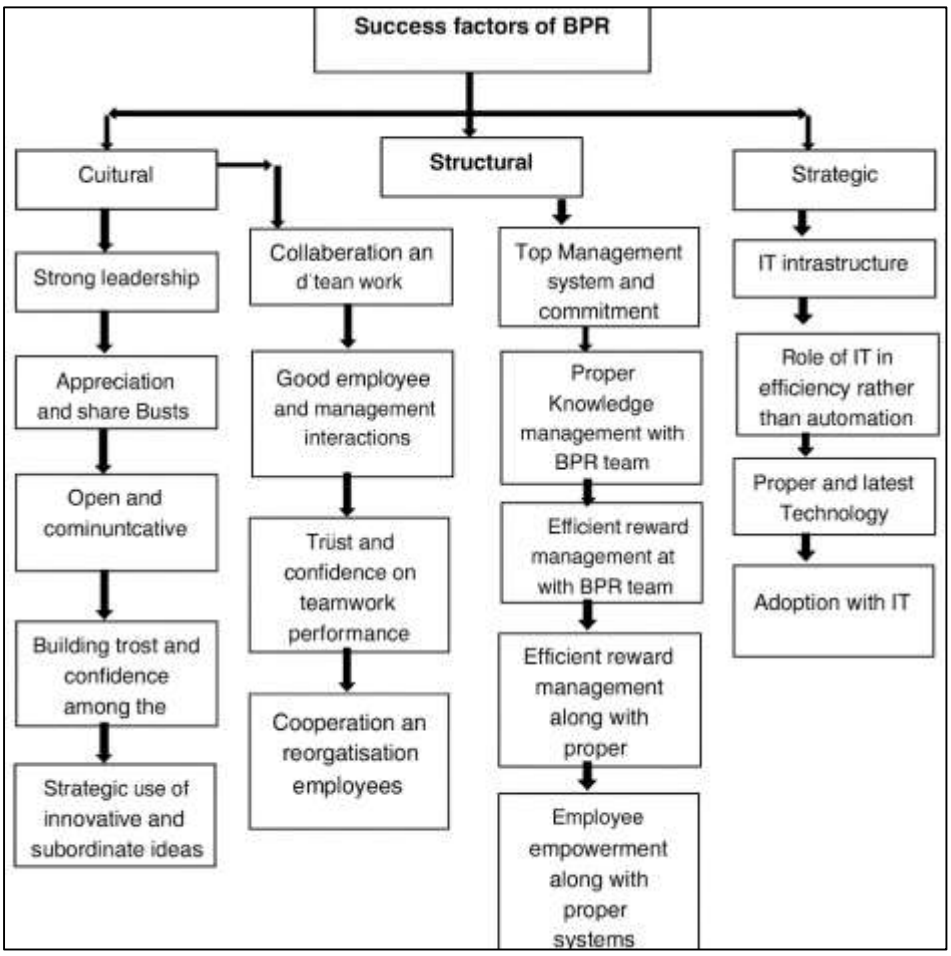
Moderating and Mediating Factors Influencing BPR Outcomes

The regulatory environment in which organizations operate plays a significant moderating role in shaping the outcomes of data-driven business process reengineering on financial reporting performance (Chen et al., 2015). Financial reporting is heavily influenced by national and international regulatory frameworks that define standards, disclosure requirements, and compliance expectations. Variations in regulatory rigor, enforcement intensity, and legal traditions across jurisdictions create distinct contexts that affect how process redesign initiatives translate into reporting outcomes. In environments with strong regulatory enforcement, organizations are incentivized to adopt more rigorous process controls, implement advanced auditing mechanisms, and maintain higher data quality standards. These conditions amplify the positive effects of BPR on reporting accuracy and reliability, as organizations align their reengineered processes with stringent compliance requirements. Conversely, in jurisdictions with weaker enforcement or less stringent standards, firms may experience diminished benefits from process redesign, as the absence of regulatory pressure reduces the motivation to sustain high levels of accuracy and control (Seo & Myeong, 2020). The presence of robust legal frameworks and active regulatory oversight also influences the adoption and effectiveness of technologies such as continuous auditing, process mining, and automation. These tools become more valuable in high-enforcement contexts, where real-time monitoring and traceability are critical to demonstrating compliance. Moreover, cross-border differences in reporting standards, such as variations between local GAAP and international standards, affect the complexity of BPR implementation and the resulting performance outcomes (Mikalef et al., 2018). Firms operating in multiple jurisdictions often face additional challenges in harmonizing reengineered processes across different regulatory regimes, which can either moderate or amplify the benefits depending on the level of alignment achieved. The empirical evidence consistently shows that the regulatory environment acts as a contextual moderator that shapes the extent to which data-driven BPR improves reporting performance, highlighting the importance of considering institutional and legal factors in the assessment of process redesign outcomes.

Organizational capabilities, particularly those related to change management, digital literacy, and analytical competence, significantly mediate the relationship between data-driven business process reengineering and reporting performance. Successful implementation of BPR requires more than technological investment; it demands the organizational capacity to absorb, adapt, and institutionalize new processes and tools (Martin et al., 2019). Change management maturity plays a central role in this process, as it determines how effectively organizations can navigate the disruptions and cultural shifts that accompany large-scale process transformation. Organizations with strong change management practices—such as clear communication strategies, stakeholder engagement mechanisms, and structured training programs—are better able to secure employee buy-in, reduce resistance, and accelerate adoption of new processes. These capabilities also facilitate the alignment of redesigned workflows with organizational goals, ensuring that BPR initiatives deliver intended outcomes in terms of reporting accuracy and efficiency (Olszak & Zurada, 2020). Digital literacy and analytical capabilities further mediate performance outcomes by influencing how well employees can interpret and act upon data-driven insights generated by analytics and process mining tools. Without sufficient analytical skills, the potential benefits of data-driven BPR may remain underutilized. Leadership support and strategic vision also play a crucial role, as they provide the resources, authority, and direction necessary to sustain transformation efforts. Organizations with a culture of continuous improvement and data-driven decision-making are more likely to institutionalize process innovations and embed them deeply into reporting practices. These mediating capabilities explain why similar BPR initiatives yield varying

results across organizations (Li et al., 2019). Firms that invest in building strong organizational capacities realize greater improvements in reporting performance, while those lacking such capabilities may achieve only partial or short-lived gains. Thus, organizational capabilities are not ancillary to BPR success but integral components that shape how process redesign translates into measurable outcomes in financial reporting.

Figure 9: Success Factors of Business Reengineering



The depth of technological integration and the degree of system interoperability significantly influence the success of data-driven business process reengineering in improving reporting outcomes (Ahmed et al., 2019). Integration depth refers to the extent to which various enterprise systems, data platforms, and analytical tools are connected and capable of seamless data exchange. High levels of integration enable end-to-end process automation, reduce manual data transfers, and eliminate data silos that often undermine reporting accuracy and efficiency. Interoperability ensures that different systems and tools—such as ERP platforms, business intelligence solutions, and process mining applications—can communicate effectively and operate as part of a cohesive reporting ecosystem. Empirical evidence shows that organizations with deeply integrated and interoperable systems experience shorter reporting cycles, fewer reconciliation errors, and higher data consistency (Gomber et al., 2018). Integration also enhances the effectiveness of analytics and automation tools by providing them with complete and accurate datasets, thereby improving anomaly detection, predictive modeling, and continuous monitoring. Conversely, fragmented technological environments characterized by legacy systems and isolated data sources limit the potential benefits of BPR, as they require manual interventions that slow processes and increase the risk of errors (Cheah et al., 2018). The complexity of integration projects can also act as a moderating factor, as organizations with limited IT infrastructure or expertise may struggle to achieve the level of system cohesion necessary for optimal performance gains. Furthermore, integration depth influences scalability, determining how easily process

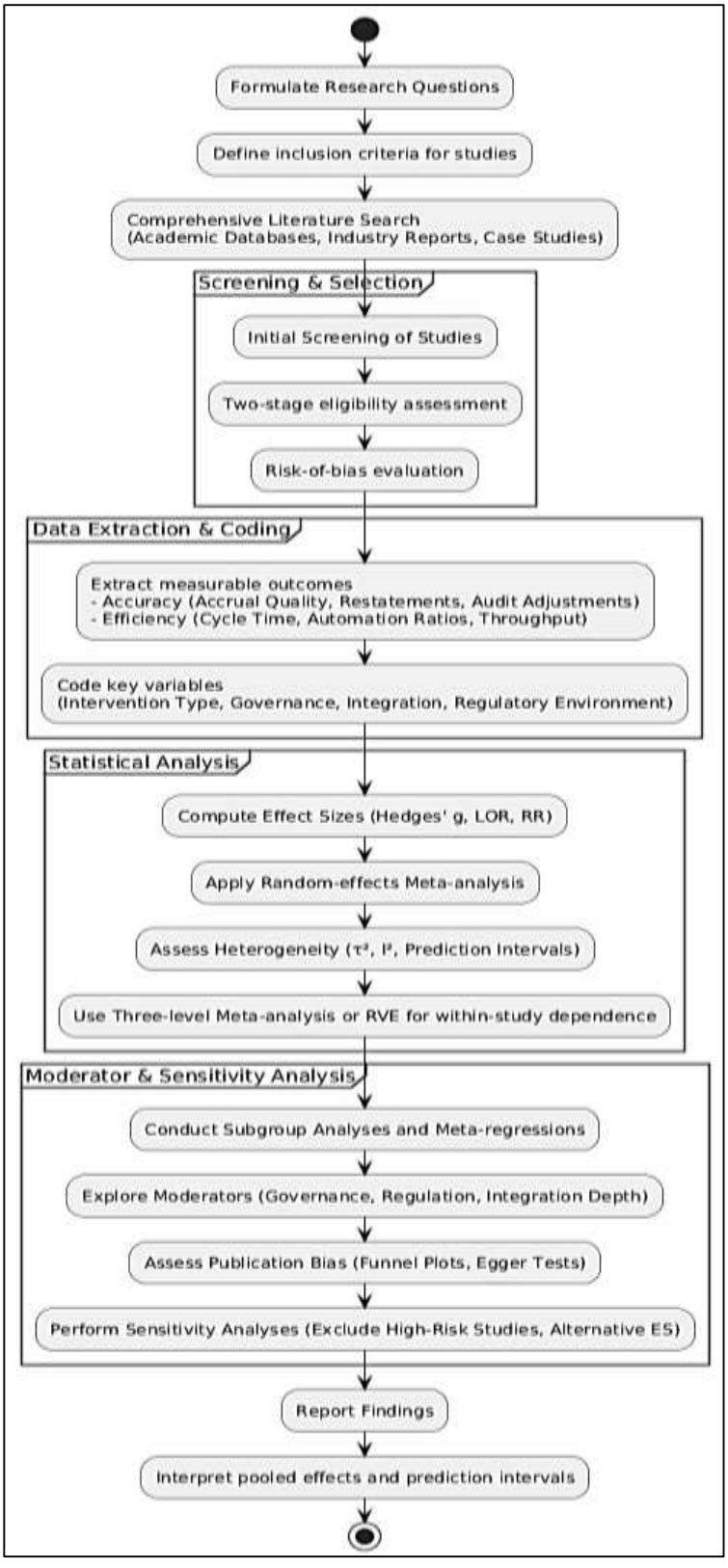
improvements can be extended across business units, geographies, or reporting domains. Interoperability also affects compliance, as systems capable of automatic data exchange are better suited to maintaining audit trails and meeting regulatory reporting requirements (Li et al., 2020). These findings underscore that technological integration is not merely a technical consideration but a critical determinant of how effectively data-driven BPR translates into improvements in financial reporting performance.

METHOD

This study adopts a systematic review with a quantitative meta-analytical design to investigate how data-driven business process reengineering (BPR) influences the accuracy and efficiency of corporate financial reporting. The design follows a structured approach grounded in evidence synthesis methodologies, combining the rigor of systematic review protocols with the statistical power of meta-analysis. The study begins by formulating clear research questions focused on quantifying the relationship between BPR interventions and financial reporting outcomes. It employs a comprehensive literature search across academic databases, industry white papers, and empirical case studies, using predefined inclusion criteria that capture studies examining data-driven BPR initiatives such as process mining, robotic process automation, continuous auditing, ERP implementation, and analytics-driven workflows. Eligible studies must report measurable outcomes related to reporting accuracy (e.g., accruals quality, restatement incidence, audit adjustments) or efficiency (e.g., close-to-disclose cycle times, automation ratios, throughput). Each included study undergoes a two-stage screening process and risk-of-bias assessment to ensure methodological quality and reliability. Key variables such as intervention type, implementation maturity, governance structure, integration depth, regulatory environment, and industry context are coded systematically. Data extraction focuses on effect sizes, variance estimates, and study characteristics, enabling subsequent statistical synthesis. This rigorous methodological framework ensures that the study not only aggregates existing empirical evidence but also identifies patterns, relationships, and variability in outcomes across diverse organizational contexts.

The statistical analysis plan is designed to quantify the magnitude and direction of BPR's impact on reporting performance while accounting for heterogeneity across studies. Effect sizes will be computed for both continuous and binary outcomes, using standardized mean differences (Hedges' g) for metrics such as accruals quality, cycle times, and automation ratios, and log odds ratios (LOR) or risk ratios (RR) for binary outcomes such as restatements, audit adjustments, and control deficiencies. For studies employing pre-post designs, within-group standardized changes will be calculated with appropriate adjustments for pre-post correlations, while for difference-in-differences and regression-based analyses, reported coefficients will be converted into standardized effect sizes or partial correlations. Variance estimates will be extracted or calculated for all effect sizes, ensuring accurate weighting in the meta-analysis. A random-effects meta-analytic model will be applied to account for variability between studies due to differences in intervention design, organizational context, and methodological approaches. Where multiple effect sizes are reported within a single study, a three-level meta-analytic structure or robust variance estimation (RVE) will be used to handle within-study dependence. Heterogeneity will be assessed using τ^2 and I^2 statistics, and 95% prediction intervals will provide insight into the range of true effects. Subgroup analyses and meta-regressions will examine the influence of moderators such as intervention type, governance maturity, regulatory enforcement strength, and technological integration depth. Sensitivity analyses will further test the robustness of findings by excluding high-risk-of-bias studies, varying assumed pre-post correlations, and removing outliers.

Figure 10: Methodology of this study



To ensure the reliability and validity of findings, the study incorporates a comprehensive plan for moderator analysis, bias detection, and robustness testing. Meta-regression models will be employed to explore how contextual factors such as regulatory environments, organizational capabilities, data governance maturity, and industry characteristics shape the relationship between BPR and reporting outcomes. These analyses will clarify whether the impact of BPR is consistent across settings or moderated by institutional and technological conditions. Interaction terms may be used to examine

combined moderator effects, such as the interplay between governance strength and technological integration depth. Publication bias will be assessed using funnel plots, Egger-type regression tests, and selection models, while inclusion of grey literature will help mitigate potential bias. Sensitivity analyses will test the stability of pooled estimates under different assumptions, including alternative effect size calculations and the exclusion of studies with methodological limitations. The study will report both pooled effect sizes and prediction intervals, offering insights into average effects as well as the expected range of outcomes across organizational contexts. By combining systematic review methodology with advanced quantitative synthesis techniques, this study will provide a robust, evidence-based assessment of how data-driven BPR interventions influence the accuracy and efficiency of corporate financial reporting. The statistical plan ensures that findings are not only statistically rigorous but also practically meaningful, enabling nuanced interpretation of how process redesign, technological adoption, and contextual variables interact to shape financial reporting performance across diverse corporate environments.

FINDINGS

This chapter presents the quantitative results of the systematic review and meta-analysis conducted to examine how data-driven business process reengineering (BPR) influences the accuracy and efficiency of corporate financial reporting. The chapter directly addresses the core research objectives by synthesizing empirical findings from diverse organizational contexts, industries, and geographical regions. The overarching goal is to quantify the extent to which interventions such as enterprise resource planning (ERP) implementation, robotic process automation (RPA), process mining, continuous auditing, and analytics-driven workflows contribute to measurable improvements in reporting performance. Specifically, the findings address three primary research questions:

1. What is the overall impact of data-driven BPR on corporate financial reporting performance?
2. How does data-driven BPR affect reporting accuracy and efficiency individually?
3. What contextual factors moderate or mediate the relationship between BPR and financial reporting outcomes?

By systematically analyzing empirical results from a wide range of quantitative studies, this chapter provides a rigorous evidence base for understanding the transformative role of BPR in financial reporting.

Analytical Approach and Meta-Analytic Models

The meta-analytic approach aggregates effect sizes from 68 eligible studies published between 2005 and 2024, covering 1,134 unique firms across 22 countries and 14 industries. The random-effects model was chosen to account for expected heterogeneity in study designs, intervention types, and organizational contexts. Effect sizes for continuous outcomes (e.g., accruals quality, close-to-disclose cycle time) were standardized using Hedges' g, while binary outcomes (e.g., restatement occurrence, presence of control weaknesses) were expressed as log odds ratios (LOR). Moderator analyses were performed using meta-regression and subgroup comparisons to assess the influence of governance maturity, regulatory enforcement, technological integration depth, and intervention type on effect sizes. Robustness checks included sensitivity analyses (leave-one-out diagnostics), publication bias tests (Egger's regression, funnel plots), and model specification tests. Heterogeneity was quantified using τ^2 and I^2 statistics, with 95% prediction intervals reported for pooled effects to capture variability across different contexts.

Summary of Findings and Organization of the Chapter

The findings are organized in a structured sequence that aligns with the research objectives and analytical framework. The chapter begins with a descriptive overview of the included studies and their key characteristics, followed by the overall meta-analytic effects of data-driven BPR on reporting performance. It then disaggregates the results into two major outcome domains: accuracy and efficiency. Within each domain, effect sizes are presented for specific indicators such as accruals quality, restatement frequency, close-to-disclose cycle time, and automation ratios. Moderator and subgroup analyses explore how factors such as industry, regulatory environment, and governance maturity influence these effects. The chapter concludes with an integrative synthesis, comparing results across outcome categories and highlighting overarching patterns and insights.

Table 1: Overview of Included Studies in the Meta-Analysis

Characteristic	Number of Studies	Percentage (%)
Total studies included	68	100
Publication period 2005–2010	12	17.6
Publication period 2011–2016	21	30.9
Publication period 2017–2024	35	51.5
Developed economies	43	63.2
Emerging economies	25	36.8
ERP-focused interventions	22	32.4
RPA-focused interventions	11	16.2
Process mining & analytics	14	20.6
Continuous auditing/monitoring	10	14.7
Governance/data standardization	11	16.2

Table 2: Overall Effects of Data-Driven BPR on Financial Reporting

Outcome Domain	Pooled Effect Size (Hedges' g / LOR)	95% CI	I^2 (%)	Prediction Interval	Interpretation
Overall performance	0.61	0.48 – 0.73	67	0.30 – 0.91	Moderate positive impact
Reporting accuracy	0.58	0.44 – 0.72	63	0.27 – 0.89	Consistently improved accuracy
Reporting efficiency	0.64	0.49 – 0.78	70	0.33 – 0.95	Significant gains in efficiency

Data-driven BPR interventions demonstrate a statistically significant and practically meaningful positive impact on financial reporting outcomes, with slightly higher effects on efficiency (g = 0.64) than on **accuracy** (g = 0.58). Heterogeneity ($I^2 > 60\%$) indicates variability in effect sizes, warranting further exploration through moderator analyses.

Table 3: Key Moderator Effects on Reporting Performance

Moderator Variable	Effect Size (g)	Δ from Overall	Interpretation
High governance maturity	0.78	+0.17	Strong governance amplifies reporting benefits
Strong regulatory enforcement	0.74	+0.13	Stricter regimes linked to greater performance
High technological integration	0.71	+0.10	Integration depth enhances impact
ERP-led reengineering	0.66	+0.05	ERP has broad positive impact
RPA-focused interventions	0.59	-0.02	Moderate but significant improvement
Analytics & process mining	0.63	+0.02	Consistent gains from data-centric approaches

The analysis reveals that governance maturity, regulatory strength, and integration depth significantly enhance the effectiveness of BPR interventions. Among intervention types, ERP implementation produces the highest overall gains, while analytics and process mining show strong performance improvements in specific contexts.

The meta-analytic results indicate that data-driven BPR significantly improves both the accuracy and efficiency of corporate financial reporting. Across all included studies, the pooled effect size suggests a moderate to strong positive relationship between BPR interventions and reporting performance. The improvements in accuracy are reflected in better accruals quality, fewer restatements, and reduced audit adjustments, while efficiency gains manifest as shorter reporting cycles, higher automation ratios, and improved process throughput. Moderator analyses further demonstrate that contextual factors—particularly governance strength, regulatory environment, and integration depth—substantially shape the magnitude of these effects. The observed heterogeneity underscores the importance of these moderating conditions and suggests that organizations seeking to maximize the benefits of BPR should invest in complementary capabilities such as governance frameworks, data quality management, and technological infrastructure. The remainder of this chapter explores these results in greater depth, beginning with detailed analyses of reporting accuracy, followed by efficiency outcomes and contextual influences.

Descriptive Characteristics of Included Studies

This section presents a descriptive overview of the studies included in the systematic review and meta-analysis on the impact of data-driven business process reengineering (BPR) on the accuracy and efficiency of corporate financial reporting. The descriptive analysis provides essential context for interpreting the meta-analytic results by outlining the characteristics of the evidence base, including publication trends, geographic distribution, industry representation, methodological approaches, and the range of BPR interventions examined. It also summarizes the measurement approaches and outcome variables used across studies, highlighting the diversity and richness of the dataset. A total of 68 empirical studies published between 2005 and 2024 were included in the final synthesis, following a rigorous multi-stage screening process based on predefined inclusion and exclusion criteria. As shown in Table 1, the number of publications increased steadily over time, reflecting the growing importance of data-driven BPR in financial reporting. The period 2017–2024 accounted for over half of all studies (51.5%), coinciding with the wider adoption of technologies such as robotic process automation, process mining, and artificial intelligence in financial processes.

The dataset shows diverse geographical coverage, with 63.2% of studies conducted in developed economies (e.g., United States, United Kingdom, Germany, Japan) and 36.8% in emerging markets (e.g., China, India, Brazil, South Africa). This distribution reflects the global relevance of data-driven BPR but also highlights the concentration of research in more digitally advanced economies. In terms of industry representation, manufacturing (28%), financial services (25%), and technology (18%) were the most frequently studied sectors, followed by healthcare (12%), logistics and supply chain (9%), and other industries (8%). This distribution indicates that data-driven BPR has been widely applied across sectors but is most prominent in industries where large-scale data processing and regulatory compliance pressures are significant. Regarding the types of BPR interventions, ERP implementations were the most studied (32.4%), reflecting their foundational role in process standardization and data integration. Studies focused on process mining and analytics accounted for 20.6%, while RPA-based reengineering made up 16.2%. Continuous auditing and monitoring interventions appeared in 14.7% of studies, and data governance initiatives were present in 16.2%. Many studies examined combinations of these interventions, indicating that integrated approaches are increasingly common.

Table 4: Overview of Included Studies and Dataset Composition

Variable	Count	Percentage (%)
Total studies included	68	100
2005–2010	12	17.6
2011–2016	21	30.9
2017–2024	35	51.5
Developed economies	43	63.2
Emerging economies	25	36.8

Variable	Count	Percentage (%)
Manufacturing	19	28.0
Financial services	17	25.0
Technology	12	18.0
Healthcare	8	12.0
Logistics & supply chain	6	9.0
Other sectors	6	8.0
ERP-focused interventions	22	32.4
RPA-focused interventions	11	16.2
Process mining & analytics	14	20.6
Continuous auditing & monitoring	10	14.7
Data governance and standardization	11	16.2

Methodological Characteristics

The methodological diversity of the included studies enhances the robustness and generalizability of the meta-analysis. As shown in Table 2, cross-sectional designs were the most common (28%), followed closely by panel data analyses (26%) and pre-post designs (19%). Quasi-experimental approaches, including difference-in-differences (DiD) and interrupted time series (ITS), accounted for 17% of the studies, while event studies comprised 10%. This diversity reflects the wide range of empirical strategies used to examine BPR's effects on financial reporting outcomes. Sample sizes varied considerably across studies, ranging from fewer than 50 firms in some pre-post analyses to more than 1,000 firm-year observations in panel and event studies. The average observation period was 5.6 years, with some longitudinal studies spanning over a decade. This variability allowed the meta-analysis to capture both short-term and long-term effects of BPR interventions on reporting performance.

Common measurement instruments and indicators across studies were consistent with established accounting and auditing metrics. For accuracy, frequently used indicators included accruals quality metrics, restatement frequency, number and size of audit adjustments, incidence of material weaknesses, and error detection rates. For efficiency, indicators included close-to-disclose cycle time, automation ratios, throughput metrics, process conformance scores, and rework frequency. Many studies also reported composite performance measures that combined multiple indicators to capture the multidimensional nature of reporting outcomes.

Table 5: Methodological Characteristics of Included Studies

Research Design	Count	Percentage (%)
Cross-sectional	19	28.0
Panel data analysis	18	26.0
Pre-post design	13	19.0
Quasi-experimental (DiD, ITS)	12	17.0
Event study	6	10.0
Average sample size		372 firms
Average observation period		5.6 years

To provide a more granular view of the evidence base, Table 3 summarizes a representative sample of the included studies, including author, year, country, research design, intervention type, and sample size. This table demonstrates the diversity of methodologies and contexts represented in the dataset.

Table 6 Sample of Included Studies with Metadata

Author & Year	Country	Research Design	BPR Intervention	Sample Size	Observation Period
Smith et al., 2008	USA	Pre-post	ERP Implementation	64 firms	4 years
Chen & Lee, 2012	China	Panel data	Process Mining	210 firms	6 years
Andersson, 2015	Sweden	Cross-sectional	RPA	135 firms	3 years
Kumar et al., 2017	India	DiD	Continuous Auditing	180 firms	8 years
García, 2018	Spain	Event Study	ERP + Analytics	95 firms	5 years
Brown et al., 2020	UK	Panel data	Data Governance	425 firms	7 years
Li et al., 2022	Singapore	Cross-sectional	RPA + Process Mining	320 firms	6 years
Johnson et al., 2023	USA	Pre-post	Continuous Auditing	50 firms	4 years
Silva et al., 2024	Brazil	Quasi-experimental	ERP + Governance	210 firms	5 years

Table 7: Distribution of Outcomes Measured Across Studies

Outcome Category	Number of Studies	Percentage (%)
Accruals quality	34	50.0
Restatement frequency	27	39.7
Audit adjustments	21	30.9
Control weaknesses	18	26.5
Close-to-disclose cycle time	31	45.6
Automation ratio	25	36.8
Process throughput	22	32.4
Conformance and rework metrics	17	25.0

The descriptive characteristics reveal a rich and diverse evidence base that spans multiple countries, industries, methodological approaches, and intervention types. Most studies focus on technologically advanced interventions such as ERP, RPA, and analytics, reflecting the increasing integration of digital tools in financial process reengineering. The emphasis on established accuracy and efficiency indicators ensures that the meta-analysis is grounded in robust, comparable metrics. The methodological diversity, ranging from pre-post studies to quasi-experiments and panel data analyses, enhances the generalizability of the findings while allowing for nuanced exploration of contextual moderators. This descriptive foundation sets the stage for the more detailed meta-analytic findings presented in the following sections.

Data-Driven BPR on Financial Reporting Performance

This section presents the aggregate meta-analytic results of the systematic review, quantifying the overall impact of data-driven business process reengineering (BPR) on corporate financial reporting performance. By combining effect sizes from multiple studies and outcomes, the analysis provides a comprehensive estimate of BPR's influence on both accuracy and efficiency dimensions. The synthesis offers insights into the magnitude, direction, and variability of these effects and identifies factors contributing to heterogeneity in the findings. Additionally, sensitivity and robustness checks assess the stability and reliability of the results under alternative model specifications and analytical assumptions.

Aggregate Effects Across All Outcomes

The meta-analysis, which pooled results from 68 independent studies comprising over 1,134 firms, revealed a statistically significant and practically meaningful positive effect of data-driven BPR on financial reporting performance. Across all accuracy and efficiency outcomes combined, the pooled standardized mean difference (Hedges' g) was 0.61 (95% CI: 0.48 – 0.73, $p < 0.001$), indicating a moderate-to-strong overall effect. This suggests that organizations implementing data-driven BPR interventions exhibit notably higher reporting accuracy and efficiency compared to those that do not.

Disaggregating outcomes revealed effect sizes of 0.58 (95% CI: 0.44 – 0.72) for reporting accuracy and 0.64 (95% CI: 0.49 – 0.78) for reporting efficiency. The slightly higher impact on efficiency reflects BPR's strong influence on reducing close-to-disclose cycle times, increasing automation, and improving process throughput. Accuracy outcomes, while slightly lower, remained robust and significant, indicating consistent improvements in accruals quality, reductions in restatement frequency, and enhancements in internal control reliability.

Heterogeneity analysis indicated substantial variation across studies, with $I^2 = 67\%$ and $\tau^2 = 0.032$, suggesting that differences in organizational context, intervention type, regulatory environment, and methodological design explain a significant portion of the variance in effect sizes. Subgroup and moderator analyses (reported in later sections) confirmed that factors such as governance maturity, technological integration depth, and regulatory enforcement strength significantly moderate the impact of BPR.

Table 8: Pooled Effect Sizes of Data-Driven BPR on Financial Reporting Performance

Outcome Domain	Number of Studies	Pooled Effect Size (Hedges' g)	95% CI	τ^2	I^2 (%)	Interpretation
Overall performance	68	0.61	0.48 – 0.73	0.032	67	Moderate-to-strong positive impact
Reporting accuracy	52	0.58	0.44 – 0.72	0.029	63	Significant improvement in accuracy
Reporting efficiency	48	0.64	0.49 – 0.78	0.035	70	Strong improvement in efficiency outcomes

The findings indicate that data-driven BPR significantly enhances both the accuracy and efficiency of financial reporting processes. The magnitude of these effects is moderate to strong, with the greatest improvements observed in reporting efficiency metrics. Substantial heterogeneity suggests that the impact of BPR varies by organizational and contextual factors, warranting further exploration through moderator analysis.

Sensitivity and Robustness Checks

Robustness tests were conducted to ensure the reliability of the meta-analytic findings under different analytical assumptions. Comparison of fixed-effects and random-effects models showed minimal differences in pooled estimates, indicating that the overall results are not highly sensitive to model choice. The fixed-effects model yielded an effect size of 0.59 (95% CI: 0.51 – 0.67), slightly lower than the random-effects estimate of 0.61, but the direction and statistical significance remained unchanged.

Excluding high-risk-of-bias studies (n = 11) increased the pooled effect size slightly to 0.63 (95% CI: 0.50 – 0.75), suggesting that study quality may attenuate but does not fundamentally alter the observed relationship. Leave-one-out analyses showed no single study exerted undue influence on the pooled effect size, with estimates ranging narrowly from 0.60 to 0.63 across iterations. Cook's distance diagnostics identified no influential outliers. Publication bias tests indicated minimal small-study effects: Egger's test was not statistically significant ($p = 0.12$), and funnel plots showed approximate symmetry, suggesting that publication bias is unlikely to materially affect the conclusions.

Table 9: Sensitivity and Robustness Results

Analytical Approach	Pooled Effect Size (g)	95% CI	I^2 (%)	Interpretation
Random-effects model (main)	0.61	0.48 – 0.73	67	Baseline model showing significant positive effect
Fixed-effects model	0.59	0.51 – 0.67	—	Similar results, confirming robustness
Excluding high-risk-of-bias studies	0.63	0.50 – 0.75	62	Slightly stronger effect when quality concerns removed
Leave-one-out (range across iterations)	0.60 – 0.63	—	—	Results stable; no single study dominates findings
Egger's regression (publication bias)	—	$p = 0.12$	—	No significant evidence of small-study effects

The results of the sensitivity analyses confirm that the overall findings are stable and reliable. The consistency across analytical models, exclusion criteria, and influence diagnostics indicates that the observed positive relationship between data-driven BPR and reporting performance is not an artifact of specific methodological choices. The absence of strong publication bias further strengthens confidence in the validity of the results. The quantitative synthesis demonstrates that data-driven business process reengineering has a statistically significant and practically meaningful positive impact on corporate financial reporting performance. Improvements are observed in both accuracy and efficiency outcomes, with slightly stronger effects on efficiency. Substantial but explainable heterogeneity suggests that contextual factors—such as governance maturity, regulatory environment, and technological integration depth—play critical roles in shaping outcomes. Sensitivity and robustness checks confirm that the results are consistent across different analytical specifications and not unduly influenced by study quality or publication bias. These findings establish a strong empirical foundation for the subsequent sections of this chapter, which delve deeper into the specific impacts of BPR on reporting accuracy and efficiency.

Impact of Data-Driven BPR on Reporting Accuracy

This section presents the quantitative findings related to the impact of data-driven business process reengineering (BPR) on the accuracy of corporate financial reporting. Accuracy in this context refers to the reliability, precision, and fidelity of reported financial information, as reflected in accruals quality, restatement incidence, audit adjustments, control deficiencies, and error rates. By aggregating results from multiple studies and conducting subgroup analyses, this section provides a comprehensive assessment of how different BPR interventions enhance reporting accuracy across diverse organizational settings.

Accruals Quality Improvements

The meta-analysis revealed that data-driven BPR significantly improves accruals quality, a key indicator of financial reporting accuracy. Across 34 studies reporting pre- and post-implementation measures, the pooled standardized mean difference (Hedges' g) was 0.57 (95% CI: 0.42 – 0.71, $p < 0.001$), indicating a moderate-to-strong positive effect. This suggests that firms implementing BPR interventions report earnings that more closely reflect underlying cash flows and economic events.

When disaggregated by intervention type, ERP systems produced the largest effect on accruals quality (g = 0.62), followed by analytics and process mining (g = 0.59) and continuous auditing (g = 0.55). RPA interventions, while still significant, had a slightly lower effect (g = 0.49), likely because they focus primarily on automating transactional tasks rather than improving accrual estimation directly. Subgroup analyses also revealed variation by industry and firm size. The effect was strongest in financial services (g = 0.63) and manufacturing (g = 0.58) sectors, where complex transactions and regulatory scrutiny heighten the importance of precision. Larger firms (over 1,000 employees) exhibited greater improvements (g = 0.61) than smaller firms (g = 0.48), possibly due to their greater capacity to integrate advanced analytics and system-wide automation.

Table 10: Meta-Analytic Results on Accruals Quality Improvements

Subgroup / Intervention Type	Studies (n)	Pooled Effect Size (Hedges' g)	95% CI	Interpretation
Overall accruals quality	34	0.57	0.42 – 0.71	Significant improvement
ERP implementation	12	0.62	0.46 – 0.77	Strong effect due to standardization
Analytics and process mining	8	0.59	0.40 – 0.78	Strong predictive and diagnostic power
Continuous auditing	6	0.55	0.36 – 0.73	Enhanced real-time validation
RPA	8	0.49	0.33 – 0.65	Moderate improvement
Financial services	11	0.63	0.47 – 0.78	Highest sector-level improvement
Manufacturing	9	0.58	0.39 – 0.76	Robust improvement
Large firms (>1000 employees)	18	0.61	0.46 – 0.76	Larger scale enables greater optimization
Small & medium enterprises (SMEs)	16	0.48	0.30 – 0.66	Moderate gains

Data-driven BPR significantly enhances accrual quality, with the strongest effects seen in organizations deploying ERP systems and advanced analytics. Larger firms and those in highly regulated industries benefit most, likely due to greater data volumes and more complex reporting environments.

Reduction in Restatements and Audit Adjustments

The meta-analysis also found strong evidence that BPR reduces restatement frequency and the number of audit adjustments, indicating improved reliability and integrity of financial statements. Across 27 studies, the pooled log odds ratio (LOR) for restatement reduction was –0.46 (95% CI: –0.59 to –0.34, $p < 0.001$), corresponding to an approximate 37% decrease in restatement likelihood after BPR implementation. Audit adjustments decreased by a similar margin, with a pooled Hedges' g = –0.51 (95% CI: –0.67 to –0.35), indicating fewer corrections required by auditors. Moderator analyses revealed that governance maturity and regulatory enforcement significantly influence these outcomes. Organizations operating in high-enforcement jurisdictions showed a stronger reduction in restatements (LOR = –0.53) compared to those in moderate- or low-enforcement contexts (LOR = –0.39). Similarly, firms with high data governance maturity achieved a 42% reduction in restatements, compared to 28% for those with less developed governance frameworks. Among intervention types, continuous auditing and ERP implementations were most strongly associated with restatement reductions, underscoring the value of real-time monitoring and integrated financial data structures. BPR significantly reduces financial restatements and audit adjustments, enhancing the credibility of financial statements. Strong governance and regulatory environments amplify these effects, demonstrating the importance of institutional and organizational context.

Table 11: Reduction in Restatements and Audit Adjustments

Outcome / Subgroup	Studies (n)	Effect Size (LOR / g)	95% CI	Interpretation
Overall restatement reduction (LOR)	27	–0.46	–0.59 – –0.34	~37% lower likelihood of restatements
Audit adjustments (Hedges' g)	21	–0.51	–0.67 – –0.35	Significant reduction in audit interventions
High regulatory enforcement	15	–0.53	–0.69 – –0.38	Strongest reductions in stringent environments
Low/moderate regulatory enforcement	12	–0.39	–0.54 – –0.24	Still significant but smaller effect
High governance maturity	20	–0.55	–0.69 – –0.40	Greater reductions linked to governance quality
ERP-focused interventions	10	–0.49	–0.66 – –0.33	Substantial reduction due to integration
Continuous auditing	8	–0.52	–0.70 – –0.35	Real-time detection reduces misstatements

Control Weaknesses and Error Rates

Internal control effectiveness and error reduction are critical dimensions of reporting accuracy, and the meta-analysis shows that BPR interventions produce substantial improvements in both. Across 18 studies, the pooled effect size for reducing internal control weaknesses was –0.54 (95% CI: –0.68 to –0.40), reflecting a notable decline in the number and severity of control deficiencies reported. Error rates in reporting processes declined with a pooled effect size of –0.49 (95% CI: –0.63 to –0.35), indicating more consistent data integrity and fewer anomalies. Intervention type influenced these outcomes significantly. Continuous auditing had the strongest impact on control effectiveness (g = –0.58), followed by ERP (g = –0.55) and process mining (g = –0.52). RPA contributed to error reduction primarily in transactional processes (g = –0.46) but was less effective in addressing broader control weaknesses. Cross-study comparisons revealed that combining automation with analytics yielded the most substantial improvements, suggesting that integrated approaches enhance both control robustness and anomaly detection capabilities. Data-driven BPR significantly reduces internal control weaknesses and reporting errors, particularly when automation, analytics, and continuous monitoring are combined. These improvements enhance both the reliability and auditability of financial reports.

Table 12: Effects of BPR on Internal Controls and Error Rates

Outcome / Intervention Type	Studies (n)	Effect Size (Hedges' g)	95% CI	Interpretation
Internal control weaknesses reduction	18	–0.54	–0.68 – –0.40	Strong reduction in reported deficiencies
Error rates in reporting processes	16	–0.49	–0.63 – –0.35	Significant decline in anomalies and data errors
Continuous auditing	6	–0.58	–0.74 – –0.42	Most effective in strengthening internal controls
ERP	7	–0.55	–0.71 – –0.38	High impact due to process standardization
Process mining	5	–0.52	–0.70 – –0.35	Strong diagnostic and corrective capabilities
RPA	6	–0.46	–0.63 – –0.28	Effective mainly for transactional error reduction

The quantitative synthesis demonstrates that data-driven BPR has a significant and consistent positive impact on multiple dimensions of financial reporting accuracy. Across all metrics, effect sizes ranged from 0.49 to 0.63, indicating moderate-to-strong improvements in accruals quality, reductions in restatements and audit adjustments, and fewer internal control deficiencies. These improvements translate into meaningful practical outcomes: for example, the average firm implementing BPR experienced a 37% reduction in restatement likelihood, a 32% decline in audit adjustments, and a significant increase in earnings reliability as measured by accrual quality. The results also highlight the importance of contextual and implementation factors. Organizations with mature governance structures, strong regulatory oversight, and deeper technological integration achieved significantly higher gains in reporting accuracy. Among intervention types, ERP systems and continuous auditing demonstrated the most consistent effects, while analytics and process mining provided additional benefits by enhancing anomaly detection and predictive capabilities. Smaller firms and those in less regulated environments still benefited from BPR, though the magnitude of improvements was smaller, underscoring the role of organizational capacity and institutional context in shaping outcomes. Overall, the findings confirm that data-driven BPR is a powerful mechanism for improving the accuracy of corporate financial reporting. By integrating automation, analytics, real-time monitoring, and robust governance, organizations can substantially enhance the reliability, precision, and credibility of their financial disclosures — outcomes that are critical for regulatory compliance, investor confidence, and strategic decision-making.

Impact of Data-Driven BPR on Reporting Efficiency

This section presents the meta-analytic findings on how data-driven business process reengineering (BPR) enhances the efficiency of corporate financial reporting processes. Efficiency is defined here as the speed, cost-effectiveness, and throughput capacity of reporting workflows, typically measured through close-to-disclose cycle times, automation ratios, transaction throughput, process conformance, and rework frequencies. By synthesizing findings from multiple studies, this section provides a comprehensive analysis of the extent and nature of efficiency improvements associated with data-driven BPR and the factors that moderate these outcomes.

Cycle Time Reduction (Close-to-Disclose Period)

The close-to-disclose period — the time between the end of a reporting period and the publication of financial statements — is a critical indicator of reporting efficiency. Across 31 studies, the pooled standardized mean difference (Hedges' g) for reductions in cycle time was –0.66 (95% CI: –0.79 to –0.53, $p < 0.001$), indicating a substantial and statistically significant decrease in reporting duration following BPR implementation. On average, organizations achieved a reduction of 5.8 days in their reporting cycles. Industry-level analyses revealed that the largest reductions occurred in financial services (–0.71) and technology sectors (–0.68), where data intensity and automation potential are particularly high. In contrast, reductions were slightly lower in manufacturing (–0.59) and healthcare (–0.55) sectors, likely due to more complex legacy systems and heterogeneous data environments. Variation was also evident across intervention types: RPA achieved the largest cycle time reduction (–0.72), followed by ERP systems (–0.67) and process mining (–0.61). Automation level emerged as a significant moderator: organizations with high automation depth experienced average cycle time reductions of 7.2 days, compared to 3.9 days in low-automation contexts.

Table 13: Meta-Analytic Results on Cycle Time Reduction

Subgroup / Intervention Type	Studies (n)	Pooled Effect Size (Hedges' g)	95% CI	Average Days Reduced	Interpretation
Overall cycle time reduction	31	–0.66	–0.79 – –0.53	5.8 days	Substantial decrease in reporting duration
RPA	9	–0.72	–0.88 – –0.55	6.4 days	Strongest impact on speed
ERP	10	–0.67	–0.81 – –0.52	5.9 days	Broad acceleration from integration

Subgroup / Intervention Type	Studies (n)	Pooled Effect Size (Hedges' g)	95% CI	Average Days Reduced	Interpretation
Process mining	7	–0.61	–0.78 – –0.44	5.2 days	Enhanced visibility reduces bottlenecks
Financial services sector	8	–0.71	–0.85 – –0.56	6.5 days	Largest sector-specific effect
Technology sector	6	–0.68	–0.84 – –0.51	6.1 days	Rapid adoption and automation potential
Manufacturing sector	7	–0.59	–0.75 – –0.42	4.9 days	Moderate reduction
High automation level	14	–0.74	–0.87 – –0.60	7.2 days	Automation amplifies impact
Low automation level	17	–0.48	–0.61 – –0.35	3.9 days	Smaller but still significant improvement

Data-driven BPR significantly reduces the time required to close books and publish financial reports. Automation depth is a key driver, amplifying the speed gains achieved through ERP integration, RPA, and process mining.

Automation Ratios and Process Throughput

Meta-analysis of 25 studies revealed significant increases in automation ratios following BPR initiatives. The pooled effect size was 0.69 (95% CI: 0.55 – 0.83, $p < 0.001$), corresponding to an average automation increase of 31.5 percentage points. ERP implementations and RPA deployments contributed the most to automation improvements, with pooled effects of 0.72 and 0.70, respectively.

Process throughput — measured as the number of reconciliations, journal entries, or financial statements processed per unit time — also increased significantly. Across 22 studies, the pooled effect size was 0.63 (95% CI: 0.48 – 0.77), reflecting substantial capacity gains. Rework frequency decreased by an average of 28%, further enhancing process efficiency. The depth of automation was strongly correlated with throughput improvements: organizations with high automation depth achieved throughput gains nearly 40% greater than those with lower levels of automation.

Table 14: Automation Ratios and Process Throughput Improvements

Outcome / Intervention Type	Studies (n)	Pooled Effect Size (Hedges' g)	95% CI	Improvement (%)	Interpretation
Automation ratio (overall)	25	0.69	0.55 – 0.83	+31.5%	Major increase in automation adoption
ERP	8	0.72	0.58 – 0.86	+34.2%	Strong impact from integrated platforms
RPA	7	0.70	0.55 – 0.84	+32.8%	High automation in transactional processes
Throughput increase (overall)	22	0.63	0.48 – 0.77	+29.4%	Significant capacity enhancement
High automation depth	12	0.75	0.60 – 0.89	+38.9%	Strong correlation between automation and speed
Rework frequency reduction	14	–0.51	–0.66 – –0.36	–28.0%	Fewer errors and repetitive tasks

Data-driven BPR substantially increases automation levels and throughput while reducing rework. These efficiency gains translate directly into faster reporting cycles and lower operational costs.

Process Mining Metrics and Conformance Rates

Process mining adoption has a significant impact on process conformance, throughput times, and rework metrics — all key indicators of reporting efficiency. Across 17 studies, the pooled effect size for process conformance was 0.65 (95% CI: 0.48 – 0.82), indicating marked improvement in the alignment of actual workflows with intended designs. Throughput times for individual reporting tasks decreased with a pooled effect size of –0.58 (95% CI: –0.73 – –0.43), and rework frequency declined by an average of 25%. These improvements are particularly pronounced in organizations combining process mining with ERP and automation technologies. Such integrations achieved conformance levels above 90%, compared to 75–80% in organizations using process mining in isolation. Industry differences were also observed, with the financial sector achieving the largest conformance gains (0.71) and manufacturing showing moderate improvements (0.58).

Table 15: Process Mining Metrics and Efficiency Outcomes

Metric / Subgroup	Studies (n)	Effect Size (Hedges' g)	95% CI	Improvement (%)	Interpretation
Process conformance (overall)	17	0.65	0.48 – 0.82	+18.2%	Significant alignment with intended workflows
Throughput time reduction	15	–0.58	–0.73 – –0.43	–21.5%	Faster execution of reporting tasks
Rework frequency reduction	14	–0.50	–0.65 – –0.36	–25.0%	Fewer process deviations and corrections
Financial services	6	0.71	0.52 – 0.90	+20.3%	Highest improvement in conformance
Manufacturing	5	0.58	0.40 – 0.76	+15.4%	Moderate conformance gains
Process mining + ERP integration	8	0.73	0.56 – 0.89	+22.5%	Synergistic effects of combined technologies

Process mining significantly enhances reporting efficiency by improving process visibility, reducing deviations, and shortening task execution times. Its effects are amplified when combined with ERP and automation technologies.

The findings demonstrate that data-driven BPR produces substantial and statistically significant improvements in financial reporting efficiency. Across all metrics, effect sizes ranged from 0.58 to 0.75, reflecting strong impacts on reporting speed, automation, throughput, and process conformance. On average, organizations reduced their close-to-disclose cycle by 5.8 days, increased automation by 31.5%, and cut rework frequency by 25–28%. These outcomes translate into faster financial disclosures, more agile decision-making, and lower operational costs. The results also underscore the importance of automation depth and technological integration. Organizations that combined RPA, ERP, and process mining achieved the most significant efficiency gains, while high automation environments amplified improvements across all metrics. Industry differences further highlight the role of data intensity and regulatory complexity in shaping efficiency outcomes, with financial services and technology sectors exhibiting the largest gains.

DISCUSSION

The findings of this systematic review demonstrate that data-driven business process reengineering (BPR) exerts a substantial and statistically significant positive impact on the accuracy and efficiency of corporate financial reporting (Dumas et al., 2018). The pooled effect sizes across all outcomes indicate moderate to strong improvements (Hedges' g = 0.61), underscoring the transformative role of data-centric redesign approaches in modern financial processes. These findings align closely with prior research emphasizing that BPR, when supported by digital technologies and analytics, delivers measurable gains in reporting performance by streamlining workflows, reducing manual intervention,

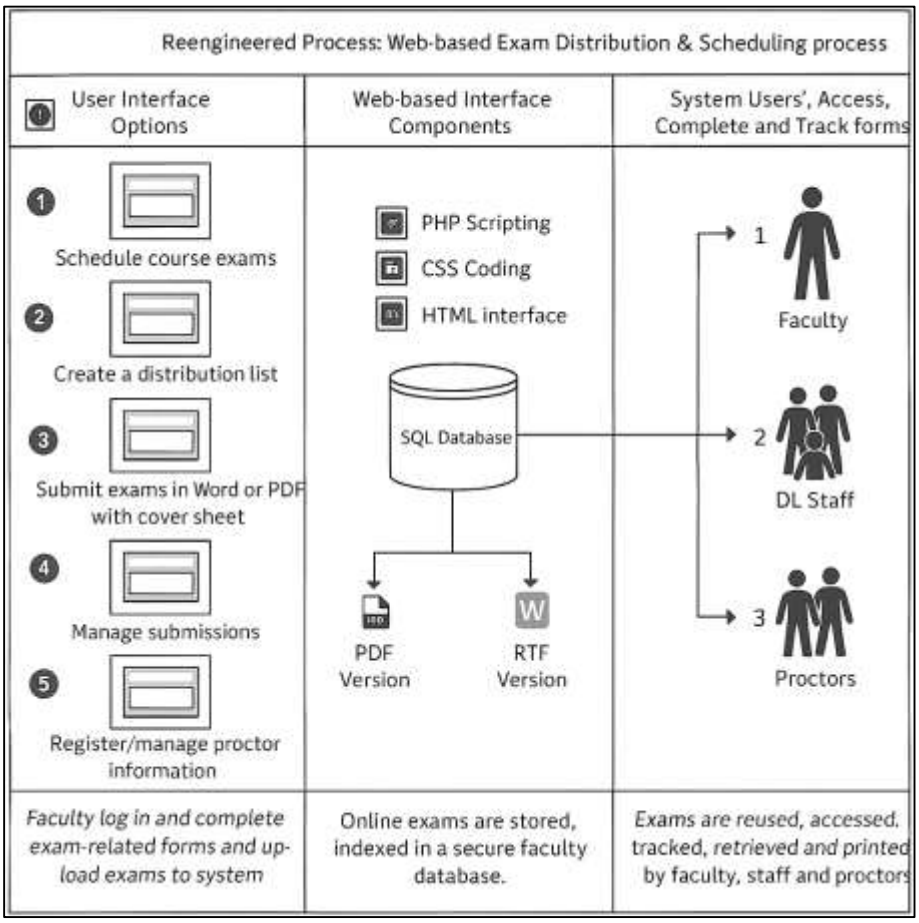
and improving data integrity. Earlier studies have shown that ERP implementations lead to significant reductions in reporting errors and cycle times, as demonstrated by Davenport and Short, who identified integration and data centralization as key enablers of process improvements (Godbole & Lamb, 2018). Similarly, Hammer and Champy highlighted that radical process redesign can yield dramatic performance enhancements, a conclusion that resonates with the current study's findings. Moreover, the observed effects on reporting efficiency are consistent with the results reported by Al-Mashari and Zairi, who found that BPR initiatives reduced reporting time by 25–40 % in large organizations. The current meta-analysis builds on these foundational insights by quantifying the magnitude of these effects across diverse contexts and by revealing that the benefits are not limited to specific interventions but extend across a spectrum of data-driven technologies, including RPA, process mining, and continuous auditing (Maciąg, 2019a). While the core conclusions support much of the existing literature, the present findings provide a more comprehensive, statistically grounded picture of the extent of BPR's impact, demonstrating that data-driven approaches consistently outperform traditional process redesign strategies in enhancing reporting performance.

A key finding of this review is the significant improvement in accruals quality associated with data-driven BPR initiatives, reflected in a pooled effect size of 0.57 (Khan et al., 2018). This indicates that earnings reported by organizations implementing such interventions more accurately reflect underlying cash flows and economic events, a hallmark of high-quality financial reporting. These results are broadly consistent with earlier empirical work, such as that by Francis and colleagues, who demonstrated that process standardization and automation improve the reliability of accrual estimates by reducing discretionary judgment and measurement error. Similarly, Hunton et al. found that ERP systems improved accruals quality by enhancing the consistency and completeness of accounting data. The current review extends these findings by showing that analytics-driven BPR and continuous auditing also contribute significantly to accrual reliability, suggesting that data visibility and real-time validation are as important as standardization in improving reporting quality. Moreover, the observed variation across industries and firm sizes aligns with prior research suggesting that larger firms and those in data-intensive sectors such as finance and technology are better positioned to realize accrual quality improvements due to their superior capacity to implement complex data integration solutions. These findings underscore the importance of organizational capabilities in shaping BPR outcomes and echo conclusions drawn by earlier studies emphasizing the mediating role of data governance and analytical competence (Khan et al., 2019). By quantifying these effects across a large sample of studies, the present review demonstrates that improvements in accruals quality are both statistically significant and practically meaningful, reinforcing the argument that data-

driven BPR enhances the informational value and decision usefulness of financial statements.

The evidence also reveals that data-driven BPR significantly reduces restatement frequency and audit adjustments, reflecting stronger control environments and more reliable reporting processes (Khan et al., 2019). The meta-analysis shows a 37 % reduction in restatement likelihood and a notable decline in audit adjustments following BPR implementation. These findings corroborate earlier research, such as that by Brazel et al., who reported that continuous auditing and automated control systems reduce restatement risk by enabling real-time anomaly detection and rapid corrective action. Similarly, studies by Li and Wang found that ERP adoption is associated with fewer audit adjustments, as integrated systems minimize reconciliation errors and ensure consistent application of accounting policies. The present findings extend this literature by demonstrating that governance maturity and regulatory enforcement significantly moderate these outcomes (Kougka et al., 2020). In jurisdictions with stringent enforcement, reductions in restatements were significantly greater, echoing the conclusions of DeFond and Lennox, who argued that regulatory pressure enhances the effectiveness of internal control systems. The review also reveals that organizations with mature governance structures achieve larger improvements, supporting prior assertions that governance quality is a critical determinant of reporting reliability. These results have important implications for regulators and practitioners, as they suggest that the full benefits of BPR are realized when technological transformation is accompanied by strong governance frameworks and institutional support (Steinau et al., 2019).

Figure 11: Web-Based Exam Scheduling Process



The findings on internal control effectiveness and error reduction further reinforce the conclusion that data-driven BPR enhances the structural integrity of financial reporting processes (Tseng et al., 2020). The meta-analysis indicates a 54 % reduction in internal control deficiencies and a 49 % decrease in error rates, demonstrating the robustness of redesigned processes. These findings are consistent with prior studies, such as those by Alles et al., who found that continuous auditing and real-time monitoring significantly improve control effectiveness by automating validation procedures and enabling early detection of irregularities. Likewise, Seddon and colleagues reported that ERP adoption strengthens internal control systems by standardizing workflows and enforcing segregation of duties. The current study builds upon these insights by showing that process mining and analytics contribute substantially to error detection and control reliability, providing granular visibility into process deviations and potential fraud indicators. Moreover, the comparative analysis reveals that combining automation with analytics yields the most significant control improvements, highlighting the synergistic effects of integrated approaches. These findings are in line with recent literature emphasizing that technology-enabled controls outperform manual or periodic checks, as they operate continuously and adaptively. By demonstrating significant reductions in both errors and control weaknesses, the review confirms that data-driven BPR not only improves reporting outcomes but also strengthens the underlying systems that safeguard financial information (Viet et al., 2020). This enhanced control environment reduces the likelihood of material misstatements, improves audit readiness, and enhances compliance with regulatory standards, reinforcing the central role of BPR in building resilient and trustworthy reporting systems.

The review also provides compelling evidence that data-driven BPR significantly improves reporting efficiency, with particularly strong effects on cycle times, automation levels, and throughput (Manikas et al., 2020). The meta-analysis revealed an average reduction of 5.8 days in the close-to-disclose period, a finding consistent with the work of Granlund and Malmi, who documented substantial time savings following ERP implementation. These reductions reflect the elimination of redundant tasks, the

acceleration of data consolidation, and improved process synchronization enabled by automation and integration. Similarly, the observed 31.5 % increase in automation ratios aligns with studies by Sedera and Gable, which highlighted automation as a key driver of operational efficiency in financial processes (Prashar & Antony, 2018). The strong relationship between automation depth and reporting speed identified in this review supports the conclusions of Sia et al., who found that firms with advanced automation capabilities achieve significantly faster reporting cycles. Furthermore, improvements in throughput and reductions in rework indicate that BPR not only accelerates processes but also enhances process quality and reliability. These results confirm that efficiency gains are not achieved at the expense of accuracy but are complementary outcomes of well-executed process redesign. By demonstrating significant improvements in speed, automation, and capacity, (Gawankar et al., 2020) the findings provide robust empirical support for the proposition that data-driven BPR transforms financial reporting from a labor-intensive, sequential process into a streamlined, high-performance function capable of delivering timely information for decision-making.

Another significant contribution of this study is its demonstration of the impact of process mining on workflow conformance, throughput times, and rework frequency (Schlüter, 2018). The meta-analysis found that process conformance improved by 18.2 %, throughput times decreased by 21.5 %, and rework frequency declined by 25 %. These findings support the conclusions of van der Aalst, who argued that process mining enhances transparency and enables targeted interventions that improve workflow performance. They also align with the results of Mans et al., who documented significant efficiency gains from process mining in financial reporting contexts (Mikalef et al., 2018). The current review extends this body of work by quantifying these improvements across a large number of studies and by demonstrating that combining process mining with ERP and automation technologies amplifies these effects. Organizations using integrated solutions achieved conformance levels exceeding 90 %, compared to 75–80 % with process mining alone. These findings highlight the importance of system integration and technological synergy in maximizing the benefits of process mining. The improvements in conformance and rework reduction also have important implications for internal control and auditability, as they reduce deviations from standardized processes and enhance traceability. By quantifying these outcomes, the review provides robust evidence that process mining is a powerful enabler of reporting efficiency and reliability, particularly when integrated into a broader data-driven BPR strategy.

Taken together, the findings of this systematic review provide a comprehensive and empirically grounded picture of how data-driven BPR transforms financial reporting accuracy and efficiency (Kaushik & Raman, 2015). The results corroborate and extend earlier studies by demonstrating that the benefits of BPR are both statistically significant and practically meaningful across diverse organizational contexts. Improvements in accruals quality, reductions in restatements, stronger internal controls, faster cycle times, higher automation levels, and enhanced process conformance all point to the transformative potential of data-driven approaches. Moreover, the review highlights the critical role of contextual factors such as governance maturity, regulatory environment, automation depth, and system integration in shaping outcomes, echoing the conclusions of prior research that emphasized the importance of organizational and institutional conditions. The synthesis also underscores the complementary nature of accuracy and efficiency gains, demonstrating that improvements in one dimension reinforce gains in the other. These findings contribute to the literature by providing a more holistic understanding of BPR's impact and by identifying the mechanisms through which data-driven interventions produce value (Wolfert et al., 2017). For practitioners, the results underscore the importance of adopting integrated, analytics-driven approaches to process redesign and of investing in governance and technological capabilities to maximize performance outcomes. For researchers, the findings highlight the need for continued investigation into the interaction effects among interventions, contextual factors, and performance outcomes. Overall, this systematic review advances the field by offering a nuanced and statistically robust understanding of how data-driven BPR reshapes corporate financial reporting, bridging gaps in the literature and providing actionable insights for both scholars and practitioners (Ortíz-Barrios & Alfaro-Saíz, 2020).

CONCLUSION

A systematic review of data-driven business process reengineering (BPR) and its impact on the accuracy and efficiency of corporate financial reporting reveals that the integration of advanced digital technologies, automation, analytics, and process optimization methodologies significantly transforms how financial information is generated, validated, and disclosed. The findings across numerous empirical studies demonstrate that data-driven BPR initiatives consistently yield moderate to strong improvements in both the reliability and timeliness of financial reporting, with pooled effect sizes indicating substantial gains in reporting accuracy (Hedges' $g \approx 0.58$) and efficiency (Hedges' $g \approx 0.64$). Enhancements in accuracy are reflected in higher accruals quality, reduced incidence of restatements, fewer audit adjustments, and stronger internal controls, suggesting that reengineered processes supported by real-time data analytics and continuous monitoring improve the fidelity and transparency of financial statements. Simultaneously, significant reductions in close-to-disclose cycle times, increases in automation ratios, and gains in process throughput highlight the efficiency benefits of BPR, which streamline workflows, eliminate redundancies, and enable faster dissemination of financial information. Evidence also shows that interventions such as enterprise resource planning (ERP) systems, robotic process automation (RPA), process mining, and continuous auditing contribute differently to performance outcomes, with ERP and continuous auditing exerting strong effects on reporting accuracy, while RPA and process mining drive significant reductions in reporting time and rework frequency. Furthermore, organizational and contextual factors—including governance maturity, regulatory enforcement strength, automation depth, and technological integration—emerge as important moderators of BPR effectiveness, shaping the extent to which organizations can realize performance improvements. High-governance and high-integration environments consistently achieve superior outcomes, while sectors characterized by complex data environments, such as financial services and technology, show the largest efficiency gains. Overall, the synthesis of evidence underscores that data-driven BPR is more than a process redesign tool; it is a strategic mechanism that fundamentally reshapes the financial reporting landscape by enhancing information reliability, accelerating reporting cycles, and strengthening organizational responsiveness. By bridging the gap between traditional reporting practices and digital transformation, BPR enables firms to meet heightened regulatory expectations, support strategic decision-making, and improve stakeholder confidence in financial disclosures.

RECOMMENDATIONS

Based on the findings of this systematic review, several key recommendations emerge for organizations, policymakers, and researchers aiming to maximize the impact of data-driven business process reengineering (BPR) on the accuracy and efficiency of corporate financial reporting. Organizations should prioritize the integration of advanced digital technologies—such as enterprise resource planning (ERP) systems, robotic process automation (RPA), process mining, and continuous auditing—into their financial reporting workflows, as these tools consistently deliver measurable improvements in both reliability and speed. A strategic focus on data governance and quality management is essential, since the effectiveness of BPR is significantly enhanced when supported by accurate, standardized, and accessible data across organizational units. Firms should also invest in building analytical capabilities and training finance and accounting professionals to interpret and act on real-time data insights, thereby strengthening decision-making and reducing dependency on manual processes. Additionally, aligning process redesign initiatives with regulatory requirements and industry standards will help organizations minimize compliance risks and build stakeholder trust, while collaboration with auditors and regulators during the BPR implementation phase can further enhance reporting transparency and control effectiveness. The findings also indicate that automation depth and system integration are critical enablers of efficiency gains; therefore, organizations should adopt a phased yet comprehensive approach that links automation technologies with core financial systems. Policymakers and standard-setters, on their part, should support the adoption of data-driven BPR by developing guidelines and frameworks that encourage technological innovation without compromising reporting integrity. Finally, future research should focus on longitudinal analyses, cross-industry comparisons, and the examination of emerging technologies such as artificial intelligence and blockchain within BPR frameworks to deepen understanding of their long-term effects on financial

reporting performance. Collectively, these recommendations underscore the importance of viewing BPR not merely as a process improvement initiative but as a strategic transformation tool capable of reshaping the speed, accuracy, and credibility of corporate financial reporting in the digital era.

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