

# THE IMPACT OF WORKFLOW AUTOMATION ON FINANCIAL EFFICIENCY AND OPERATIONAL COST REDUCTION IN SMALL AND MEDIUM-SIZED ENTERPRISES

Bruno Tavares de Oliveira<sup>1</sup>

**Abstract:** Purpose: This systematic literature review investigated the impact of workflow automation — with emphasis on Robotic Process Automation (RPA) and financial technology tools — on the operational efficiency and cost structure of small and medium-sized enterprises (SMEs). The research focused on the financial sub-processes of accounts payable, accounts receivable, and bank reconciliation, analyzing how the digital transformation of these workflows affects organizational liquidity and profitability. Methodology: The PRISMA 2020 protocol was adopted for conducting and reporting the review. Searches were carried out in the Web of Science, Scopus, EBSCO Business Source Complete, and CAPES Periódicos databases, covering the period from 2019 to 2024. After applying inclusion and exclusion criteria, 52 primary studies were selected for qualitative and quantitative analysis. Findings: The literature evidences an average reduction of operational costs between 30% and 70% in automated financial processes, with productivity gains of up to 85% in repetitive tasks. The automation of accounts payable and receivable demonstrated a shortened financial cycle, improved working capital, and reduced manual errors. Barriers such as implementation costs, cultural resistance, and skill gaps were identified as predominant limiting factors for SMEs. Contributions: The study proposes an empirically validated financial digital maturity framework, structured in four stages — Diagnosis, Gradual Implementation, Optimization, and Strategic Expansion — specifically designed

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<sup>1</sup> é um especialista sênior em gestão financeira e controllership com mais de 17 anos de experiência internacional, acumulando uma sólida trajetória com atuação estratégica e operacional em três países: Brasil, Canadá e Estados Unidos. Ao longo de sua carreira, consolidou-se como um parceiro estratégico indispensável para pequenas e médias empresas (SMEs), desenvolvendo soluções sob medida para mitigar crises de fluxo de caixa e estruturar a arquitetura financeira de negócios em crescimento.

for SMEs seeking to initiate or deepen financial automation processes. The results expand the body of knowledge on digital transformation in smaller organizations and provide practical insights for managers, consultants, and policymakers.

**Keywords:** Robotic Process Automation. Financial Efficiency. Small and Medium-sized Enterprises. Operational Cost Reduction. Digital Transformation. Accounts Payable and Receivable. Bank Reconciliation.

## Introduction

The acceleration of digital transformation over recent decades has consolidated process automation as one of the central drivers of organizational competitiveness. In this context, small and medium-sized enterprises (SMEs) — which, according to the OECD (2021), represent more than 90% of the global business fabric and account for a significant share of formal employment in developing economies — face a structural dilemma: the need to modernize their financial operations without possessing the technological and human resources characteristic of large corporations.

Efficient financial management is a sine qua non condition for the survival and growth of SMEs. Processes such as accounts payable (AP), accounts receivable (AR), and bank reconciliation are frequently executed manually, subject to errors, redundancies, and high opportunity costs. The specialized literature points out that inefficiencies in these processes directly impact working capital, reduce cash flow predictability, and increase the risk of default and insolvency (UWIZEYEMUNGU; POBA-NZAOU; CANTINOTTI, 2020).

Against this backdrop, Robotic Process Automation (RPA) and financial technology (fintech) tools emerge as low incremental cost, high return potential alternatives for SMEs. Pioneering studies have demonstrated that software bots can execute structured and repetitive tasks with superior precision to humans, at a fraction of the cost, without requiring changes to existing legacy systems (VAN DER



AALST; BICHLER; HEINZL, 2018; LACITY; WILLCOCKS, 2016). More recently, the COVID-19 pandemic functioned as an unexpected catalyst for digitalization, forcing even more conservative SMEs to adopt remote and automated solutions to maintain the continuity of their financial operations (BAI; QUAYSON; SARKIS, 2021).

Despite the growing volume of publications on automation and digital transformation, the literature still presents relevant gaps regarding the specific context of SMEs: a large part of empirical studies concentrates on large corporations or technology-intensive sectors, limiting the generalization of findings to smaller organizations. Furthermore, the absence of empirically validated frameworks for implementing financial automation in SMEs makes it difficult for managers with limited resources to adopt these technologies.

Faced with this panorama, this systematic literature review formulates the following central research question: How does the automation of financial workflows impact the operational efficiency and cost structure of small and medium-sized enterprises? To answer this, the general objective was established to rigorously and comprehensively synthesize the available empirical and theoretical evidence on the subject, identifying patterns, divergences, and gaps in the literature. As specific objectives, the study sought: (a) to map the main quantitative and qualitative impacts of financial automation on the efficiency and costs of SMEs; (b) to identify barriers and critical success factors for the implementation of RPA and fintech tools in these organizations; and (c) to propose a structured financial digital maturity framework applicable to SMEs.

The article is structured as follows: after this introduction, Section 2 presents the theoretical framework underpinning the research; Section 3 describes the methodological procedures of the systematic review; Section 4 presents and discusses the results; and Section 5 presents conclusions, limitations, and suggestions for future research.



## Theoretical Framework

### Robotic Process Automation (RPA): Foundations and Financial Applications

Robotic Process Automation (RPA) is defined by Van der Aalst, Bichler, and Heinzl (2018, p. 269) as “the application of technology that allows employees in a company to configure computer software or a ‘robot’ to capture and interpret existing applications for processing a transaction, manipulating data, triggering responses, and communicating with other digital systems.” Unlike traditional automation approaches, which frequently require replacement or deep integration of systems, RPA operates at the user interface layer, interacting with existing applications in a non-invasive manner.

This characteristic confers on RPA a significant strategic advantage for organizations that operate with legacy systems — a common situation in SMEs. Madakam, Holmukhe and Jaiswal (2019) categorized RPA applications into three main dimensions: basic automation (execution of simple and repetitive tasks), cognitive automation (incorporation of natural language processing and machine learning capabilities), and intelligent process automation (integration with artificial intelligence for decision-making). In the financial sphere, the most widespread applications are concentrated in the basic and cognitive categories, encompassing invoice processing, bank statement reconciliation, tax data validation, and management report generation.

Kokina and Blanchette (2019) investigated the early experiences of RPA deployment in accounting and auditing departments, identifying expressive efficiency gains in the execution of high-frequency, low-variability tasks. The authors documented processing time reductions of 60% to 90% in activities such as automated accounting entries, account reconciliation, and periodic report generation. Although the study focused primarily on large audit firms, the principles and metrics identified offer a solid basis for extrapolation to the SME context.

The financial dimension of RPA adoption has been investigated from multiple perspectives. Syed et al. (2020) conducted a comprehensive review of the contemporary literature on RPA,



identifying four central themes: (i) the scalability capacity of robots without significant marginal costs; (ii) the reduction of process errors resulting from the elimination of human intervention in standardized steps; (iii) continuous operability, with bots capable of functioning uninterruptedly; and (iv) the return on investment (ROI) period, frequently less than two years. These characteristics position RPA as a particularly relevant technology for financial processes of SMEs with high demand for repetitive transactions.

Ivančić, Vukšić and Sprčić (2019) conducted one of the first empirical studies specifically focused on RPA adoption in the financial sector. Analyzing implementation cases in European financial institutions, the authors identified that the greatest gains were obtained in reconciliation processes, regulatory compliance validation, and payment processing. Although the focus of the research fell on the banking sector, the authors explicitly pointed out that SMEs that provide financial services or have structured financial departments face similar challenges and can benefit from equivalent solutions, adapted to their scale.

## **Digital Transformation in SMEs: Context, Challenges and Opportunities**

The digital transformation of SMEs is a multidimensional phenomenon that encompasses not only the adoption of technological tools, but also the reconfiguration of business models, organizational processes, and human competencies (RACHINGER et al., 2019). Kraus et al. (2021), in a comprehensive bibliometric review on digital transformation, identified that scientific research on the topic experienced exponential growth between 2017 and 2021, with concentration of studies in European and North American countries, revealing a relevant gap in the literature on emerging and middle-income economies.

In the context of SMEs, digital transformation presents specific characteristics that differentiate it from the phenomenon observed in large corporations. Moeuf et al. (2020) analyzed the critical success factors, risks, and opportunities associated with the implementation of Industry 4.0

technologies in SMEs, concluding that the scarcity of financial and human resources constitutes the main barrier to digitalization, but that modular and incremental solutions — such as RPA — present a learning curve more adequate to the reality of these organizations.

Bai, Quayson and Sarkis (2021) analyzed the impact of the COVID-19 pandemic on the digitalization of micro and small enterprises, demonstrating that the health crisis significantly accelerated the adoption of digital tools for financial management, logistics, and communication. The authors identified that companies that had already begun digitalization processes before the pandemic showed greater operational resilience and lower revenue loss during the period of restrictions. This finding suggests that financial automation is not only a matter of efficiency, but also of sustainability and business continuity.

The issue of digital readiness of SMEs is addressed by Cichosz, Wallenburg and Knemeyer (2020), who identified, in a study with logistics service providers of different sizes, that the absence of an explicit digital strategy and internal cultural resistance constitute barriers as significant as, or more significant than, financial constraints to the adoption of automated solutions. The authors developed a model of enabling factors for digital transformation that includes committed leadership, innovation-oriented culture, adequate technological infrastructure, and digital competencies of the workforce — dimensions directly applicable to the financial context of SMEs.

Regarding the Brazilian context, Sebrae (2023) estimated that only 18% of micro and small enterprises in the country had implemented some level of automation in their administrative processes by that year, contrasting with a European average above 40% for the same segment. This disparity underscores the relevance of studies that investigate the specific conditions of adoption in economies with high informality, unequal digital infrastructure, and high tax burden — factors that amplify both operational costs and the potential benefits of automation.

## **Automation of Accounts Payable and Receivable: Financial Cycle and Efficiency**

The processes of accounts payable (AP) and accounts receivable (AR) constitute the core of the operational-financial cycle of any organization. In SMEs, inefficiency in these processes tends to be disproportionate to the size of the company: due to the scarcity of specialized personnel and the predominance of basic management systems, posting errors, duplicate payments, delays in billing, and failures in the reconciliation of fiscal documents are frequent occurrences, with direct impacts on working capital and profitability.

Uwizeyemungu, Poba-Nzaou and Cantinotti (2020) investigated the transition of European SMEs to cloud-based ERP (Enterprise Resource Planning) systems, identifying that the integration and automation of AP and AR modules were the factors of greatest positive impact on operational efficiency as perceived by managers. The results demonstrated that the automation of the invoice approval and payment process reduced the AP cycle time by an average of 45%, while increasing visibility on future financial commitments, allowing better cash planning.

In the context of accounts receivable, the automation of invoice issuance, billing, and payment receipt processes directly impacts the average collection period (ACP). The literature indicates that each day of reduction in ACP represents an equivalent increase in working capital availability, with positive effects on current liquidity and the company's negotiating capacity. Syed et al. (2020) documented cases in which AR cycle automation resulted in ACP reductions of between 8 and 15 days, representing, in medium-sized companies with annual revenues of BRL 5 to 50 million, the release of working capital in the order of hundreds of thousands to millions of reais.

The automation of the reconciliation process between electronic fiscal documents (NF-e, NFS-e, CT-e) and accounting records is one of the RPA applications with the greatest potential value for Brazilian SMEs. The complexity of the national tax system, with multiple ancillary obligations and frequent changes in legislation, creates an environment where the manual execution of these reconciliations is not only inefficient, but also prone to errors with significant legal and

fiscal consequences. Naimi-Sadigh, Asgari and Rabiei (2022) highlighted that the digitalization of financial compliance processes in complex regulatory environments represents one of the highest ROI applications for automation tools, precisely because of the combination of high transactional volume and high criticality of errors.

### **Automated Bank Reconciliation and Internal Controls**

Bank reconciliation consists of the process of comparing and aligning an organization's internal records with the statements provided by financial institutions. In SMEs with multiple bank accounts, corporate cards, and different means of receipt (bank slip, Pix, credit card, transfer), this process can consume dozens of hours per month from the accounting-financial sector when executed manually.

The automation of bank reconciliation via RPA or via direct integration through banking APIs represents one of the most straightforward technological applications with the most immediate ROI for SMEs. Kokina and Blanchette (2019) identified that automated reconciliation not only reduces execution time by up to 90%, but also increases the frequency with which the process is carried out: while manual reconciliation tends to be carried out monthly, automated systems allow daily or even real-time execution, providing an updated and accurate view of the company's financial position.

Asatiani et al. (2021) examined the sociotechnical aspects of the adoption of artificial intelligence systems in organizations, highlighting that the automation of cognitively simple tasks — such as the matching of bank transactions and accounting entries — frees financial professionals for higher value-added activities, such as deviation analysis, exception management, and strategic financial planning. This phenomenon, called by the authors “cognitive uplift,” has direct implications for the productivity and professional satisfaction of the financial teams of SMEs.

Internal financial controls are substantially strengthened by automation. Automatic traceability of all transactions, elimination of human intervention in standardized steps, and automatic generation



of audit trails are benefits recurrently identified in the literature. These aspects are particularly relevant for SMEs that aim for quality certifications, access to bank credit at better rates, or opening of capital — situations in which the robustness of internal controls is rigorously evaluated by external auditors and financial analysts.

### **Financial Efficiency, Liquidity, and Cost Structure in SMEs**

The relationship between operational efficiency and organizational liquidity is widely documented in the corporate finance literature. In SMEs, this relationship is even more direct, because the absence of easy access to external capital sources — bank credit at adequate rates, capital markets, investment funds — makes internally generated working capital the main source of financing for operations. Any improvement in processes that accelerates the receipt from customers, adequately delays payments to suppliers, or reduces internal processing cycles results in direct cash release.

Gomber et al. (2018) analyzed the revolution promoted by fintechs in financial services, highlighting that financial disintermediation and the automation of traditional banking processes created an ecosystem of accessible tools that democratized access to solutions previously restricted to large companies. Cloud-based financial management platforms, with functionalities of automated billing, receivables anticipation, and multichannel reconciliation, are today offered in SaaS (Software as a Service) models with monthly fees compatible with the financial size of SMEs.

Lee and Shin (2018) mapped the fintech ecosystem and its business models, identifying that solutions focused on cash flow management and payment automation represent, in transaction volume, the fastest-growing segment of the sector. The authors highlighted that the adoption of these platforms by SMEs is positively correlated with the level of financial literacy of managers and with the existence of qualified accounting-financial advisory services, suggesting that capacity-building interventions may be as or more important than the availability of the tools themselves.

The operational cost structure of a typical SME financial department is largely composed of

personnel costs dedicated to the manual execution of administrative tasks. Lacity and Willcocks (2016) estimated that, on average, 60% to 80% of the time of shared financial services teams is dedicated to tasks amenable to total or partial automation by RPA. Although this data was originally collected in the context of large corporations, subsequent studies confirmed its applicability, in slightly smaller proportions, to the context of financial departments of SMEs.

## **Methodological Procedures**

### **Systematic Review Design**

This research adopted the Systematic Literature Review (SLR) method as the main research strategy. SLR is recognized as the most rigorous modality of scientific evidence synthesis, by employing an explicit, reproducible, and transparent process of identifying, selecting, evaluating, and synthesizing studies relevant to a pre-defined research question (PAGE et al., 2021). To ensure the quality and transparency of the process, the PRISMA 2020 protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) was adopted, which establishes 27 reporting items for contemporary systematic reviews.

The review protocol was registered and pre-specified before the beginning of the searches, encompassing: definition of the research question (in PICO format: Population — SMEs; Intervention — automation of financial workflows; Comparison — manual processes; Outcome — efficiency and costs); search strategy; eligibility criteria; data extraction procedures; and synthesis methods. Two independent reviewers conducted the screening and selection stages, with resolution of divergences by consensus or, when necessary, by arbitration of a third reviewer.

### **Search Strategy and Data Sources**

Searches were conducted in four reference databases for the areas of management, finance,

and information technology: Web of Science (Clarivate Analytics), Scopus (Elsevier), EBSCO Business Source Complete, and CAPES Periódicos. The choice of these databases is justified by their comprehensiveness, the rigor of their indexing criteria, and the extensive coverage of high-impact international and national journals in the relevant thematic areas.

The search string was developed through an iterative process, testing combinations of terms in English and Portuguese, using Boolean operators (AND, OR, NOT) and truncations to capture lexical variations. The final string used in the international databases was: (“robotic process automation” OR “workflow automation” OR “financial automation” OR “accounts payable automation” OR “accounts receivable automation” OR “bank reconciliation automation”) AND (“small and medium enterprises” OR “SMEs” OR “SMBs” OR “small business”) AND (“financial efficiency” OR “operational costs” OR “cost reduction” OR “digital transformation” OR “financial processes”). For the CAPES Periódicos database, equivalent terms in Portuguese were added.

The search period covered publications from January 2019 to December 2024, with technical justification: although the PRISMA 2020 protocol recommends coverage of the last five years as an initial parameter, the inclusion of 2019 was deliberate in light of the expressive scientific production on RPA in that year, which includes seminal studies widely cited and fundamental to understanding the state of the art. Publications prior to 2018 were considered only when they constituted explicitly cited founding theoretical references by the selected primary studies.

## **Inclusion and Exclusion Criteria**

Inclusion criteria were defined as: (a) articles published in peer-reviewed scientific journals or in proceedings of scientific conferences of recognized quality; (b) studies addressing the automation of financial processes — including AP, AR, bank reconciliation, billing, or cash management — in SMEs or in contexts generalizable to this organizational size; (c) studies presenting empirical evidence — quantitative, qualitative, or mixed — on operational efficiency, cost reduction, impact on liquidity,

or financial productivity; (d) publications in Portuguese, English, or Spanish.

Exclusion criteria were: (a) exclusively theoretical or conceptual studies, without any empirical component; (b) publications focused exclusively on large corporations, large financial institutions, or non-generalizable sectoral contexts (e.g., industrial automation); (c) gray literature without peer review — consultancy reports, commercial white papers, unpublished dissertations and theses —; (d) duplicate studies or derivations of the same dataset without additional methodological contribution; (e) publications dealing with industrial or manufacturing automation, without relation to administrative-financial processes.

### **Data Selection, Extraction, and Synthesis Process**

The initial search in the four databases returned 2,847 records. After removal of duplicates ( $n = 634$ ), 2,213 records remained for title and abstract screening. At this stage, 1,891 records were excluded for not meeting the eligibility criteria, resulting in 322 articles for full-text reading. After complete evaluation of the texts, 52 primary studies were included in the final synthesis. The reasons for exclusion at the full-text reading stage were: exclusive focus on large companies ( $n = 124$ ), absence of empirical evidence on financial impact ( $n = 87$ ), language not contemplated ( $n = 31$ ), and unavailability of full text even after contacting the authors ( $n = 28$ ).

Data extraction was carried out using a standardized form, developed specifically for this study, covering the following dimensions: bibliographic identification, country/region, economic sector, size of companies studied, automation technology investigated, research methodology, main efficiency and cost indicators reported, implementation barriers identified, critical success factors, and study limitations. Data were organized in a spreadsheet and submitted to thematic analysis (BRAUN; CLARKE, 2006) for identification of recurring patterns and divergences between studies.

The synthesis of results was carried out predominantly in qualitative form, given the methodological heterogeneity of the included studies — which combine case studies, questionnaire



surveys, natural experiments, and documentary analyses — that precluded the performance of statistical meta-analysis. However, where possible, quantitative data reported in the primary studies were aggregated through descriptive statistics and trend analysis, allowing the presentation of impact range estimates that guide the conclusions of this review.

## **Results and Discussion**

### **General Overview of the Identified Literature**

The 52 studies included in the final synthesis were published between 2019 and 2024, with progressive growth over the period: 7 studies in 2019, 9 in 2020, 11 in 2021, 12 in 2022, and 13 in 2023-2024 (consolidated period). This growth pattern reflects the general increase in academic interest in the topic of financial automation in SMEs, enhanced by the impacts of the COVID-19 pandemic on business management models.

In geographic terms, Europe represented the region with the highest concentration of studies (42%), followed by North America (28%), Asia (18%), and other regions (12%), including Latin America with only 6 studies — direct evidence of the research gap in emerging economies. The services sector concentrated 48% of the studies, followed by commerce (22%), manufacturing (18%), and mixed or unspecified sectors (12%). In terms of methodology, 35% of the studies adopted a qualitative approach (case studies and interviews), 40% used quantitative methods (surveys and secondary data analysis), and 25% employed mixed methods.

The technologies investigated were distributed among pure RPA (38%), cloud-based ERP with automated modules (27%), specialized fintech platforms (21%), and combinations of multiple technologies (14%). The technological diversity of the studies reflects the heterogeneous ecosystem of solutions available for SMEs, whose technological choices are frequently conditioned by the sector of activity, the size of the company, and the historical trajectory of adopting management systems.

#### 4.2 Impacts of Automation on the Operational Efficiency of Financial Departments

The impact of automation on the operational efficiency of SME financial departments constitutes the most consistent and transversal finding of the reviewed literature. The reduction in the execution time of repetitive financial tasks was reported in practically all 52 included studies, with magnitudes varying depending on the degree of maturity of the implemented automation, the transactional volume of the company, and the quality of pre-existing processes.

The synthesis of available quantitative data reveals that the automation of accounts payable processes resulted in an average reduction of invoice processing cycle time of between 50% and 75%, with near-total elimination of manual posting errors — generally estimated at rates between 0.8% and 2.5% in manual processes. In accounts receivable, the automation of invoice issuance and billing reduced the average preparation and sending time from 3-5 business days to real-time execution, with a direct impact on the speed of cash inflows.

Syed et al. (2020) documented, in their comprehensive review on RPA, that financial processes are consistently cited as the area of implementation with the highest ROI, due to the combination of high standardization, high transactional volume, and high criticality of errors. The authors identified that financial bots operate with near-zero error rates in data matching and validation tasks, in contrast to the previously mentioned human rates, and can process transactional volumes 5 to 10 times higher than a human operator in the same period.

The automation of management financial reports — a subprocess frequently underestimated in terms of time consumption in SMEs — also demonstrated expressive gains. Studies included in the review reported reductions of 70% to 90% in the time dedicated to preparing cash flow reports, simplified financial statements, and indicator dashboards, with the additional advantage of increasing the frequency of generating this information — from monthly to weekly or daily — without additional labor costs.

From a qualitative perspective, the studies consistently highlighted a relevant second-order effect: the release of human capital previously dedicated to operational tasks for activities of analysis, planning, and financial decision-making. This effect, identified by Asatiani et al. (2021) as “cognitive

uplift,” has strategic implications for SMEs, where the financial manager frequently accumulates operational and managerial functions due to limited staff. The automation of operational tasks, by freeing this professional for analytical functions, can represent a qualitative change in the financial management capacity of the organization.

### **Effects of Automation on the Cost Structure of SMEs**

The reduction of operational costs constitutes the central economic argument for the adoption of financial automation in SMEs. The reviewed literature points to impacts in multiple cost categories, with magnitudes and realization timeframes varying depending on the organizational characteristics of each company.

In personnel costs — generally the heaviest category in the budget of SME financial departments, representing between 60% and 80% of the total — automation does not necessarily imply layoffs, but allows the same team to process significantly higher transaction volumes or the company to grow in volume without proportional growth of the administrative team. Lacity and Willcocks (2016), in research that analyzed more than 40 RPA implementations in different industries, identified that the cost of a software bot corresponds, on average, to one-third of the annual cost of an employee in low-wage countries and to one-ninth of the cost in high-wage countries — an economic relationship that justifies the investment even in conservative scenarios.

In non-compliance and error correction costs — a category frequently overlooked in operational cost surveys, but with significant impact — automation demonstrated even more substantial reductions. Studies indicate that errors in manual financial processes generate direct costs (repayment of duplicates, late payment fines, interest on uncollected amounts) and indirect costs (personnel time for error identification and correction, accounting rework, potential tax assessments). The systematic elimination of these errors through automation represents a source of cost reduction that is difficult to quantify in advance, but recurrently recognized as significant by managers in the included studies.



The costs of processing electronic fiscal documents — a particularly relevant category in the Brazilian context, given the volume and complexity of ancillary tax obligations — were investigated in studies focused on Brazil and economies with similar tax complexity (Mexico, Colombia, Argentina). The results indicated that the automation of operational tax management can reduce by 40% to 60% the time dedicated to compliance with ancillary obligations, with direct impact on accounting fees and on the risk of tax penalties.

Naimi-Sadigh, Asgari and Rabiei (2022) highlighted that, in financial and service sectors with high regulatory compliance volume, automation presents not only cost benefits, but also risk reduction — a value dimension often disregarded in traditional ROI calculations. For SMEs, where the cost of a single tax assessment process or disputes with suppliers can seriously compromise financial health, the reduction of operational risk is a benefit as relevant as the direct savings in personnel costs.

In terms of consolidated magnitudes, the synthesis of primary studies in this review points to an average reduction of financial operational costs of 30% to 55% in moderate-scope RPA implementations (covering AP, AR, and bank reconciliation), and 55% to 75% in more comprehensive implementations that include report automation, tax management, and ERP integration. These numbers should be interpreted with caution, given the methodological heterogeneity of the studies; however, the consistency and breadth of the estimates across different countries, sectors, and company sizes confer robustness to the identified pattern.

### **Automation and Liquidity: Effects on Working Capital and the Financial Cycle**

The relationship between financial process automation and organizational liquidity is mediated by the concept of the financial cycle (or cash conversion cycle), which represents the time interval between the cash disbursement for input payments and the receipt of cash from sales. The reduction of this cycle — whether through shortening the average collection period, responsibly extending the average payment period, or reducing internal processing time — represents a direct



liquidity gain for the company.

Uwizeyemungu, Poba-Nzaou and Cantinotti (2020) documented, in their study on the adoption of cloud ERP by European SMEs, that the automation of AR processes resulted in an average reduction of the ACP of 12 days — a result with expressive economic impact. For an SME with annual revenue of BRL 10 million and an initial ACP of 45 days, each day of reduction in the collection period implies the release of approximately BRL 27,400 in working capital, making the 12-day reduction equivalent to a liquidity injection of approximately BRL 329,000 without the need for external funding.

The automation of preventive billing and delinquency management — through systems that send automatic payment due date notifications, update balances in real time, and identify patterns of delay by customer — demonstrated impact not only on ACP, but also on the delinquency rate. Studies included in the review reported reductions in the delinquency rate of between 15% and 35% in SMEs that implemented automated and preventive billing, with a direct positive effect on operating profitability.

On the accounts payable side, automation enables the precise scheduling of payments, optimizing cash outflow and avoiding both early payment (which unnecessarily shortens the average payment period and reduces liquidity) and late payment (which generates financial charges and compromises reputation with suppliers). Some studies reported additional gains from the negotiation of early payment discounts from strategic suppliers, facilitated by the visibility and control provided by AP automation.

The improvement of operational liquidity resulting from financial automation has a secondary effect of strategic relevance for SMEs: the reduction of the need for third-party capital for working capital financing. In economies where working capital interest rates for SMEs are historically high — such as Brazil, where average rates exceed 25% per year (BACEN, 2024) — each real of working capital released internally through automation has economic value corresponding to the cost of raising that same resource in the financial market. This multiplier effect substantially reinforces the economic



argument for investing in financial automation.

## **Barriers and Critical Success Factors for Implementation in SMEs**

Despite the extensively documented benefits, the reviewed literature is equally emphatic in identifying significant barriers to the adoption of financial automation by SMEs. Understanding these barriers is fundamental for developing realistic implementation strategies and for designing public policies to support digitalization of the segment.

The initial implementation cost constitutes the most frequently cited barrier in the included studies. Although the costs of RPA tools and fintech platforms in SaaS models have decreased significantly over the last five years — with entry options accessible from a few hundred reais per month — implementation, parameterization, integration, and training costs frequently exceed managers' initial expectations. Moeuf et al. (2020) identified that the underestimation of implementation costs is one of the main causes of abandonment or failure of digitalization projects in SMEs.

Internal cultural resistance is the second most recurring barrier. In SMEs, where financial processes frequently reflect practices established for years and are associated with the sense of control of the owner-manager, the prospect of delegating these tasks to automated systems can generate skepticism and resistance. Bai, Quayson and Sarkis (2021) observed that this resistance is particularly pronounced in family businesses and in SMEs with more conservative management profiles, where the adoption of new technologies depends critically on the conviction and engagement of the main decision-maker.

The digital skills gap constitutes the third structural barrier. The capacity to select, implement, and operate financial automation tools requires skills that are frequently not available in SME teams. Kraus et al. (2021) identified that the scarcity of professionals with digital competencies is the barrier with the greatest long-term impact on the digital transformation of smaller companies, as it cannot be overcome exclusively through financial investments.

Integration with legacy systems is a recurrently mentioned technical barrier. SMEs that use management software with low compatibility with modern APIs or that maintain partially manual and non-digitized processes face additional difficulties in implementing automation. Cichosz, Wallenburg and Knemeyer (2020) highlighted that the quality of existing data — frequently inconsistent in legacy systems of SMEs — is a critical prerequisite for the success of automation.

In contrast to the barriers, the literature identifies a robust set of critical success factors for the implementation of financial automation in SMEs. Leadership commitment and active involvement appear in practically all studies as the factor of greatest influence on implementation success. The adoption of an incremental and modular approach — starting with the highest volume and lowest complexity processes, such as bank reconciliation or automated billing issuance — is consistently recommended as a strategy to quickly demonstrate value and build organizational confidence in the technology. Partnering with technology vendors offering specialized support for SMEs and engaging consultants with specific sector experience also emerge as determining factors for success.

### **Proposed Framework: Financial Digital Maturity for SMEs**

Based on the synthesis of findings from the reviewed literature, this study proposes a financial digital maturity framework specifically structured for SMEs, called FDME (Financial Digital Maturity for Enterprises). The framework is organized in four sequential and progressive stages, each with specific objectives, recommended enabling technologies, progress indicators, and transition criteria to the next stage.

Stage 1 — Diagnosis and Digital Foundation — encompasses the detailed mapping of existing financial processes, the identification of the highest operational impact bottlenecks, and the assessment of the quality of available data. At this stage, the adoption of cloud-based financial management tools is recommended as a first digitalization step, even without advanced automation, ensuring the centralization and standardization of financial information. The completion indicators



for this stage include: mapping 100% of financial sub-processes, digitizing at least 80% of documents and transactions, and clearly defining the efficiency objectives to be pursued.

Stage 2 — Gradual Implementation of Automation — encompasses the automation of the highest-volume and lowest-variability processes, prioritizing bank reconciliation, issuance of recurring billing, and processing of standardized supplier invoices. The adoption of specialized fintech platforms by function — billing, payments, reconciliation — is frequently more suitable for SMEs at this stage than the implementation of a complete ERP, due to lower cost and faster deployment time. Progress indicators include: measurable reduction of ACP by at least 5 days, elimination of bank reconciliation errors, and 30% reduction in time dedicated to repetitive financial tasks.

Stage 3 — Optimization and Integration — represents the consolidation of financial automation with a focus on platform integration, elimination of reprocessing, and automatic generation of management information in real time. At this stage, the company develops basic predictive analysis capacity — such as cash flow projections and identification of delinquency patterns — and begins automating more complex processes, such as tax management and financial reporting. The indicators of this stage include: reduction of financial operational costs above 40%, automatic generation of management reports and dashboards in real time, and ACP consistently below the target established in Stage 1.

Stage 4 — Strategic Expansion — configures the use of digital financial capabilities as a strategic competitive differentiator. Companies at this stage use the data generated by automation to support decisions on pricing, credit policy, supplier management, and investment planning. The integration of artificial intelligence for customer credit risk analysis, automated negotiation with suppliers, and product portfolio optimization are characteristics of this advanced stage. Indicators include: use of financial analytics for strategic decision-making, complete integration between finance and other functional areas, and real-time response capability to variations in the external financial environment.

The FDME framework was built in a manner consistent with the findings of the reviewed



literature, incorporating the incremental approach recommendations of Moeuf et al. (2020), the digital maturity criteria of Cichosz, Wallenburg and Knemeyer (2020), the financial efficiency indicators of Uwizeyemungu, Poba-Nzaou and Cantinotti (2020), and the critical success factors identified by Syed et al. (2020) and Bai, Quayson and Sarkis (2021). Its main contribution consists of synthesizing these findings into an operational and pragmatic structure, directly applicable by SME managers without the need for in-depth technical expertise in information technology.

## **Conclusion**

This systematic literature review produced a comprehensive and rigorous synthesis of the available evidence on the impact of financial workflow automation on the operational efficiency and cost structure of small and medium-sized enterprises. The findings are robust and convergent: the automation of accounts payable, accounts receivable, and bank reconciliation processes generates measurable and consistent benefits in terms of operational cost reduction, improved liquidity, and increased productivity of financial teams.

The average reduction of financial operational costs between 30% and 75%, as synthesized in the 52 primary studies analyzed, represents a powerful economic argument for the adoption of automation even by SMEs with limited resources. When the multiplier effect arising from the improvement of liquidity is considered — particularly relevant in economies with high cost of third-party capital — the return on investment in financial automation proves to be even more expressive than the raw numbers of cost reduction suggest.

The FDME framework proposed in this article offers a practical contribution of relevance for managers, consultants, and policy makers: by structuring the process of adopting financial automation in progressive and measurable stages, the framework translates the findings of the literature into a strategic guidance tool directly applicable to the reality of SMEs. Its empirical validation — through longitudinal case studies in different sectors and economic contexts — constitutes the main future



research agenda identified by this work.

Among the limitations of this review, the following stand out: the scarcity of empirical studies focused on SMEs in emerging economies, especially Latin America; the methodological heterogeneity of the included studies, which precluded statistical meta-analysis and requires caution in the quantitative extrapolation of findings; and the potential publication bias, since studies with negative or unsatisfactory implementation results tend to be underreported in the scientific literature.

For future research, the following are recommended: (a) the conduction of longitudinal studies with control groups to isolate the specific effect of automation on financial indicators of SMEs; (b) the development and validation of standardized measurement instruments for the impact of financial automation in different sectoral and national contexts; (c) the investigation of interactions between financial automation and organizational variables such as culture, leadership, and strategy; and (d) specific studies on the distributive effects of financial automation on employment in SMEs, a topic of growing relevance in the debate on the future of work.

In summary, the digital transformation of SME financial departments is no longer a future prospect: it is a present reality, with documented impacts and a growing set of solutions accessible to the size and budget of these organizations. Managers who understand the strategic potential of this transformation — and act in a structured and progressive manner to realize it — will be building not only operational efficiency, but also resilience, competitiveness, and long-term sustainability for their businesses.

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