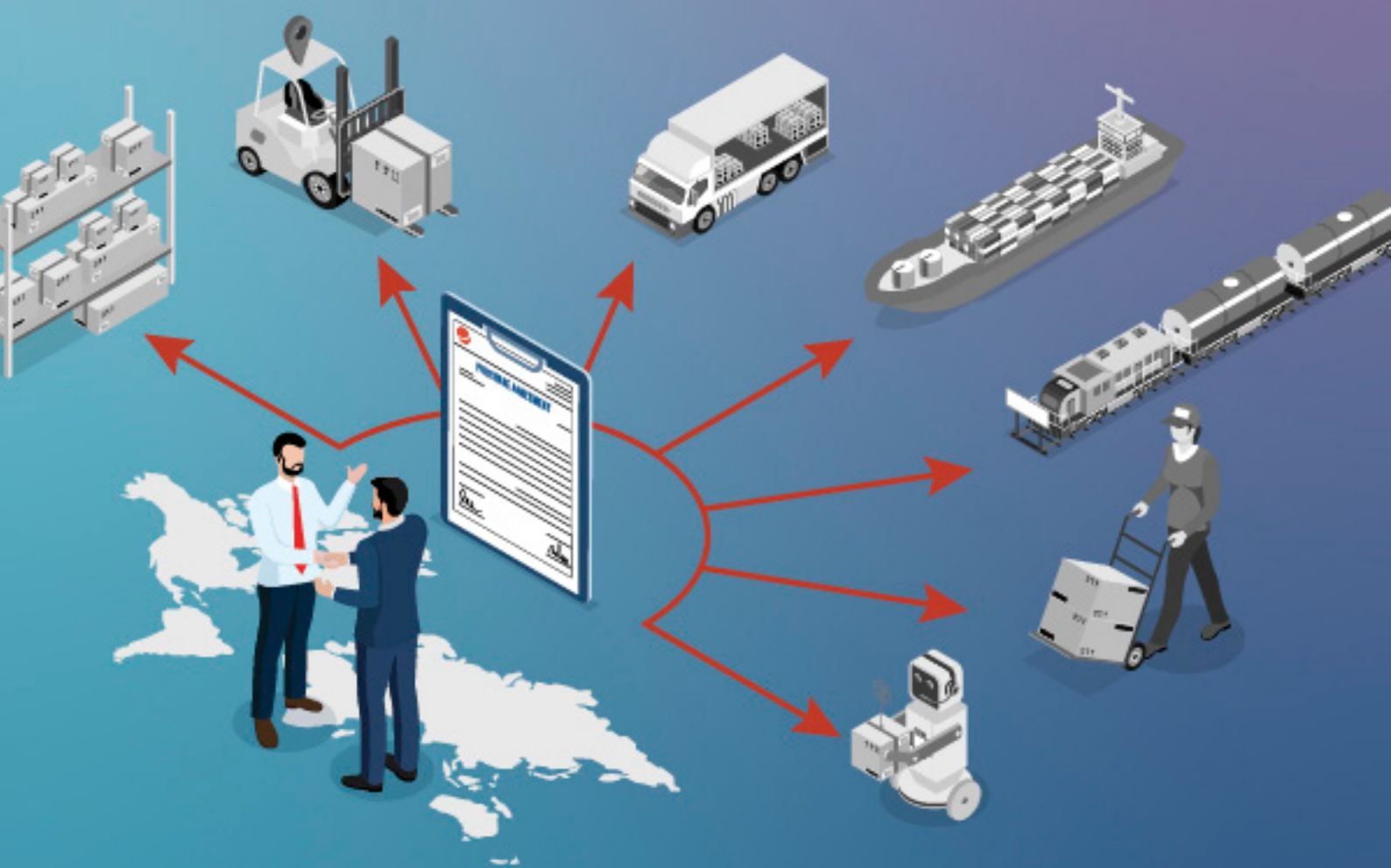




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Designing an Integrated Supply Chain Finance Framework in SAP with Fintech Integration

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ABSTRACT

This paper presents a comprehensive framework to transform vendor payment processes by embedding Supply Chain Finance (SCF) as a strategic payment mechanism. The proposed solution focuses on implementing Supply Chain Finance functionality within SAP and seamless integration between SAP and external Fintech platforms supporting Supply Chain Finance. The design is tailored to the specific operational and strategic requirements of Alfanar, enabling connectivity with one or multiple Fintech solutions facilitating interactions with financial institutions to optimize working capital. Leveraging automated workflows, real-time notifications, and advanced reporting capabilities, the framework enhances financial management, operational efficiency, and supports scalable business growth in a controlled, auditable environment.

INTRODUCTION

Modern enterprises increasingly adopt Supply Chain Finance to optimize liquidity management and strengthen collaboration across supply chain participants. Supply Chain Finance aligns financial flows with physical and informational processes, enabling suppliers to access early payments while allowing buyers to extend payment terms, thereby enhancing overall working capital efficiency.

Despite its strategic value, conventional ERP systems—including SAP—do not natively provide end-to-end Supply Chain Finance functionality. Consequently, organizations often rely on fragmented processes, manual interventions, and multiple reconciliations, which can introduce inefficiencies, reduce transparency, and increase operational risk.

Recent research underscores the transformative role of digital ecosystems and Fintech solutions in overcoming these limitations. By enabling real-time data exchange, process automation, and improved coordination between buyers, suppliers, and financial institutions, Fintech solutions fundamentally reshape Supply Chain Finance implementation. Within this context, this paper proposes a bespoke Supply Chain Finance framework embedded in SAP and integrated with external Fintech platforms. The framework emphasizes automation, API-driven interoperability, structured governance, and real-time monitoring to enhance operational efficiency and decision-making while mitigating financial and operational risks.

LITERATURE REVIEW

Supply Chain Finance has been widely recognized for its ability to optimize liquidity and working capital in supply networks. Prior studies demonstrate Supply Chain

Finance's capacity to improve supplier cash flow and allow buyers to manage payment cycles more efficiently (Klapper *et al.*, 2012; Hofmann, 2005).

A persistent challenge, however, lies in integrating Supply Chain Finance into traditional ERP systems. Conventional platforms often lack native Supply Chain Finance modules, leading to fragmented processes, manual intervention, and limited visibility. Furthermore, the absence of standardized interfaces between ERP systems and external financial platforms impedes efficient data flow and coordinated execution.

Recent research indicates that digital integration, particularly through APIs and middleware, can bridge these gaps. Such integration enables real-time information exchange, standardized workflow orchestration, and enhanced traceability of financial transactions (Gelsomino *et al.*, 2016; Ioannou & Demirel, 2022). This paper contributes to the literature by proposing a structured Supply Chain Finance framework that integrates SAP with Fintech platforms, leveraging automation, standardized interfaces, and workflow-driven controls to enable scalable and cohesive financial processes.

MATERIALS AND METHODS

A design science research (DSR) approach was employed to develop and validate the Supply Chain Finance framework. The methodology comprised four stages:

1. Requirement Elicitation: Detailed consultations with key stakeholders in Accounts Payable, Treasury, and Procurement captured functional and operational requirements.

2. Conceptual Architecture: Based on requirements, a solution architecture aligned with SAP best practices was defined, including data structures, automation routines,

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and workflow mechanisms.

3. System Design and Implementation: Supply Chain Finance processes were configured in SAP, supported by custom tables, batch programs, and workflow automation. SAP Cloud Platform Integration (CPI) was utilized to enable secure API-based connectivity with Fintech partners.

4. Testing and Iterative Refinement: Multi-tiered testing—including unit, integration, and business validation – ensured data accuracy, process reliability, and compliance with financial controls. Iterative adjustments were applied based on feedback to enhance usability and performance. This structured methodology ensured the creation of

a robust, scalable, and technically aligned Supply Chain Finance framework.

Architecture

The framework is designed to support multi-currency invoices, flexible financing options, and real-time monitoring. Centralized data repositories capture Supply Chain Finance -relevant invoices, vendor details, payment terms, and other critical attributes. Automated workflows govern invoice selection, approval, and submission, ensuring compliance, traceability, and operational efficiency.

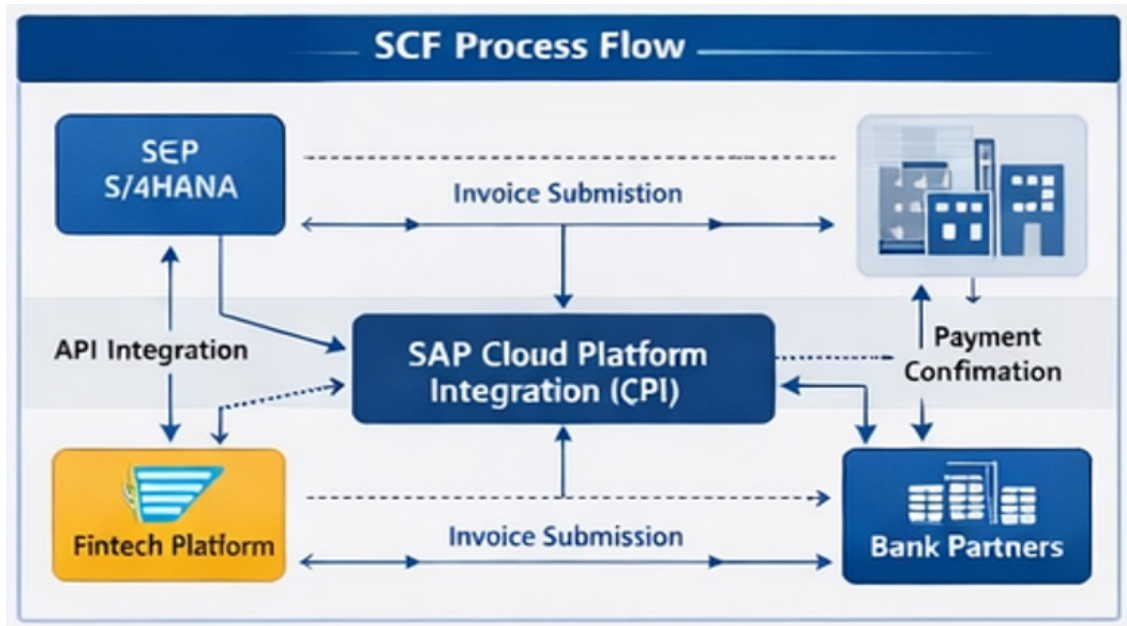


Figure 1: Technical Process Framework

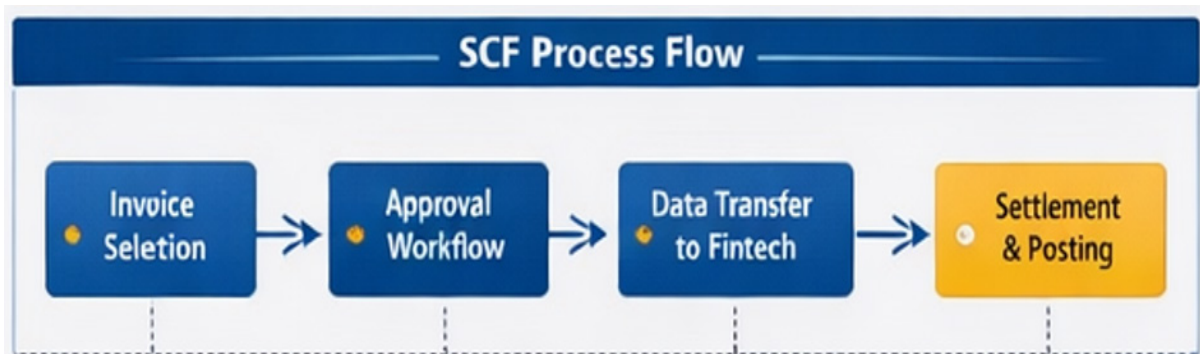


Figure 2: Operational Process Framework

Implementation Approach

The Supply Chain Finance framework enhances coordination between Accounts Payable (AP) and Central Treasury (CT) functions. Key design elements include:

- **Data Repository:** Custom SAP tables store Supply Chain Finance – specific invoice data, updated dynamically via batch programs.
- **Invoice Selection:** Procurement users can select eligible invoices for financing, choosing between traditional banks or Fintech platforms.
- **Automated Documentation:** Supply Chain Finance

requests, summaries, and formal communication letters are generated automatically, routed for approval with electronic signature support.

• **Treasury Processing:** Treasury records payment confirmations, allocates charges, and triggers automated accounting postings, including partial and full payments, financing costs, and liability recognition.

• **Integration with Fintech:** Outbound APIs transmit invoice data, while acknowledgment messages from Fintech confirm processing and bank details. Validation routines prevent duplicates, and exception handling

ensures rejected transactions are addressed.

- **Governance and Reporting:** Configurable vendor eligibility and role-based access controls enforce compliance. Real-time dashboards provide transaction visibility, payment status, and performance monitoring.

- **Future Scalability:** The system supports integration with multiple Fintech providers with minimal customization, ensuring adaptability to evolving business requirements.

The solution integrates with SAP payment programs and can also be integrated with SAP Bank Communication Management (BCM), enabling both manual and automated settlements. It accommodates diverse financing scenarios while maintaining full traceability and auditability.

Integration with Fintech Platforms

APIs facilitate secure, standardized data exchange between SAP and Fintech systems. Invoice data may be transmitted individually or in batch format. Fintech acknowledgments include invoice references, financing banks, and bank accounts. Missing information is sourced from internal configurations. All acknowledgment data is stored in SAP for reconciliation and monitoring, ensuring financial accuracy and enhanced decision-making.

Approval Workflow

A configurable approval workflow ensures structured oversight. Each Company Code, Vendor, and Supply Chain Finance scenario combination is mapped to designated approvers. During transaction processing, the system automatically triggers the appropriate workflow, providing a clear audit trail and ensuring compliance with corporate policies.

RESULTS AND DISCUSSION

System Implementation Outcomes

The implementation of the integrated Supply Chain Finance (SCF) framework within SAP, coupled with Fintech platform integration, resulted in a fully automated end-to-end vendor financing process. The solution successfully eliminated manual intervention in invoice selection, financing initiation, and payment reconciliation. A key outcome of the implemented system is the centralization of SCF-relevant financial data within SAP, enabling real-time visibility of invoice eligibility, financing status, and payment execution. Compared to the previous fragmented process, where data was distributed across spreadsheets and email-based approvals, the proposed framework significantly improved process transparency and reduced processing delays.

The integration with SAP Cloud Platform Integration (CPI) enabled secure API-based communication with external Fintech partners. This resulted in near real-time transmission of invoice data and acknowledgment of financing decisions, reducing communication latency from hours/days to near instant updates.

In addition, automated workflow configuration ensured that invoice approvals followed predefined organizational

hierarchies based on Company Code, vendor category, and financing type. This reduced approval bottlenecks and ensured compliance with internal financial governance policies.

Performance Evaluation and Business Impact

The implemented SCF framework demonstrated measurable improvements across operational and financial performance dimensions.

Working Capital Optimization

The solution enabled buyers to extend payment terms while allowing suppliers to receive early payments through Fintech financing partners. This dual benefit improved liquidity positioning for both parties, consistent with prior findings by Hofmann and Belin (2011). Treasury operations reported improved cash forecasting accuracy due to real-time visibility of financing obligations.

Process Efficiency

Automation of invoice selection, financing requests, and accounting postings reduced manual workload in Accounts Payable and Treasury functions. The elimination of repetitive reconciliation tasks resulted in a substantial reduction in processing time per invoice cycle.

Data Accuracy and Risk Reduction

The use of structured SAP tables and validation rules significantly minimized data duplication and entry errors. Duplicate invoice submissions were automatically blocked through system-level controls, reducing operational risk and improving financial data integrity.

Supplier Relationship Enhancement

Suppliers benefited from faster access to liquidity through optional early payment mechanisms. This improved supplier trust and strengthened long-term procurement relationships, particularly in high-volume vendor categories.

System Scalability and Flexibility

The architecture supports integration with multiple Fintech providers without requiring structural redesign. This modular design ensures scalability and adaptability as financial ecosystems evolve.

Comparative Quantitative Evidence

These outcomes are consistent with recent empirical evidence on Fintech-enabled supply chain performance. Using annual time-series data and an Autoregressive Distributed Lag (ARDL) approach for the Nigerian logistics sector, Akanbi and Emmanuel (2025) found that Fintech adoption and accounting efficiency each exert a statistically significant positive long-run effect on supply chain performance, with estimated coefficients of 0.42 and 0.35 respectively, and an error-correction adjustment speed of approximately 45 percent toward equilibrium following short-run disturbances. This

pattern parallels the present framework's results, in which automation and real-time Fintech connectivity produced compounding, rather than one-off, gains in processing speed and financial visibility: near-instant acknowledgment cycles replaced multi-day manual reconciliation, and approval bottlenecks were reduced through hierarchy-based workflow automation. Similarly, Qian and Arkadievna (2024) highlight that structured, data-driven risk-management practices are essential to preserving supply chain stability under volatile trade and financing conditions, reinforcing the value of the governance controls, duplicate-validation routines, and exception-handling mechanisms embedded within the proposed SAP-Fintech architecture. Taken together, this comparative evidence indicates that the framework's qualitative process improvements are consistent with quantitatively validated relationships reported elsewhere in the Fintech-supply chain literature.

Discussion

The results confirm that embedding Supply Chain Finance functionality within SAP, combined with Fintech integration, creates a robust digital financial ecosystem that aligns operational execution with strategic liquidity management.

Unlike traditional ERP-based finance processes, which are often linear and manually controlled, the proposed framework introduces a networked financial model where SAP acts as the orchestration hub and Fintech platforms act as liquidity enablers. This aligns with the digital finance transformation trends highlighted in Gelsomino *et al.* (2016), particularly the shift toward API-driven financial ecosystems.

Furthermore, the findings reinforce the argument that Supply Chain Finance is no longer solely a financing mechanism but a strategic enabler of supply chain resilience and efficiency. The integration of automation, real-time data exchange, and governance controls reduces financial friction while enhancing decision-making speed and accuracy.

However, the system's effectiveness depends heavily on the quality of integration between SAP and external Fintech platforms. Any latency or mismatch in API communication may affect real-time visibility. Therefore, continuous monitoring and API governance are critical for sustaining performance.

Overall, the framework demonstrates that digital Supply Chain Finance, when embedded within ERP systems and extended through Fintech ecosystems, significantly improves financial agility, operational efficiency, and supply chain collaboration.

CONCLUSION

This study demonstrates that integrating a Supply Chain Finance framework within SAP and connecting it to Fintech platforms provides a robust, scalable solution for vendor payment optimization. By addressing ERP limitations through automation, standardized data

structures, and real-time integration, the framework enhances liquidity for suppliers, strengthens buyer-supplier relationships, and improves working capital efficiency.

Embedded approval workflows and governance mechanisms ensure accountability and mitigate operational risks. Multi-currency support, partial and full financing scenarios, and configurable financing partner selection provide flexibility for evolving enterprise requirements.

Overall, the solution aligns treasury and procurement operations with strategic objectives, consolidates financial control, and promotes sustainable vendor engagement. The framework establishes a replicable, forward-looking model for technology-driven Supply Chain Finance implementation, advancing financial governance, operational efficiency, and supply chain resilience (Pfohl & Gomm, 2009; Hofmann & Belin, 2011).

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