AUTOMATION OF CONTRACT-PAYMENT ACCOUNTING THROUGH A BILLING-INTEGRATION ARCHITECTURE AND ACCOUNTS-RECEIVABLE MANAGEMENT WITH A PAYMENT SCORE MECHANISM AT INDUSTRIAL ENTERPRISES

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Abstract

The article studies the automation of contract-payment accounting and accounts-receivable management at industrial enterprises using the case of «O'zbekko'mir» JSC. In the current process, electronic contracts are issued via the Didox platform, but payment data are entered into the 1C accounting system manually, while the collection process has a broken feedback loop based on prior-day (T-1) data. Two interconnected solutions are proposed: a billing-integration architecture that unifies contracts and payments in a single database through a Contract_id key, and a prevention-collection mechanism based on an integral Payment Score (Risk Score and Trust Score). The approach focuses on preventing debt rather than collecting it and reinforces every action with legally binding electronic documents.

Keywords: billing integration, Contract_id, 1C, Didox, electronic document flow, accounts receivable, Payment Score, Risk Score, Trust Score, credit policy matrix, prevention-collection mechanism.

JEL classification: G32, M15, M41, O33

1. Introduction

The digital transformation of financial processes has become a priority for industrial enterprises worldwide. Industry accounts for about 17.5% of world GDP, and global industrial output reached USD 16.18 trillion in 2023. In Uzbekistan, industry remains a pillar of macroeconomic growth: in 2023 it contributed 26.1% of GDP, with 655.8 trillion soum of output and 69.4 thousand operating enterprises. National policy — the «Digital Uzbekistan – 2030» strategy (Decree PF-6079, 2020) and 2024 measures on adopting ERP systems in industry — has turned the digitalization of contract, payment and accounting processes into a state-level task. The strongest gains from digitalization appear

precisely in automating repetitive, labor-intensive processes such as contract-payment accounting and accounts-receivable (AR) management. Overdue receivables freeze working capital, reduce liquidity and weaken financial discipline, which makes this topic highly relevant in both scientific and practical terms.

In practice, however, financial data at most enterprises arrive from three separate sources — the e-contract platform (Didox), bank channels and the commodity exchange (UzEx) — and merging them into a single accounting loop still relies on manual labor. This causes two systemic problems: contract and payment data are entered into the 1C accounting system by hand, which creates dependence on the human factor, technical errors and the inability to assess the financial position in real time; and AR is managed subjectively and reactively, that is, only after debt has already arisen. The **aim** of this article is to develop, using the case of «O'zbekko'mir» JSC, a billing-integration architecture that automates contract-payment accounting and a Payment Score-based prevention-collection mechanism for AR management. The study compares the current (AS-IS) and target (TO-BE) processes and draws on credit-risk management principles and integration modeling.

2. The current process and its limitations (AS-IS)

Electronic contracts are issued through Didox, but contract details and bank payment data are entered into 1C manually. As a result, the process is error-prone, the financial position cannot be assessed in real time, and contract-payment reconciliation becomes complex and labor-intensive. In AR collection, every step — from compiling the debtor list to recording the outcome — is performed by hand. The key weakness is a broken feedback loop: collection results are not returned to 1C automatically, so the daily debtor list is based on prior-day (T-1) data. Moreover, there is no single quantitative criterion for ranking customers, so decisions remain subjective, and the process does not scale: a growing workload requires hiring additional staff.

3. Billing-integration architecture (TO-BE)

To eliminate these shortcomings, a billing-integration architecture is proposed (Fig. 1). The **billing system** acts as the central hub, consolidating transactions from Didox, payment systems and bank channels into a single flow that is stored centrally in a **PostgreSQL** database, ensuring data integrity and consistency.

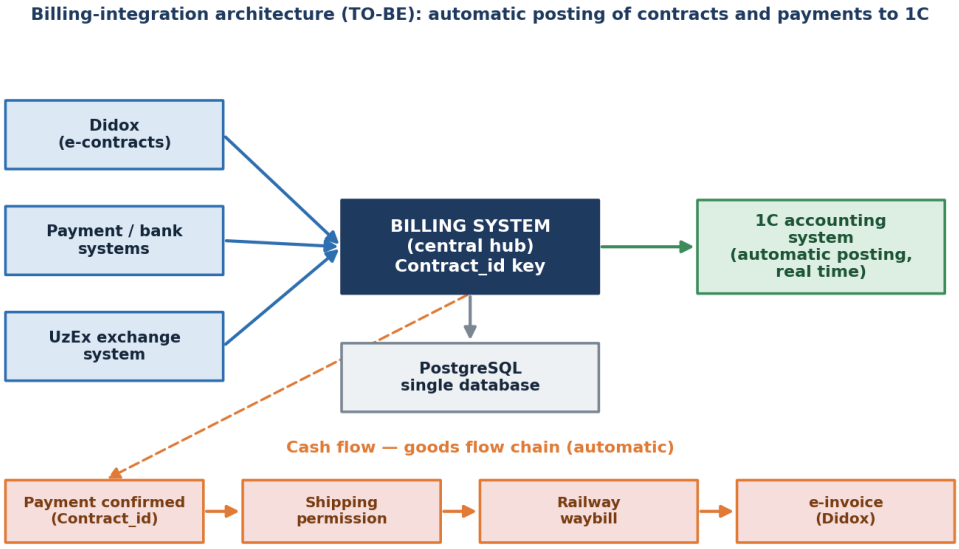

Fig. 1. Automatic posting of contracts and payments to 1C via billing (TO-BE)

The core of the architecture is the **Contract_id** key. It links each contract with its payments and reconciles them automatically, so the required entries are posted to 1C without manual intervention. This enables real-time financial reporting, prompt managerial decisions and a complete, transparent audit trail (log). A further feature is the link between **cash flow and goods flow**: once a payment is confirmed by Contract_id, the system automatically grants shipping permission, issues the railway waybill and sends the e-invoice through Didox. Billing thus turns from a simple accounting tool into an operational mechanism that governs the enterprise's cash-and-goods turnover. Table 1 compares manual entry with billing-based automation.

Table 1. Manual entry versus billing-based automation

Criterion	Manual entry	Billing-based automation
Error probability	High	Very low
Speed	Slow	Very fast
Real-time mode	No	Yes
Audit and control	Difficult	Easy
Scalability	Poor	Very good
Initial cost	Low	High
Long-term efficiency	Low	Very high

4. Payment Score-based prevention-collection mechanism

To improve AR management, a mechanism based on credit-risk management principles is proposed (Fig. 2). Its core is the **Payment Score** — an integral rating generated automatically from billing transactions. **Risk Score** reflects a counterparty's days of delay, the share of overdue amounts and the frequency of discipline breaches; **Trust Score** reflects payment history, the length of cooperation and the use of the exchange-clearing mechanism. The score is recalculated after every payment event, so it is always up to date. The mechanism operates in two loops.

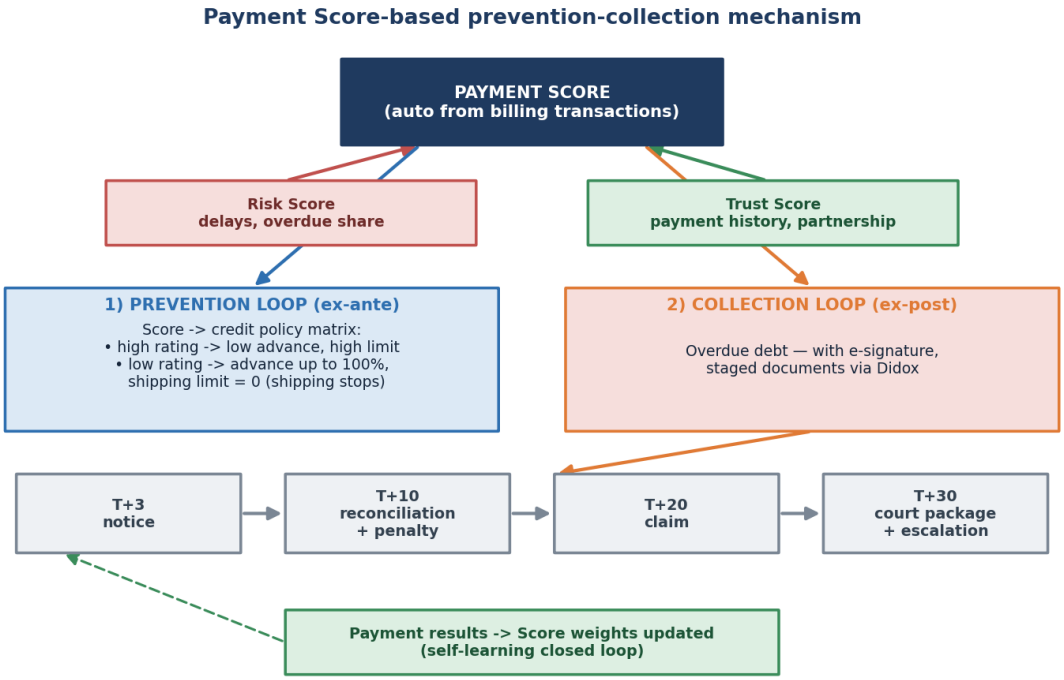

Fig. 2. Automated prevention-collection mechanism based on Payment Score (TO-BE)

Prevention (ex-ante) loop. The score is linked to a credit policy matrix (Table 2). The higher the rating, the lower the advance share and the higher the shipping limit; as the rating falls, the advance requirement rises and the shipping limit drops to zero, automatically halting shipment. The enterprise thus uses its main lever — product shipment — to prevent debt rather than chase it.

Table 2. Credit policy matrix based on Payment Score (illustrative)

Payment Score level	Advance share	Shipping limit	System action
High (Trust-dominant)	0–20%	Maximum	Shipping free, auto-approved
Medium	30–50%	Moderate	Standard contract terms apply
Low	70–100%	Limited	Extra guarantee or prepayment required
Critical (Risk-dominant)	100% (prepaid)	0 (halted)	Shipping blocked, collection loop triggered

Collection (ex-post) loop. If debt still arises, legally binding documents are generated in stages and sent through Didox with an electronic signature (ERI): a formal notice at T+3, a reconciliation act with penalty calculation at T+10, a claim at T+20, and a court-document package with escalation to management at T+30. Escalation branches by counterparty segment — strategic, budget-funded and commercial. Payment results update the score weights, so the mechanism works as a self-learning closed loop. Table 3 compares manual collection with the proposed mechanism.

Table 3. Manual collection versus the prevention-collection mechanism

Comparison criterion	Manual collection (AS-IS)	Prevention-collection mechanism (TO-BE)
Debt identification	daily export, prior-day (T-1) data	real time, automatic from T+1
Ranking criterion	staff experience — subjective	Payment Score — single quantitative metric
Debt prevention	none	advance-limit and shipping permission (ex-ante)
Legal force of documents	verbal call, informal reminder	documents signed with e-signature (ERI)
Document preparation	manual, with delay	automatic: T+3 / T+10 / T+20 / T+30
Feedback loop	broken — not returned to 1C	closed loop — Score updated
Scalability	depends on staff count	unlimited
Audit and transparency	limited	full audit trail (audit_log)

5. Expected effects

Together, the two solutions are expected to reduce manual work and data-entry errors, accelerate working-capital turnover by preventing overdue debt, enable prompt decisions through real-time management dashboards, strengthen transparency through audit trails and e-signed documents, and scale without additional staff. Research on automation supports these expectations: process costs typically fall by 30–50%, RPA markedly reduces processing errors, and analytical tools (BI, AI) can shorten the decision cycle by 50–75%. These figures indirectly justify the economic feasibility of the proposed mechanism.

6. Conclusion

The study identified two weak links in the financial processes of an industrial enterprise — the manual handling of payment data and the broken feedback loop in collection — and proposed two interconnected solutions: a Contract_id-based billing-integration architecture and a Payment Score-based prevention-collection mechanism. The approach turns billing into an operational mechanism that governs cash-and-goods turnover, and shifts AR management from a subjective, reactive practice to a quantitative, preventive and self-learning system. This reduces the human factor and errors, increases transparency and auditability, and accelerates working-capital turnover, ultimately supporting enterprise value and shareholder wealth. Future research should pilot the mechanism and measure its economic effect quantitatively.

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