

Impact of Artificial Intelligence (AI) on Procure-to-Pay (P2P): Transforming Financial Operations and Risk Management



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The procure-to-pay (P2P) cycle covers the full payment operation, starting with requisitioning, purchasing, invoicing, and payment. This function is central to corporate financial management and governance. Despite its importance, this function is affected by many issues such as manual errors, invoice fraud, and lengthy approval processes. Artificial Intelligence (AI) is currently one of the most powerful tools to revolutionize this function by assisting in automation, predictive analysis, fraud detection, and ensuring compliance.

In this article, we are going to discuss the application of AI in various stages of P2P cycle, showcasing its benefits, challenges, and impact on finance professionals. While AI can help with cost efficiencies, speed of execution, and enhanced risk management capabilities, it also raises concerns regarding algorithm bias, data privacy, and regulatory frameworks. Finance professionals

will play a key role in maintaining a balance between automation and professional judgement, shepherding its ethical adoption and guiding organization through this major shift.

Introduction

The procure-to-pay is a back-office function and one of the most critical operations in any enterprise. Starting from the initial purchase requisitions to vendor selection, purchase order creation, invoice verification, and payment processing, P2P represents the backbone of organizational spending and cash flow control. For finance stakeholders including accountants, internal auditors, and CFOs, the effectiveness of P2P directly influences financial accuracy, supports effective working capital management, and ensures compliance with tax and regulatory/statutory requirements.

Despite being such an important function, P2P has historically been infected with inefficiencies. Manual invoice processing has many problems like delays, errors in applying discounts, and it even leads to duplicate payments.

Studies indicate that manual or paper-based invoice processing costs an organization much more than automated processing. Moreover, fraud by suppliers such as false invoices or collusion with employees always remains a high risk.¹

In the last decade, organizations have focused a lot on digitizing the P2P process through the implementation of Enterprise Resource Planning (ERP) systems and building e-procurement platforms. While these systems help in bringing more visibility into the system, they are developed on rule-based workflows that could fail in complex scenarios or fail to detect an emerging fraud pattern. This is where AI appears as the next frontier, ensuring that P2P becomes intelligent and not just a digital tool.

AI is best suited for procurement and accounts payable because of its ability to process unstructured

data, learn from past transactions, and make real time predictions. AI is bringing a shift from reactive to proactive financial operation through different measures like invoice data capturing using natural language processing, and fraud detection through anomaly detection algorithms. This article explains how AI is redefining the P2P function, the benefits it has, the risks it may bring, and the impact on finance professionals.

Historical Evolution of P2P

As time has gone by, the P2P process has evolved in phases, showing technological development and progress in corporate finance.

Pre-digital era: Procurement & payables were completely manual functions. Invoices and purchase order were paper-based and circulated for manual approval, mainly through signatures, making the process slow and error-prone.

¹ U.S. Bank, *Manual AP Process Inefficiencies: Risks and Solutions* — manual AP increases fraud risk and inefficiencies, while automation strengthens controls. <https://www.usbank.com/corporate-and-commercial-banking/insights/payments-hub/payables/manual-ap-process-risks-solutions.html>

Then came the age of ERP system in the 1990s to 2000s, including SAP and Oracle, which were integrated with procurement and finance. While automation helped to standardize workflows, these systems operated largely deterministically and on pre-established sets of prescribed rules. Manual intervention was needed in the event of exceptions, which limited scalability.

The need was very visible to have a system to mimic human action, and in 2010, Robotic Process Automation (RPA) introduced bots which came with the same capability to mimic human actions. It was very useful for repetitive tasks, but it lacked cognitive ability. It was not very helpful in recognizing fraudulent invoices or negotiating supplier terms.

The emergence of AI, more particularly machine learning and natural language processing,

“The Court also affirmed the exporters’ right to pursue their IGST refunds under the general framework of the GST law, effectively removing the obstacle created by the omitted rule.”

has reshaped the P2P function. Unlike ERP and RPA, AI continuously updates itself on data patterns, improves over time, and adapts to handle exceptions. For example, when AI processes invoices, it continuously learns from different patterns and can identify suspicious entries far better than rule-based systems, proving that AI is an intelligent decision-making tool, not just an automation initiative.

AI Applications in the P2P Cycle

As per a 2023 survey conducted by a renowned global consulting firm, procurement leaders across over 40 countries are increasingly adopting digital transformation and advanced technologies, such as analytics and automation, to bring more efficiency and create value within the procure-to-pay function.²

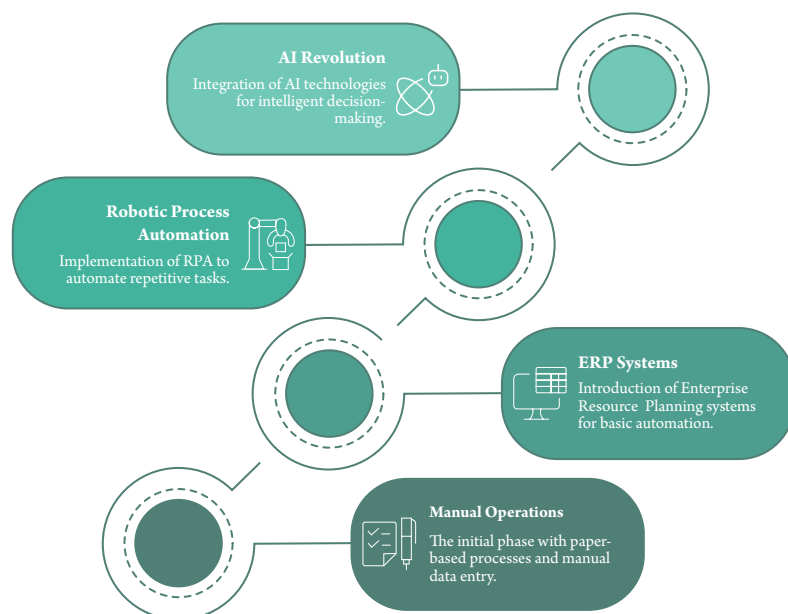
Enterprises are adopting AI and related technologies rapidly. According to a press release by a leading global research and advisory company, AI spending is projected to reach about USD 2.5 trillion by 2026, and this is driven by growth in AI software, services, and infrastructure investment across the industry.³ As per another global management consulting firm, AI systems are redefining the procurement functions by automating routine activities and allowing teams to unlock more value and efficiency, thereby enabling strategic decision-making.⁴

Applications of AI in the following stages of Procure-to-Pay (P2P) cycle, deliver both operational efficiency and strategic insights.

Purchase Requisition and Supplier Selection

AI-enabled forecasting analytics can estimate demand based on historical liquidation or consumption patterns, seasonality, and market trends, and assist organization in preventing stockout situations and minimizing excess inventory. Supplier selection can be done through an automated assessment that includes AI models evaluating a supplier’s financial stability, past performance, credit score, and

Evolution of P2P Process



² Deloitte, 2023 Global Chief Procurement Officer (CPO) Survey. <https://www.deloitte.com/us/en/services/consulting/services/procurement-strategy.html>

³ Gartner Press Release, 2024. <https://www.gartner.com/en/newsroom/press-releases/2026-1-15-gartner-says-worldwide-ai-spending-will-total-2-point-5-trillion-dollars-in-2026>

⁴ McKinsey & Company, The future of procurement in the digital age, McKinsey Insights. <https://www.mckinsey.com/capabilities/operations/our-insights/transforming-procurement-functions-for-an-ai-driven-world>

perhaps even news sentiments. For example, an AI system can bring the declining revenue or negative media coverage of a supplier to the forefront of the risk management process, reducing risk prior to contracting.

Purchase Order Processing

AI can be used to streamline the process of generating a purchase order by automating the process of clearing low-risk transactions, thereby minimizing the need for human intervention. Current ERP system also works very well when it comes to automating the purchase order creation; the only difference AI makes is by suggesting which transaction can be automated based on their risk profile.

Invoice Processing

With the help of Optical Character Recognition (OCR), in combination with Natural Language Processing (NLP), AI enables the automatic extraction of invoice data from PDFs, scanned images, or emails, even in different languages and formats. AI ensures accuracy by matching the invoice to the purchase order and goods/service receipt in an automatic environment and helps reduce errors and manual interventions. Anomaly detection algorithms can prevent duplicate invoice accounting, inflated amounts, and abnormal discrepancies, thereby preventing payment errors.

Fraud Detection and Compliance

Publicly available data highlights the rising risk of payment fraud in financial operations. According to the Federal Bureau of Investigation’s Internet Crime Complaint Center (IC3) 2024 report, reported losses from internet-enabled financial crimes in the United States increased to approximately USD 16.6 billion in 2024, compared to USD 6.9 billion in 2021 (~140% increase).⁵

This figure and growth shows why continuous monitoring of transactions is a critical part of P2P cycle for identifying fraud or collusion. However, when performed manually, this task is often time-consuming and monotonous, which makes it vulnerable to fraud. This is where AI can play an important role in preventing corporate fraud by analyzing patterns such as repeated invoice submission from shell vendors or unusual payments. Also, AI helps ensure compliance by matching invoices with tax filing authorities such as GST (India) and VAT (EU). AI can keep a track of real-time audit trail, thereby providing regulators and auditors with transparent documentation and approvals for all exceptions.

Payments and Working Capital Optimization

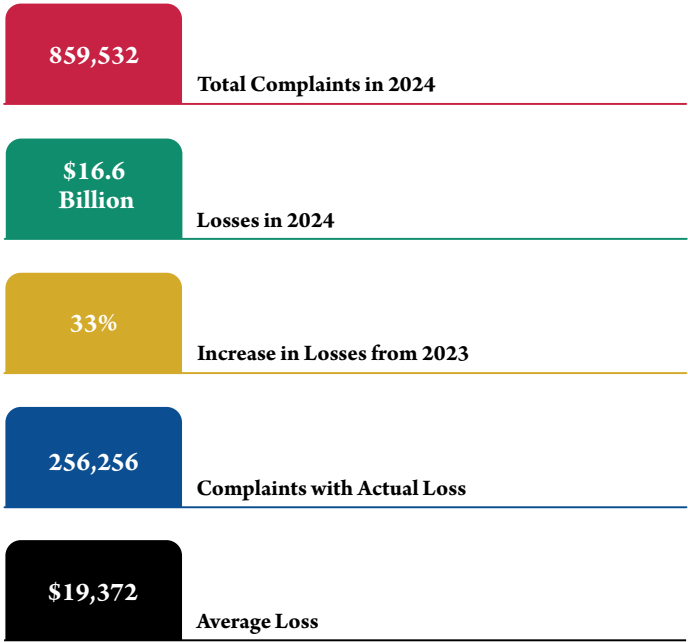
AI analyzes the payment schedule, working capital requirements, and recommends early payment

discount opportunities, extending supplier payment terms, and aligning with the organization’s liquidity needs. Machine learning models can be used to accurately forecast an organization’s cash requirements, enabling CFOs to maintain liquidity and optimize working capital requirements. Multinational companies use AI to ensure compliance in cross-border transactions and simulate currency exposures.

User Support

AI chatbots can provide real-time information on procurement queries like invoice status, purchase order approval hierarchy, and supplier information. Conversational AI can also assist suppliers in monitoring the status of payments for greater transparency and relationship-building. In fact, this reduces the reliance on finance staff for day-to-day queries and enables them to concentrate on strategic tasks.

2024 BY THE NUMBERS



Source: FBI/IC3 Annual Report 2024

⁵ Federal Bureau of Investigation. (2025). 2024 Internet Crime Report. Internet Crime Complaint Center (IC3). https://www.ic3.gov/AnnualReport/Reports/2024_IC3Report.pdf?

Benefits of AI-Enabled P2P

Operational Efficiency

The introduction of AI and automation in invoice processing has shown significant improvements in operational efficiency, reducing manual effort, and lowering processing costs compared to manual methods. Companies that incorporate AI-powered automation have better data extraction and validation capabilities, resulting in higher throughput and better accuracy in accounts payable processes.^{6,7,8,9}

Accuracy and Compliance

Automatic data capture helps reduce errors in invoice matching, accounting, and purchase order validation. AI can ensure compliance with several regulatory and statutory requirements like GST, VAT, or SOX, ensuring strong internal controls.

For instance, under the GST framework, validation of e-invoices must be done through the Invoice Registration Portal (IRP) and linked to the Input Tax Credit (ITC) reconciliation process via GSTR-2A/2B. AI can significantly automate this process by:

- Extracting invoice metadata and validating the Invoice Reference Number (IRN), QR code, and HSN/SAC accuracy.
- Identifying mismatches between vendor-reported details on IPR and purchaser-recorded invoices in GSTR-2A/2B on various fields such as GSTIN, invoice number, GST amount, invoice date etc.
- Flagging ineligible ITC items, including blocked credits under

Section 17(5) (e.g. personal consumption, food, club memberships), reverse-charge transactions where credit is deferred until tax payment, and exempt or non-GST supplies.

Risk Management

Continuous monitoring through AI helps identify potential duplicate payments, fictitious vendors, or unusual transactions. Predictive analysis can estimate supplier risk and mitigate insolvency or default risks well ahead of time.

Supplier Relationship Management

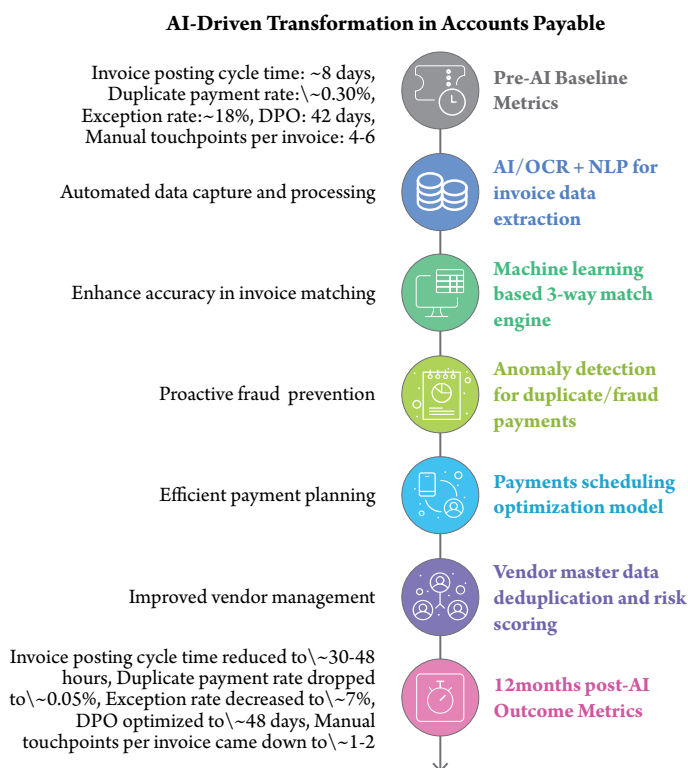
Accelerated transaction processing with minimum errors results in faster invoice approval, processing, and timely payments. This enhances

supplier trust, which is especially important for MSMEs reliant on predictable cash flow. Improved communication and faster response times through AI chatbots help build strong strategic partnerships.

Strategic Insights

Analytics through AI caters to the CFOs' need for predictive insights on cash flow, working capital optimization, and procurement trends, enabling data-backed decisions rather than reactive management.

The figure below presents an anonymized case example based on aggregated performance metrics consistent with commonly reported procure-to-pay process outcomes.



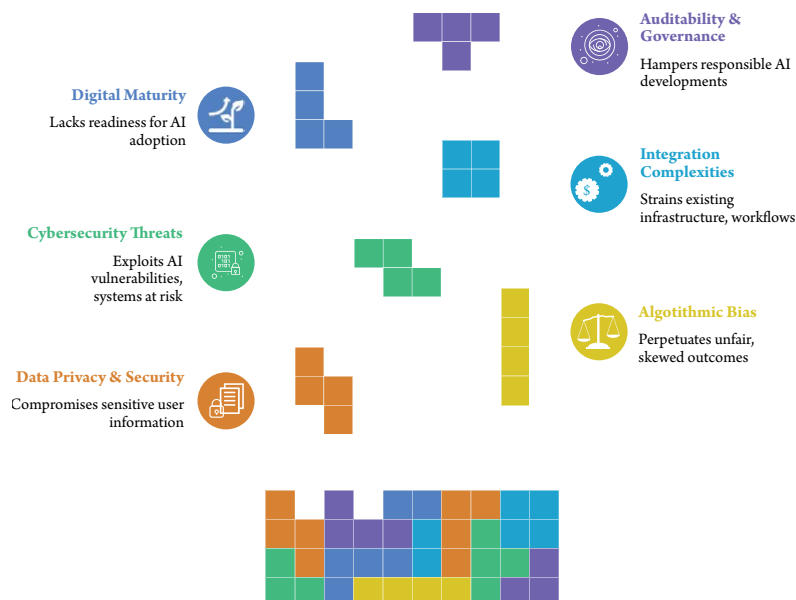
⁶ Onteddu, K. R. (2025). AI-Powered Invoice Automation in ERP Systems: Revolutionizing Accounts Payable, *Journal of Computer Science and Technology Studies*. https://www.researchgate.net/publication/392462577_AI-Powered_Invoice_Automation_in_ERP_Systems_Revolutionizing_Accounts_Payable?

⁷ Accounts Payable Automation Trends 2024 Report — automated AP processes can reduce processing times and improve accuracy. <https://acarp-edu.org/accounts-payable-automation-trends-2024/>

⁸ 2025 Accounts Payable Automation Trends, *Concur Insights* — AP professionals report efficiency gains and reduced manual tasks with automation. <https://www.concur.com/blog/article/2025-accounts-payable-automation-trends-report-key-takeaways?>

⁹ AP Automation: Benefits to the Accounts Payable Process, *JPMorgan Insights* — streamlines invoice processing and strengthens vendor relationships. <https://www.jpmorgan.com/insights/treasury/payables-disbursements/ap-automation-benefits-to-the-accounts-payable-process?>

Navigating AI Implementation Challenges



Challenges and Risks

Data Privacy and Security

AI systems work mainly on datasets that mostly contain supplier and employee information. Ensuring compliance with different regulations like India's Digital Personal Data Protection Act (DPDP)¹⁰, GDPR (EU)¹¹ and state-level privacy laws to protect the privacy of stakeholders is critical. Mishandling data could lead to penalties from these regulators, and at the same time, it can also damage the organization's reputation.

For instance, the DPDP Act, 2023 requires companies to ensure that vendor KYC and banking verification data are processed:

- Legally and with consent for a specific procurement purpose.
- Following data minimization and purpose limitation principles.
- With clear retention and deletion policies.

- With protection against cross-border data transfer risks in case of a global AP platform.

Incorporation of DPDP compliance logic, including masking, encryption, and access control audits, is a must in AI-based KYC and vendor risk screening.

Algorithmic Bias

Training AI models with historical data might result in inadvertently penalizing certain suppliers; specifically those MSMEs with limited transaction history. Bias in risk scoring or invoice prioritization may lead to unfair exclusions.

To prevent algorithm bias in the case of MSMEs, organizations should:

- Use alternate data sources (on-time delivery score, dispute ratio, GST compliance track record).
- Wherever possible, provide human review for avoidance of MSME risk.

- Monitor invoice ageing and adjust payment rules to prioritize MSME supplier's payment on time to preserve their working capital flow.
- Ensure alignment with MSME payment guidelines as per the MSME Development Act, 2006, which mandates payment to MSME suppliers within 45 days.

This ensures that MSMEs are getting equal or prioritized supply chain treatment, consistent with India's economic and inclusion priorities.

Cybersecurity Threats

AI systems are vulnerable to attacks such as data poisoning, model theft, or adversarial inputs. A compromised system could approve fraudulent payments at scale, creating operational and financial risks.

Table 1 summarizes the key threats along with mitigation controls and audit test procedures.

Integration and Digital Maturity

In the case of smaller organizations, AI may not seamlessly integrate with their legacy ERP systems (e.g., SAP ECC, Oracle E-Business Suite, Tally ERP) as these organizations often lack digital maturity, making adoption technically challenging and costly.

Auditability and Governance

It is very well possible that the AI-driven decisions can function as "black boxes", which can create complications when it comes to internal or statutory audits and regulatory reporting. Having explainable AI and a strong governance framework is critical to satisfy auditors, the board, and regulators.

¹⁰ Ministry of Electronics and Information Technology, Government of India, Digital Personal Data Protection Act, 2023. <https://www.meitv.gov.in/static/uploads/2024/06/2bf1f0e9f04e6fb4f8fef35e82c42aa5.pdf>

¹¹ European Union, Regulation (EU) 2016/679 – General Data Protection Regulation (GDPR). <https://eur-lex.europa.eu/eli/reg/2016/679/oj>

Table 1.

Threat	Mitigation Controls	Auditor Testing Procedures
Data Poisoning (e.g. fraudulent or manipulated invoice data used for training)	- Input validation and automated checks on source invoice data integrity - Training data provenance logs capturing the source and timestamp of all data used - Segregation of duties ensuring model trainers do not have vendor creation or AP posting rights - Model drift monitoring to detect unexpected behavior shifts	- Inspect data lineage documentation and sample training datasets to confirm approved sources - Verify access controls to training and confirm SoD enforcement - Review drift monitoring logs and follow up on anomalies and remediation evidence
Adversarial Inputs (e.g. manipulated invoice or abnormal character sequences bypassing fraud detection)	- Robust document parsing with multi-engine NLP validation - Anomaly scoring for unusual vendor behavior, invoice structures, or tax patterns - Ensemble validation comparing system results with rule-based checks - Rejection thresholds that require human review for out-of-pattern invoices	- Validate algorithm rule thresholds and exception escalation workflow - Reperform sample invoice testing to confirm anomalies are flagged - Review AI model explainability logs documenting why high-risk invoices were flagged or cleared

Implementation or Practitioner Checklist for Finance Professionals

The following checklist can help finance professionals operationalize AI in the P2P process. Each section of the checklist summarizes key procedures and controls for ensuring compliance, accuracy, and audit readiness.

(i) P2P Control Metrix

Table 2.

Control Objective	AI Feature / Control	Key Checkpoints	Example Parameters
Three-Way Match	Automated matching of PO, GRN, and Invoice	Validate logic for tolerance levels; review exceptions flagged	±2% price variance or ±3 quantity tolerance, combined with a value limit
Duplicate Detection	Anomaly detection / pattern recognition	Confirm that the training dataset includes duplicate cases	Threshold: same vendor + same PO + same amount or same vendor + same invoice + same amount
Vendor Fraud Prevention	Predictive risk scoring	Validate that the vendor risk model uses independent data sources	Red flag on inactive or mismatched bank details, weak financial health, or promoter background, using third-party platforms such as LexisNexis, IDfy, SignalX
Payment Authorization	Workflow automation	Confirm that multi-level approval is triggered for high-value invoices	> USD 50,000 requires dual authorization, and ensure segregation of duties between the initiator and approver of the payment

(ii) Model Validation Steps – A Practical Approach**Table 3.**

Step	Objective	Practical Action
1. Data Integrity Check	Ensure training and transactional data are complete, accurate, and recent	Reconcile source data (invoices, vendor master) with ERP extracts; remove duplicates and incomplete records
2. Model Accuracy Testing	Confirm that AI output (e.g., fraud flag, duplicate detection) is reliable	Run historical transactions through the model; compare results with known outcomes; document accuracy percentage
3. Threshold & Rule Validation	Ensure AI parameters align with the business risk appetite	Review risk-scoring thresholds (e.g., duplicate detection >95% confidence) with the finance/controls owner
4. Bias & Exception Review	Detect unintended discrimination or false positives	Sample flagged and non-flagged transactions across suppliers and geographies; analyze any bias-related trends
5. Periodic Re-Validation	Confirm ongoing model performance and explainability	Re-test the model quarterly or after major data updates; maintain a validation log with sign-off by the finance lead

(iii) Audit Trail Requirements – Ensuring Traceability, Accountability, and SOX Compliance in AI-P2P Systems

Financial integrity is the backbone of a strong financial system, and to maintain its effectiveness, a robust and verifiable audit trail is essential, ensuring compliance with SOX Section 302 and 404 and supporting both internal and statutory audits.¹²

AI-driven P2P system must maintain detailed and untampered logs of all automated and manual activities, enabling traceability, control effectiveness, and gaining auditors' confidence.

Table 4.

Audit Trail Area	Control Requirement	Practical Example	SOX/SOC Reference
Input Data Traceability	Every data element (invoice, PO, GRN, vendor master) must be traceable to its source with date/time stamps	Record source document ID, import timestamp, and file hash in AI system log	SOX 404 – Data integrity in financial reporting
Outcome logging	Maintain details of all AI-generated outcomes with reasoning or algorithmic parameters	Store fraud scores, duplicate detection logic, and reviewer ID	SOC 1 / SOX 302 – Transparency in automated control logic
Manual Override Record	Require mandatory justification for every human override of AI suggestions	Finance users enter reasons for approval when overriding flagged invoices	SOX 404 – Management assessment of control effectiveness
Approval & Exception Workflow History	Time-stamped records of all approvals, rejections, and escalations	Approval chain with names, roles, and timestamps stored in a read-only database to avoid alteration	SOX 404 – Evidence of approval hierarchy and segregation of duties
System Access & Security Logs	Track logins, admin changes, and data exports to detect unauthorized access	Generate user ID, activity type, and timestamp reports for audit	SOC 2 / SOX 404 – IT general controls (logical access)
Retention and Archival Policy	Preserve audit logs as per statutory or corporate retention periods (typically 7–10 years)	Secure read-only archival in compliance repository (e.g., SAP GRC)	SOX 404 – Record retention for audit support

¹² Sarbanes–Oxley Act of 2002, Sections 302 and 404. <https://www.govinfo.gov/content/pkg/PLAW-107publ204/pdf/PLAW-107publ204.pdf>

Policy and Professional Implications

For Regulators

Accounting standard setters and tax authorities should modify the rules for AI-powered P2P interchange. For instance, as part of e-invoicing reconciliation requirements, AI systems may need to keep an audit trail to meet GST or SOX audit requirements.

For Finance Professional

Their role must expand to assume additional responsibilities for auditing AI models, validating outputs, and providing recommendations on governance frameworks. They must ensure that controls are in place to enable ethical AI adoption, remove algorithm biases, and ensure compliance with corporate, tax, and payment regulations.

For Organizations

CFOs and finance leaders must drive AI adoption and manage risks through a robust internal control system and by establishing AI governance policies (e.g., risk registers, exception reporting, and exception oversight committees).

For Suppliers

It helps improve supplier trust and engagement when organizations have transparent AI-driven P2P processes. It ensures fair treatment across the supply chain through ethical and compliant AI usage.

Conclusion

AI has transformed the P2P function and has taken it from being just a back-office process to a strategic tool for driving value, compliance, and trust. By improving efficiency, reducing fraud risks, and ensuring

compliance, AI becomes an anchor of financial governance for P2P. But the change is not without risk. Governance frameworks issues related to cybersecurity threats, algorithmic bias, and auditability challenges highlight the importance of strong governance practices.

In the case of India, where economic priorities are crucial for tax compliance, MSME supplier ecosystems, and digitization, the adoption of AI will have to be tailored and managed appropriately. Ultimately, finance professionals will continue to play a key role, making sure that AI-powered finance isn't just innovative but also ethical, transparent, and accountable.

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