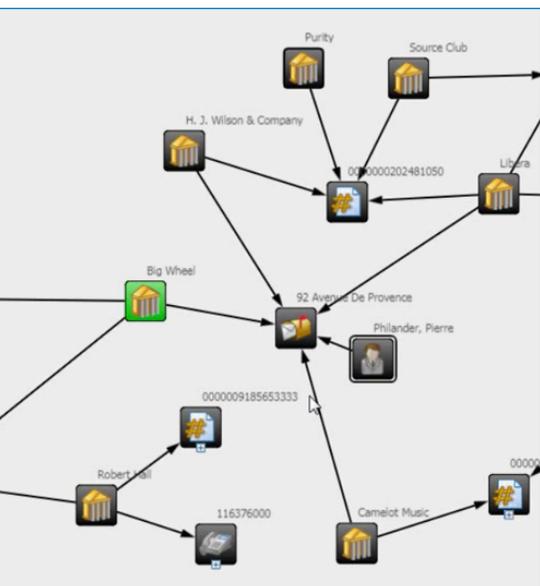# SAS® for Procurement Integrity

Fast and effective control over your procurement process and life cycle

What does SAS® for Procurement Integrity do?

The solution optimizes the integrity of your procurement processes and prevents losses by combining data management and risk scoring on transaction, purchase order and supplier levels. It's built on proven procurement models and rules and a triage environment based on years of procurement forensics experience.

Why is SAS® for Procurement Integrity important?

Procurement inefficiencies can lead to financial loss (estimated at 1-4 percent of procurement spend) and reputational risk. Our solution comes with predefined procurement scenarios and advanced analytics to identify risky and exceptional behavior that exists within your procurement life cycle to avoid loss and risk.

For whom is SAS® for Procurement Integrity designed?

No matter what industry (utilities, manufacturing, government, retail, finance or government), the solution helps all those involved with the procurement process to better monitor and track the tender and purchasing process. Internal audit/control, supply chain, finance, compliance and security, in-house counsel and purchasing – even the CFO – can realize significant benefits.

All organizations and businesses rely on external vendors, suppliers or other third parties to support their flow of commerce and operations and to deliver goods and services to their clients. To ensure the procurement life cycle runs smoothly, organizations have procedures and controls in place to make sure they obtain the correct items at the right time with acceptable conditions and agreed-upon quality.

But like any other business process, sometimes things can go wrong. It may be that defective goods are delivered. Or there could be double invoices, ghost invoices, goods that aren't requisitioned but are billed, or billed goods that aren't delivered. Even goods that are billed and delivered with an excessive price. Procurement process deficiencies have affected about 75 percent of organizations in the last three years, including Fortune 500 companies, small businesses and government agencies.[1]

Manual audits rely on the skill of the auditor to detect abnormal behavior from a vast array of information, and only happen at a

single point in time; they don't provide continuous monitoring. A host of other challenges can increase risk in your procurement process, such as dispersed procurement functions and too few resources. And without data capture from third-party sources to add valuable insights, or insufficient analytics tools and resources, you're left with only business rules that can't keep up. That's where SAS can help.

Benefits

- **Smart and focused audit**. SAS provides you with comprehensive decision management. Discover and trigger alerts and events of interest through the deployment of advanced analytics models, business rules and scenarios, and by integrating with third-party systems to exchange information.

- **Automation**. Use more automated processes to ingest data, apply data quality assistance and generate risk scores to look at more aspects from more data sources. Not only do you speed up the process and free valuable resources, but you also gain more consistency and achieve better compliance.

- **Better accuracy**. With cleaner data and extensive scenario management (risk scoring rules) capabilities, your analysts get the insights they need to increase accuracy and reduce false negatives – as well as false positives.

- **Investigative workspaces for collaboration, compliance and efficiency**. With access to an interactive visualization, search and investigative workspace, your analysts can build, gather, explore, visualize and manipulate data that's pertinent to their investigation or research, and take static clips of visualizations to narrate maps, timelines, networks and other content.

- **Speed to intelligence**. The big data analytics capabilities of SAS for Procurement Integrity enable quick decisions about whether to stop invoices, payments or purchase orders. By focusing attention on potential high-risk items, SAS reduces disruption and delays for the majority of low-risk items. This is especially important in keeping vendor and customer impact to acceptable levels.

1 Third-party governance and risk management: The threats are real, Deloitte, 2016.

Overview

If you're only using simple rules-based logic to find abnormalities in your procurement life cycle, you're missing a much greater percentage of the riskier elements that cause losses for your organization. SAS takes a far more comprehensive approach – including data management, advanced analytics, more accurate risk scoring and data visualization – along with our highly skilled domain experts showing you the way. We deliver software and services to help you:

- Identify and combine information from different systems, agencies and third-party data sources to augment knowledge about suppliers, people and products and resolve entities.
- Employ a combination of analytical techniques – such as clustering, segmentation, pattern recognition and associations – to determine or predict the overall risk posed by each payment, invoice, supplier or purchase order.

- Improve investigations by integrating data with other types of intelligence to manage a workflow that reflects organizational objectives.
- Communicate through reporting that provides information to key decision makers in the form of dashboards, portals, web analytics, mobile reporting, briefings and alerts.

Predictive analytics provides objective, data-driven risk screening to identify high-risk and low-risk purchase orders, suppliers, invoices and payments. With more effective monitoring, you can improve your success in targeting wasteful or high-risk billing and purchase orders by incorporating intelligence from a variety of sources. More precision helps to identify high-risk events that should be reviewed in closer detail – while not delaying the processing of other events.

While procurement officers remediate high-risk processes and secure the financial position of your organization, internal audit officers can validate operational processes more swiftly and your finance department can establish more efficiency in control statements.

Automating much of the data management, alert generation and workflow streamlines operations and enables analysts to make decisions quickly through an easy-to-use investigative interface. Users can review all relevant data, perform advanced searches and apply temporal or geospatial methodologies on a single platform.

All of these measures can be put in place to guarantee more effective controls and out-of-the-box reporting. And you get value fast because our procurement experts from multiple industries, who fully understand your challenges across the procurement life cycle, designed the solution.
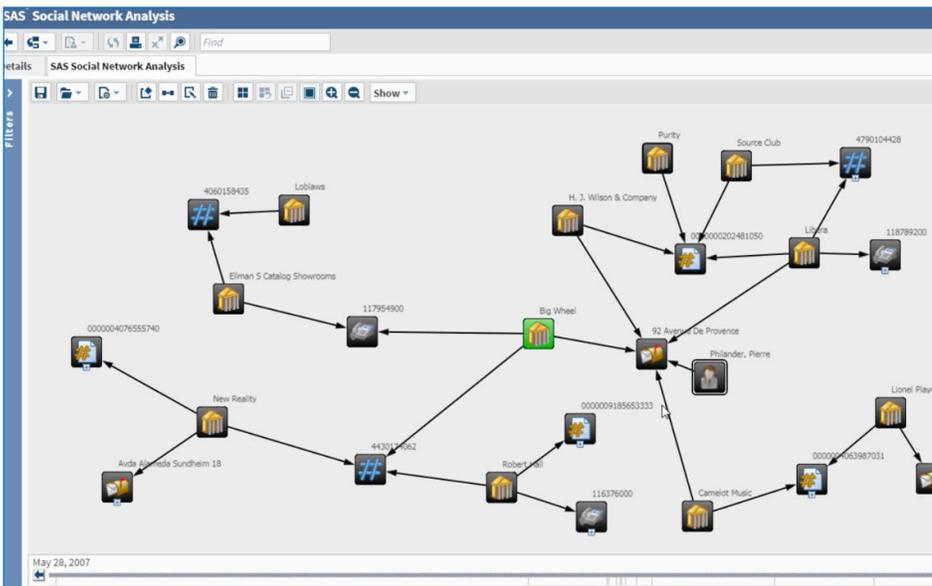

Figure 1. The solution provides link chart data visualizations to understand complex relationships across entities.
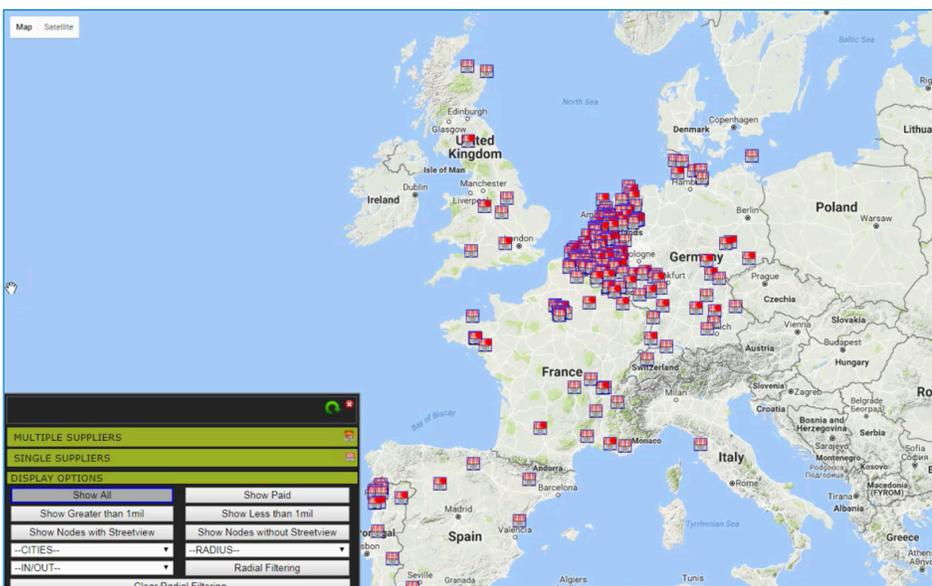

Figure 2. Using data visualization, this report plots vendors to a map and allows users to filter by specific procurement criteria.

Capabilities

Data management

With data management from SAS, you can integrate data from multiple, even third-party, sources. Pull data directly from your ERP system and transfer this data to

analytical views, using your own customized frequency to fit the cycle of the business processes involved. SAS can extract a richer set of relevant data from purchase orders, invoices, checks, systems, external data sources, unstructured text and other disparate data sources to uncover inefficiencies and risks.

Business rule deployment

By bringing in more data, you can process all purchase orders, payments and other artifacts against known business rules. Investigators can add to or modify the rules engine as new schemes are uncovered, rather than waiting for a new release before making updates. This helps you detect more risky behavior faster and adapt yourself to new standard operating procedures.

Advanced analytics and model deployment

As the leader in analytics, SAS delivers a procurement analytics data model, procurement-specific scenarios and a large set of rules that, together, enable you to take advantage of the power of advanced analytics immediately. You can quickly enhance your existing business rules through the discovery of emerging suspicious purchase orders, invoices, checks and activity that would otherwise go unnoticed. And discover items that warrant more attention as early as possible – at the prepayment stage – before money has gone out the door.

Detection, alert generation and management

The SAS scoring engine uses a combination of analytic techniques to determine a risk score. And based on years of experience with triaging and doing preliminary investigations on alerts, we've developed a sophisticated alert detection, generation and management function that achieves the greatest level of accuracy possible from your data.

SAS lets you prioritize and visualize alerts in different views to gain context. You can enhance alerts by adding entities and integrating and connecting data. Escalate events by routing alerts or changing their priorities and designate an alert to prompt a deeper

Key Features

Data management
- Extracts relevant data from purchase orders, invoices, payments, ERP systems, external data sources, unstructured text and other disparate data sources for richer analysis.

Business rule deployment and learning cycle
- Imports business rules from existing rules engines for known risks.
- Uses an iterative, closed loop process to capture and maintain changes to the business rules engine as new schemes are uncovered.

Advanced analytics and model deployment
- Includes a procurement analytics data model.
- Provides a large set of heuristic rules with anomaly detection.
- Advanced predictive modeling risk-scores suspicious purchase orders, payment requests, etc. early in the adjudication process for investigation.
- Ability to customize your models to uncover suspicious activity not detected by existing business rules.

Detection and alert generation
- Scores purchase orders, payments, etc. in real time at policy inception with an online scoring engine that uses a combination of business rules, anomaly detection and advanced analytics techniques.
- Calculates the risk associated with, for instance, a purchase order; then rescores at each settlement stage as you capture new data on the artifact, including delivery notes, invoices and amendments.

Alert management
- Assembles alerts from multiple monitoring systems and associates them with common individuals.
- Calculates risk scores based on specific characteristics of the activity, with transparent reason codes.
- Prioritizes alerts and routes risky purchase orders, requests for payment, etc. to appropriate team members.
- Can assign work automatically to various investigators or analysts based on user-set rules and requirements.

Social network analysis
- Detects and prevents organized abuse by going beyond transaction and account views to analyze all related activities and relationships at a network dimension.
- Intuitive interface lets investigators identify linkages among seemingly unrelated procurement purchase orders, payment requests, etc.
- Produces independent and combined risk scores.
- Annotates nodes and groups, including text and basic HTML tagging and HTML-linked images.
- Easy Group Detail Review allows viewing of the group content without expanding the group, and single-click "Undo" to regroup the last group expanded.
- Administrators can tag certain nodes as anchor nodes and indicate whether, by default, to anchor purchase orders, invoices and other artifacts.

investigation. You can even go beyond detecting deviant behavior in procurement through purchase orders, invoices, bid-rigging, ghost employees, etc., and prevent people from taking out purchase orders in the first place.

Our alert management capabilities provide investigators with a more complete perspective on the risk of an item. This enables greater efficiency, increased detection rates and reduced losses.

Social network analysis

With social network analysis from SAS, you're able to understand relationships between parties involved in the procurement and fulfillment process through advanced analytics. We've designed our solution in such a way that users don't need an advanced understanding of how parties are tied together, nor do they need to manually tie them together in the software. These associations are automatically detected and presented to users. Investigators can improve their efficiency by checking large volumes of seemingly unrelated purchase orders, invoices, etc. to identify problems and patterns and uncover previously unknown relationships.

Assess the overall risk on a customer, transaction or network basis, and manage relationships among entities via the supporting visual exploration of identified social network connections among nodes and groups. Investigators can enter information directly on the node and save the diagram with the annotations. Annotations can include text and basic HTML tagging and HTML-linked images.

Run-time enhancement options allow the addition of nodes and links to the social network analysis diagram during operation.

By launching an Add Nodes panel, properties such as node color, icon specification, labels and link parameters can be indicated during a session.

Spur node auto-grouping causes lone, or spur, nodes to be clustered automatically with the single connected entity or group. Auto-grouping allows the social network analysis diagram to display and redraw quicker. This is a recursive activity, and the groups can be reviewed or expanded for detailed investigation.

Automated data analytics and reporting

SAS provides automation that enables quick decisions about whether to stop invoices,

payments or purchase orders. Disruption and delays are reduced for most low-risk items, so there is minimal disruption to vendor relationships. We deliver descriptive, relevant and understandable information on why an event has occurred or an alert is generated to help you make control and process change decisions.

Your staff can go beyond individual invoice or payment views to analyze all related activities and relationships at a network dimension. For example, entity relationships are apparent if individuals are regularly associated in agreeing purchase orders and/or associated invoices, or have other relational attributes or behavioral patterns in common. Once you establish the linkages, you can factor them in to the risk-scoring models.
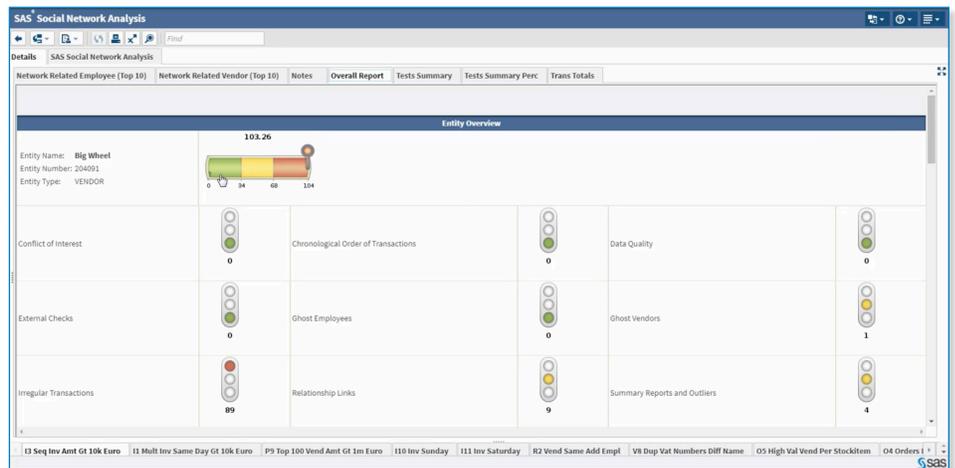

Figure 3. The Overall Report tab of the social network analysis shows the categories of scenarios that constitute the alert risk score.

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To learn more about SAS for Procurement Integrity, download white papers, view screenshots and see other related material, please visit sas.com/procurement-integrity.