

SankeyEngine for Excel: Quick Start & Analytics Overview

End-to-End Transparency for Complex Operations

SankeyEngine helps you turn complex flow data into interactive Sankey diagrams directly in Microsoft Excel.

Instead of looking at isolated numbers or separate reports, you can see how values move through a system from start to finish. This makes it easier to understand where flows come from, where they go, and which parts of the process have the biggest impact.

You can use SankeyEngine for many types of flow-based analysis, including finance, operations, supply chains, sales funnels, production processes, IT systems, and other multi-step workflows.

The tool is designed to do more than simply draw a Sankey chart. It also adds analytical views that help you inspect individual nodes, compare flows, trace outcomes, and identify the main sources behind a selected result.

SankeyEngine runs inside Excel, so you can work with your existing data in a familiar environment.

Use it to explore questions such as:

- Where does the flow come from?
- Where does it go?
- Which nodes carry the most volume?
- Which inputs or outputs are most important?
- What happens downstream from a selected point?
- Which sources contributed to a final result?

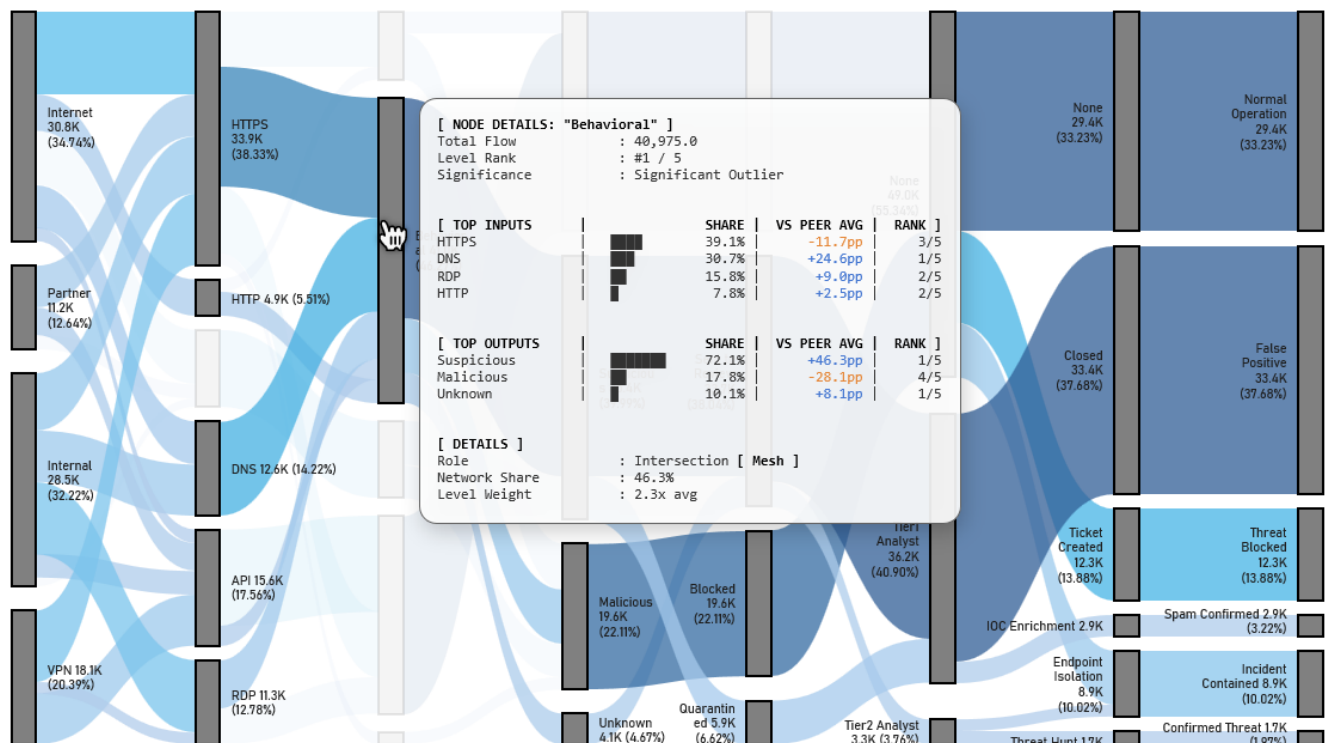
Supported Analytical Modes

Our engine supports three primary analytical perspectives out of the box, designed to handle extreme structural complexity (up to 15+ levels deep). To serve the needs of the entire organization, every mode offers a **dual-perspective view**: a streamlined '**Business**' layer for executive decision-making and a '**Extended**' layer for deep-dive statistical analysis, bridging the gap between high-level oversight and technical data science.

Mode 1: Systemic Health & Operational Balance

Mode 1 provides an instantaneous assessment of any node's contribution to the total system flow. It identifies where resources converge or deviate from expected benchmarks. It provides an immediate pulse-check on the health and balance of any specific node within your system. In the example below, we are looking at a Security Operations Center (SOC) workflow analyzing a "Behavioral" detection node.

Business view:

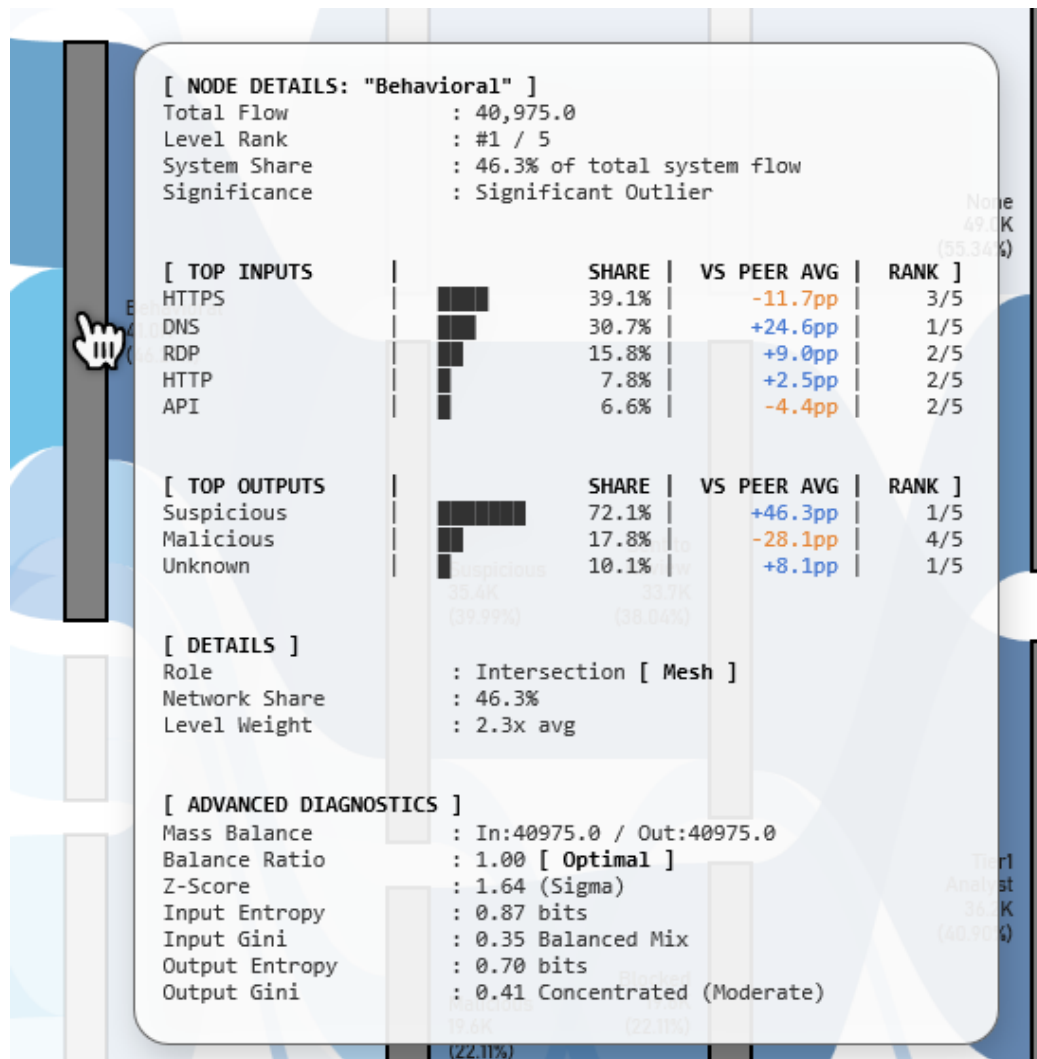


The Business View is engineered for **rapid strategic clarity**. It translates complex flow dynamics into three actionable categories:

- **Node Significance (Total Flow):** Provides instant visibility into the total volume passing through a specific point and its relative importance to the organization. The engine automatically flags "**Significant Outliers**" - anomalies that require immediate executive attention.
- **Comparative Benchmarking (Vs Peer Avg):** This is where the engine's intelligence is most visible. It does not merely show data distribution; it compares the performance of a node against the average of all other nodes in the same layer.
- **Actionable Insight:** If a specific channel (e.g., DNS traffic) is **+24.6pp higher** than the peer average, the engine ranks it **#1**, signaling a priority area for intervention or investigation.
- **Critical Junction Identification (Details):** Identifies the node's structural role within the system, such as a **Critical Junction (Intersection [Mesh])** where multiple flows converge. It also quantifies the node's **Systemic Footprint (Network Share)**, showing exactly how much of the total operation relies on this single point.

Extended view:

While the Business View identifies **what** is happening, the **Advanced Diagnostics** block provides the mathematical proof of **why**.

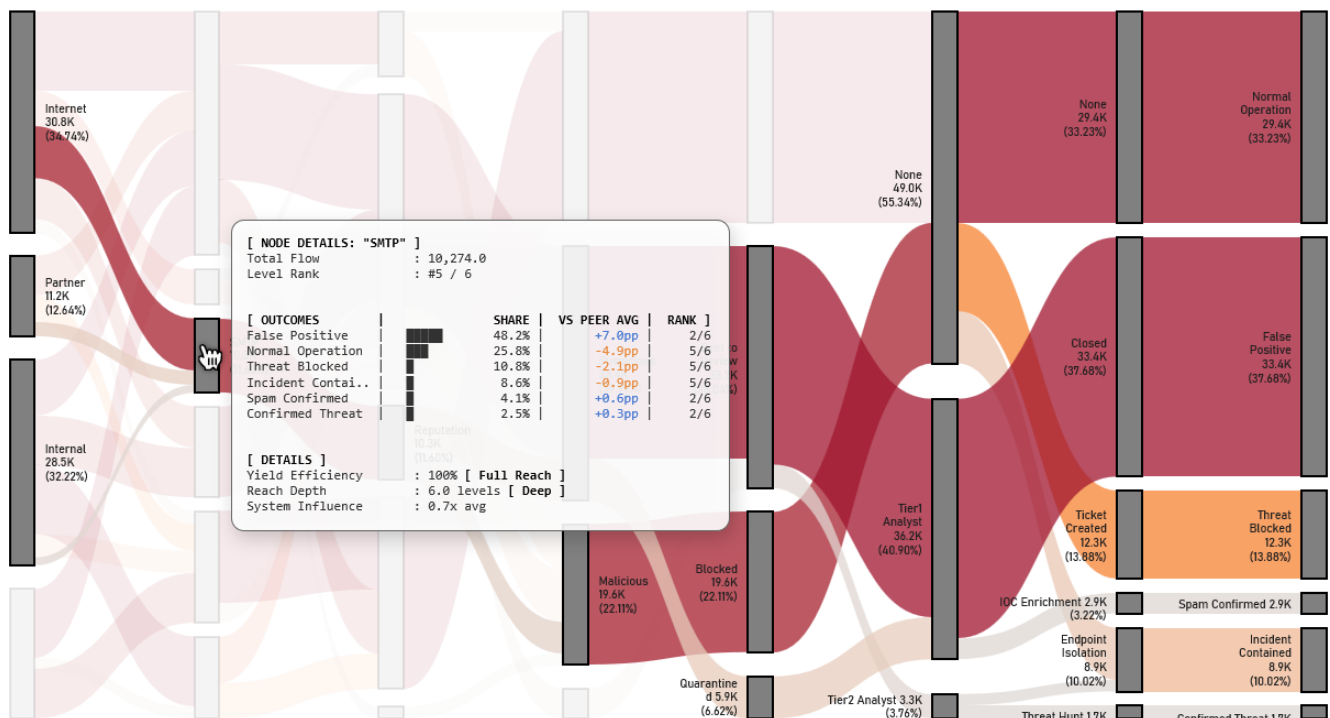


- **Priority Rating (Z-Score):** This indicates how far a node's behavior deviates from the systemic norm. A **1.64 Sigma** flags the node as noteworthy and statistically significant, alerting leadership to a deviation that requires monitoring before it escalates into a critical anomaly.
- **Process Discipline (Entropy):** Quantifies the predictability of your operations. A **low entropy** score suggests a highly disciplined, predictable process following a standard path. Conversely, **high entropy** signals systemic "chaos" or unexpected branching, indicating a loss of control over the flow.
- **Concentration Profile (Gini Index):** Measures risk and outcome concentration across your channels.
 - **Input Diversity (0.35 [Balanced Mix]):** Confirms that your incoming flows are healthily distributed, reducing dependency on a single source or vendor.
 - **Outcome Bias (0.41 [Moderate]):** Identifies when results are starting to concentrate in a specific direction. In this diagnostic, it signals that outputs are leaning disproportionately toward "**Suspicious**" classifications, requiring a review of downstream logic.

Mode 2: Impact Simulator (The Predictive View / Downstream)

Mode 2 is a **predictive simulation engine** that shifts focus from current status to future consequences. By selecting any junction, the system instantly traces every trajectory to show the final destination of all data, capital, or resources.

- **Quantifying the "Domino Effect":** The engine isolates local interventions to measure how changes cascade through every connected layer of the operation.
- **Terminal Attribution:** By bypassing intermediate complexity, the system reveals the final "**Bottom Line**". It identifies exactly what percentage of a specific flow - such as the "SMTP" node - eventually results in a terminal outcome like a "False Positive" or "Confirmed Threat".
- **Strategic ROI Validation:** This mode serves as the ultimate tool for testing disruptions before deployment. Leaders can validate if tightening a policy or optimizing a route will meaningfully improve final margins or risk scores.

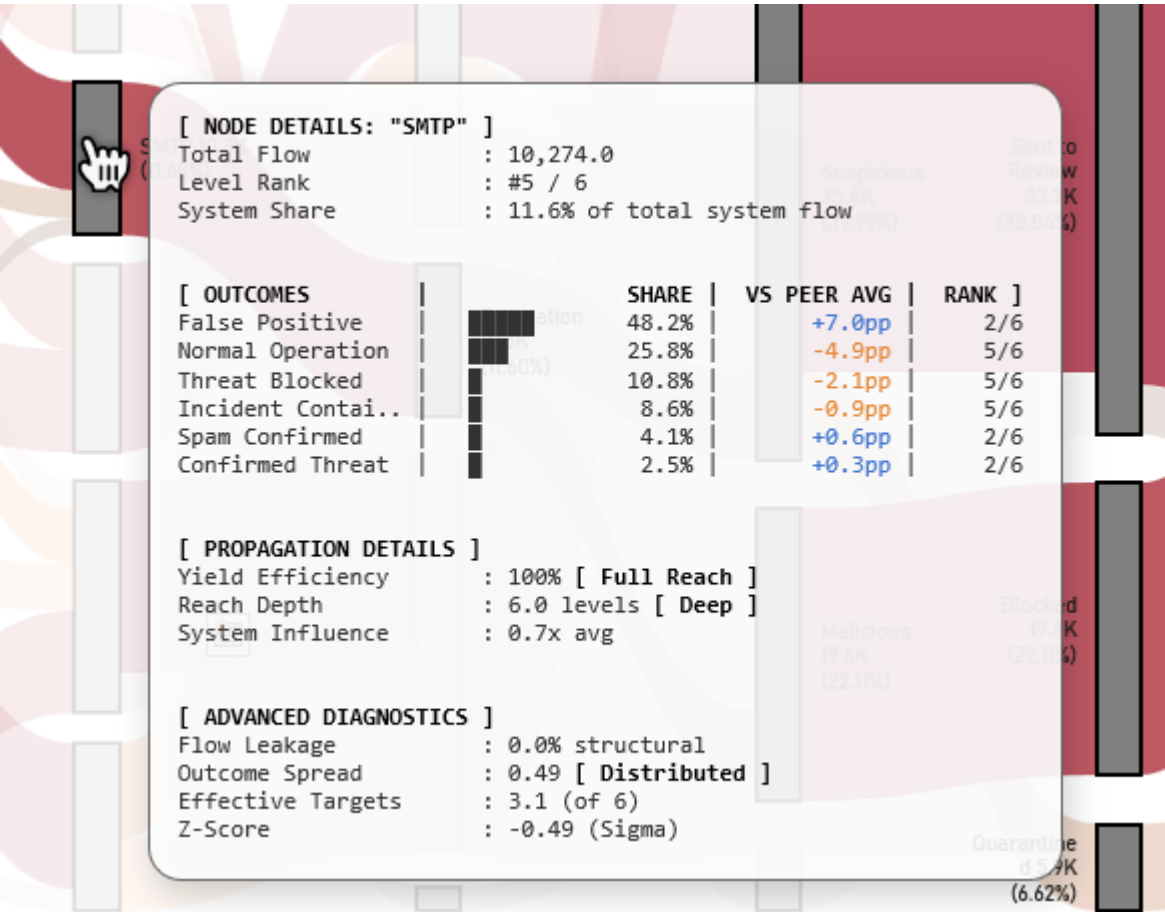


Business view:

In Mode 2, the [OUTCOMES] section serves as your strategic anchor. It bypasses intermediate complexity to reveal the final "**Bottom Line**" of any selected flow.

- **Terminal Attribution:** Quantifies the ultimate result of a specific node. For example, the engine reveals that **48.2%** of the flow from the selected "SMTP" node eventually terminates as a "**False Positive**".
- **Performance Benchmarking:** Outcomes are automatically measured against the **Peer Average (Vs Peer Avg)** to identify systemic deviations.
- **Actionable Insight:** Identifying that a node produces **+7.0pp** more False Positives than its peers indicates that local configurations (e.g., SMTP filtering) are likely too aggressive or misaligned with organizational standards.

Extended view:



The [ADVANCED DIAGNOSTICS] block provides forensic-level validation of the data model, ensuring that predictive simulations are grounded in mathematical certainty.

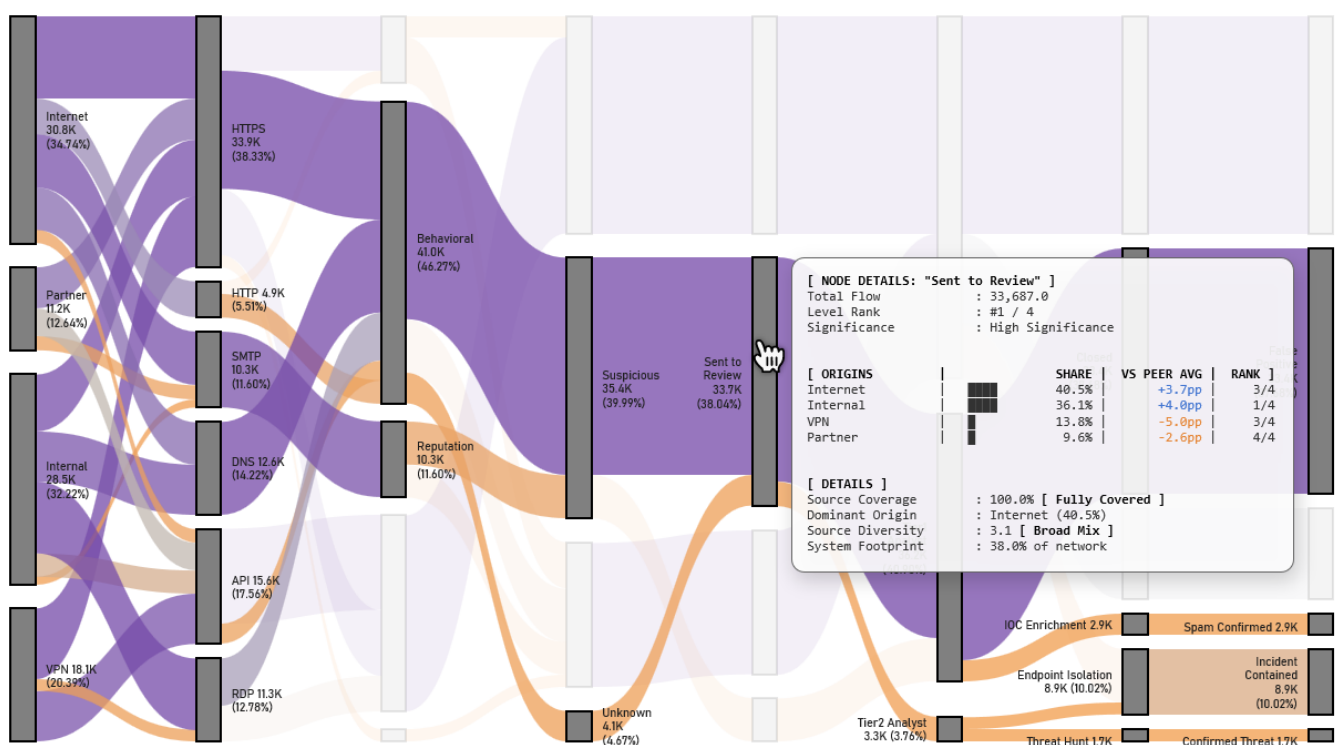
- **Systemic Integrity (Flow Leakage):** A **0.0% structural leakage** status guarantees that despite downstream complexity, the engine has accounted for 100% of the units. This eliminates "data black holes" and confirms the absolute integrity of the underlying logic.
- **Impact Diversity (Outcome Spread):** Quantifies the breadth of a node's systemic influence. A **0.49 [Distributed]** rating indicates that the node impacts multiple result categories, signifying a broad operational footprint rather than an isolated effect.
- **Strategic Focus (Effective Targets):** The engine applies mathematical weighting to identify meaningful impact across all possible outcomes. A value of **3.1 (of 6)** allows leadership to ignore statistical noise and focus exclusively on the primary result drivers.
- **Operational Baseline (Z-Score):** Indicates the statistical "normality" of the node's behavior. A value of **-0.49 Sigma** confirms that the node is operating within the expected parameters of the system, providing a baseline for stable performance.

Strategic Value: ROI & Risk Validation Mode 2 is the ultimate tool for pre-deployment validation. Use this view to quantify how planned interventions - such as tightening security policies or optimizing supply chain routes - will propagate to **final margins** or **risk scores** before any changes are deployed.

Mode 3: Upstream Origin (The Attribution View)

Mode 3 functions as a dedicated **Root Cause** engine. It performs a reverse-traversal of the entire system to answer the critical question: "Where did this actually start?".

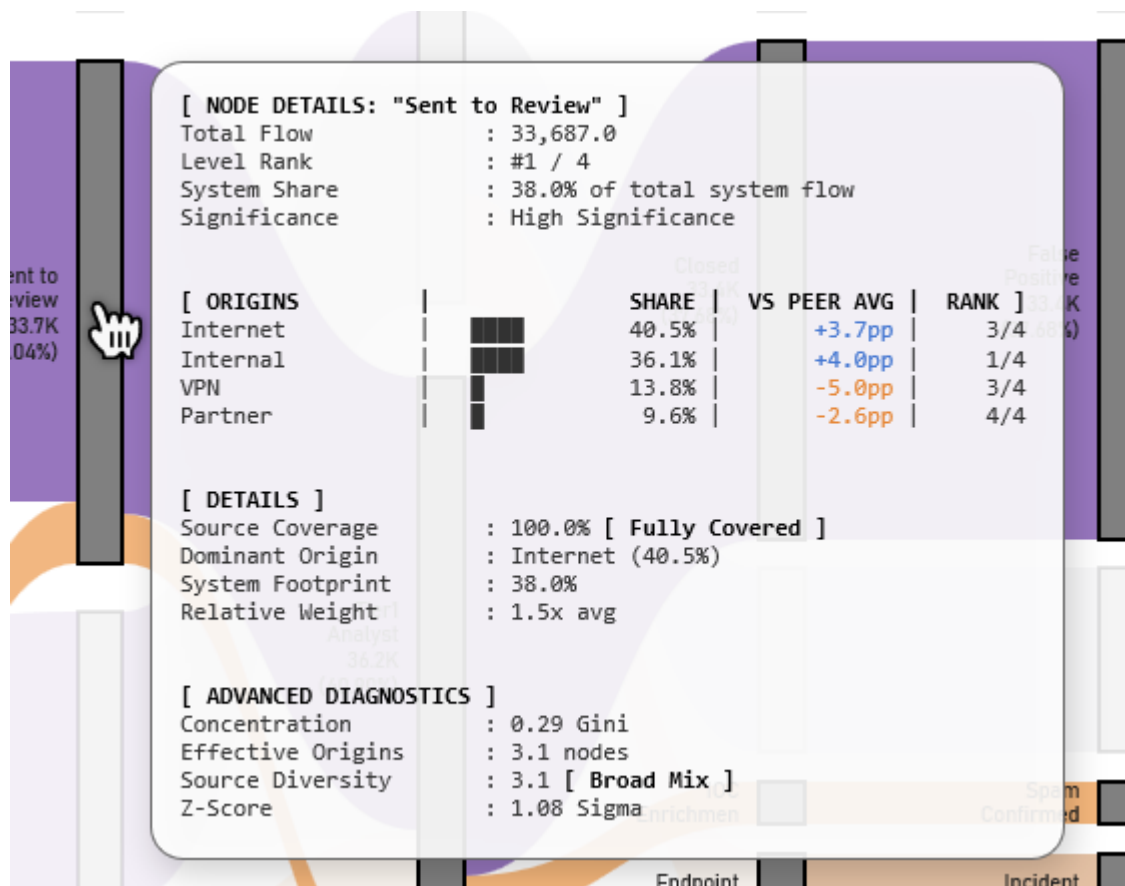
- **The Strategic Goal:** To provide absolute traceability by mapping any outcome or state back to its system-wide origins.
- **Analytical Capability:** Using real-time graph traversal, the engine calculates **Upstream Footprints** and **Origin Concentration**, delivering definitive attribution for any selected point.
- **Operational Applications:** **Sustainability:** Trace a final product's carbon footprint back to its primary energy sources. **Procurement:** Deconstruct complex cost structures to identify the primary drivers of price volatility.



The **[ORIGINS]** section identifies the primary sources feeding a selected node, stripping away systemic noise to provide absolute provenance.

- **Source Attribution:** The engine delivers high-resolution traceability for any outcome. In the "Sent to Review" example, it identifies that **40.5%** of the flow originates from the Internet, while **36.1%** is Internal.
- **Peer Ranking (Comparative Benchmarking):** The system automatically validates if a specific attribution profile is within normal parameters.
 - **Insight:** Identifying that the Internal share is **+4.0pp higher** than the peer average (ranked **#1/4**) reveals that internal triggers are disproportionately inflating the review workload compared to similar stages.
- **Audit-Ready Traceability (Source Coverage):** A **100.0% [Fully Covered]** status guarantees that every single unit has been successfully traced back to a root source. This ensures there is no "anonymous" or unaccounted-for traffic in your strategic reporting.

Extended view:



The [ADVANCED DIAGNOSTICS] block quantifies the systemic nature of a node's attribution profile, moving deep-dive investigations from speculation to mathematical certainty.

- **Source Concentration (0.29 Gini):** Measures the distribution of contributing origins. A low Gini score of **0.29** confirms that the status is fed by a **broad mix** of sources rather than a single "bad actor" or outlier.
- **Strategic Prioritization (3.1 Effective Origins):** Although multiple origin categories may exist, the engine calculates that the meaningful mathematical weight effectively comes from **3.1 sources**. This allows leadership to prioritize investigations on the specific channels that actually drive the outcome.
- **Systemic Junction Load (1.5x avg):** Indicates that the selected node handles **1.5 times more mass** than the average junction in its layer. This identifies the node as a critical junction for systemic monitoring due to its disproportionate impact on the network.
- **Stability Verification (1.08 Sigma):** A statistical significance check of the upstream attribution profile. A **1.08 Sigma** indicates that while the node is highly active, its behavior remains within a statistically "safe" and expected range.

Mode 3 serves as the ultimate "fact-checker" for organizational performance claims. When bottlenecks or risks are attributed to "external factors," the Attribution View provides the evidence required to trace the flow back to its true origin - transforming finger-pointing into fact-based problem solving.

Modular Architecture & Customization

The SankeyEngine is designed to evolve alongside your organizational complexity. Our modular framework allows for the rapid integration of proprietary logic, ensuring the tool mirrors your specific operational DNA rather than forcing you into a "one-size-fits-all" box.

- **Custom Performance Logic:** Implement unique KPIs, specific performance metrics, or proprietary cost-allocation rules as a tailored logic layer. We build your specific business rules directly into the engine's processing core.
- **Rapid Domain Adaptation:** Whether your data involves complex financial flows, or multi-vector energy systems, the engine adapts to diverse industry standards within a remarkably short development cycle.
- **Scalable Intelligence:** New diagnostic panels and specialized analytical "Views" can be integrated seamlessly without altering the core stability of the system, allowing for continuous functional growth.

Enterprise-Grade Architecture

We understand that in high-stakes environments, the "how" is just as important as the "what." Our architecture is built on three non-negotiable pillars:

- **Zero-Install (Portable Native Technology):** The engine utilizes high-performance native technology that requires **no administrative privileges** and no installation. It is instantly deployable even in the most "locked-down" corporate IT environments.
- **Absolute Data Sovereignty:** Experience **100% offline execution** within Excel. Your proprietary data never leaves your local environment. With **no cloud dependency, no telemetry, and no external leaks**, we provide the air-gapped security required by the banking, defense, and healthcare sectors.
- **Deterministic Precision:** Every graph traversal is strictly validated before visualization. What you see is not a "visual approximation," but a **100% mathematically accurate, audit-ready reflection** of your underlying data model.

Contact & Legal Information Visual Analytics Ltd. | 7 Bell Yard, London, WC2A 2JR | contact@chartengine.io

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