



Payments Industry 301

TSG EDUCATION SERIES

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PREVIEW

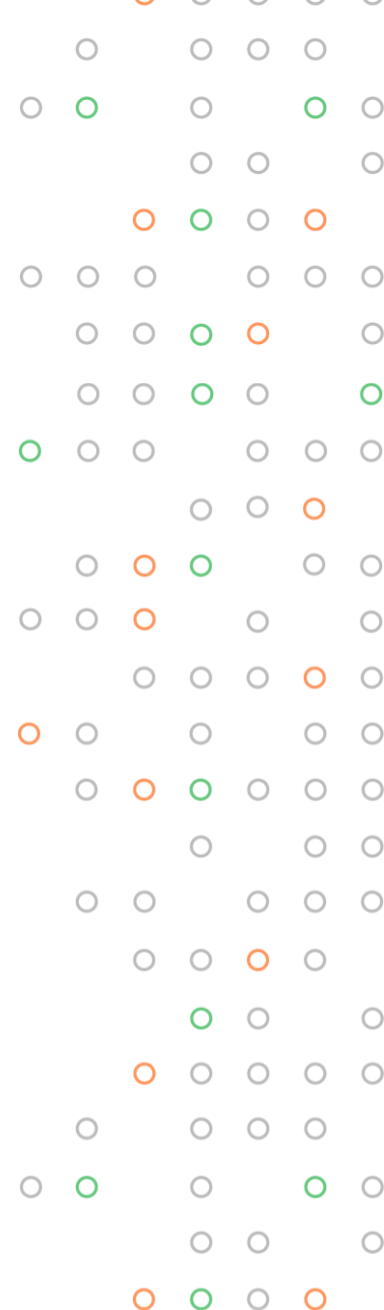
TSG (The Strawhecker Group) is a globally recognized analytics and consulting firm that supports the entire payments ecosystem, serving over 1,000 clients from Fortune 500 leaders to dozens of the world's most valuable brands. Trusted by industry leaders, TSG's strategic services, market intelligence, and analytics merge to empower clients with actionable and accessible information.

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TSG Payments Industry Education Series – **PREVIEW**

TSG's Payments Industry Education Series offers an introductory overview of the core principles of the payments ecosystem, current trends, and future developments. Reports include Payments 101, 201, and 301.

Payments 301 dives deeper into the payments industry, exploring new and emerging concepts shaping the future of the industry including embedded finance; stablecoins and CBDCs; Artificial Intelligence (AI) and Machine Learning (ML).

This report is designed for payments professionals who have an existing understanding of the basics and foundational knowledge of real-world payment applications who are now looking to expand their depth of knowledge to up-and-coming technologies.



The Future of Payments – PREVIEW

Connecting rails through orchestration

NETWORK OF NETWORKS

The move toward interoperability creates a payments landscape that is more unified but not monopolistic. It reduces fragmentation and enables competition between rails while giving participants flexibility in how they move value.

For financial institutions, it means upgrading systems to handle ISO 20022 and participate in multi-rail orchestration. For processors and networks, it requires ensuring their platforms can translate and route messages consistently across systems. For fintechs and platforms, interoperability unlocks intelligent routing and new product opportunities built on top of multiple rails. For merchants, it promises richer remittance data and more reliable reconciliation. Collectively, interoperability reshapes the economics of payments by allowing money to move on the most efficient path available.

ORCHESTRATION LAYER

The orchestration layer is middleware that connects merchants, platforms, and payment networks. Instead of each party building direct connections into every rail, orchestration centralizes the work of routing, translation, and compliance.

WHAT IT DOES:

- Consolidates services like routing, retries, fraud screening, compliance checks, and reporting into one unified layer.

HOW IT WORKS:

- Evaluates each transaction against factors like cost, speed, geography, and risk, then routes it through the most efficient rail.
- Translates between native message formats and ISO20022 when needed.

WHY IT MATTERS:

- Reduces redundancy for merchants and platforms, enables intelligent multi-rail payments, and helps create a true “network of networks” where value moves seamlessly across systems.

The orchestration layer is the “brains” of interoperability, making intelligent decisions about how payments flow.

Payment Innovations – **PREVIEW**

Replacing static data with dynamic, secure credentials

CARDLESS SECURITY

Cardless security replaces static card numbers and passwords with tokenization and biometrics. Together, they protect sensitive payment data, reduce fraud, and enable frictionless, often invisible, transactions across devices and platforms.

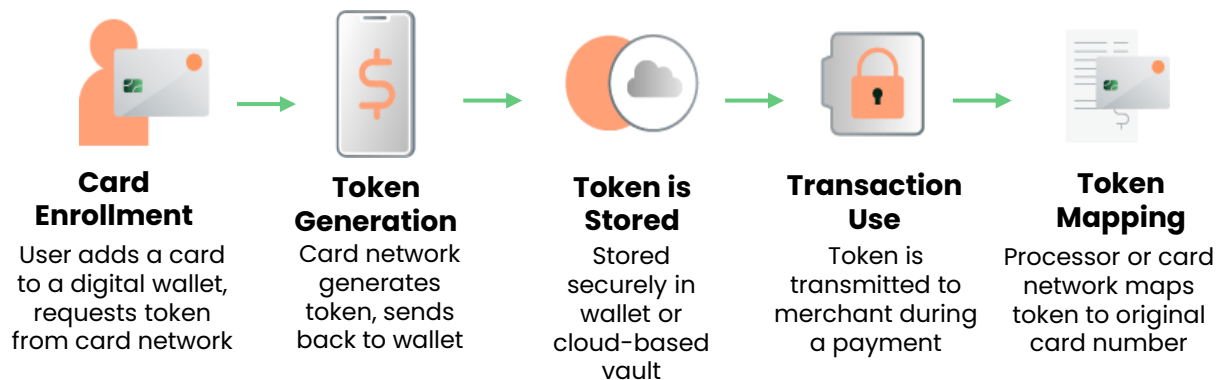
Examples

-  • Mobile Wallets
-  • Embedded payments in apps
-  • Wearables and connected devices

Tokenization

Tokenization refers to the process of replacing sensitive payment information like a credit card number with a unique, randomly generated identifier called a token. This token can be used to authorize payments without exposing the actual card details, enhancing security and reducing fraud risk.

In Network Tokenization the card networks manage and generate the token vault. This model ensures interoperability anywhere the underlying card brand is accepted.



Biometric

Fingerprint, face, or iris recognition adds a strong layer of protection. Biometrics reduce reliance on passwords or PINs and prevent unauthorized use if a device is lost or stolen. Biometric data is usually stored locally on the device, reducing exposure to breaches.

Embedded Finance – PREVIEW

The rise of embedded finance expands access to banking services and challenge traditional banks to adapt

WHY EMBEDDED FINANCE MATTERS



Shifts Control from Banks to Platforms

Financial services are distributed by platforms (e.g., Shopify, Uber) rather than banks, shifting ownership and loyalty of the customer relationship.



Expands Access to Financial Services

Nontraditional platforms can extend banking, lending, and insurance to underbanked communities or individual users who may not qualify through traditional channels.



Creates Seamless Customer Experience

Customers increasingly expects payments, insurance, and lending to be invisible and embedded at the point of need, without being redirected to a bank.



New Business Models for Platforms

Embedded finance enables platforms to diversify revenue by adding financial services alongside core offerings, creating "platform-as-a-bank" ecosystems.



Implications for Banks

Traditional banks risk being bypassed as platforms take over the front end. To stay relevant, they must partner with platforms or build embedded capabilities themselves.

Blockchain & CBDCS – **PREVIEW**

Reaching consensus through distributed participants

HOW CONSENSUS WORKS

Consensus is the process blockchains use to get thousands of independent computers to agree on a single version of the ledger. Instead of one central authority, the network itself enforces trust by having participants follow shared rules for proposing and validating blocks.

Nodes are the participants in this process. Some just keep a copy of the ledger, but others actively take part in consensus by proposing blocks or checking those proposed by others. By spreading these roles across many independent actors, blockchains ensure no single party controls the record.

There are different ways to pick which node gets to propose the next block – Proof of Work and Proof of Stake:

Proof of Work

In Proof of Work (PoW), miners compete by solving cryptographic puzzles. The first to succeed earns the right to propose the next block, which other nodes then verify. This makes cheating impractical because rewriting history would require enormous computing resources. The tradeoff is security through energy use, which makes PoW slow and expensive.



Proof of Stake

In Proof of Stake (PoS), validators lock up cryptocurrency as collateral. The protocol selects one to propose the next block (weighted by stake), and others check it. If the majority agree, the block is added. Security comes from incentives: honest validators earn rewards, while dishonest ones risk losing their stake.



AI & Machine Learning – PREVIEW

Revolutionizing pricing strategies with predictive optimization

AI enhances pricing by turning previously fragmented, manual tasks into a unified, data-driven process. Instead of teams combing through merchant statements, reconciling fee schedules, and running competitive analyses by hand, machine learning models can handle the volume and complexity in real time. This allows providers to spot anomalies earlier and act on opportunities that would otherwise be hidden in the noise, ultimately making pricing more efficient and more strategic.



Auto Analysis of Merchant Statements

Machine learning tools can automatically review merchant statements, sorting and interpreting data quickly and accurately. These systems identify fee patterns, flag anomalies, and generate reports that improve transparency and help businesses manage costs. By reducing manual reviews, these tools make reconciliation more accurate, efficient, and affordable.

Example: Ledge uses AI to automatically reconcile and analyze merchant statements, flagging anomalies and reducing manual review.

Smart Pricing Strategy

Smart pricing tools can suggest the best pricing package for a merchant based on their profile and the service provider's margin goals. They can pull competitor pricing from public sources and analyze uploaded merchant statements to estimate margins, uncover hidden fees, and benchmark pricing models.

Example: While most applications are proprietary, acquirers and large PSPs are experimenting with AI to surface underpriced merchants and recommend new fee structures.

Portfolio Pricing Initiative Support

ML-powered portfolio management tools can surface underpriced merchants, flag high-cost or downgrading accounts, and detect margin erosion. They can also suggest new fee structures or volume-based incentives, helping providers keep pricing competitive and margins healthy across the portfolio.

Example: Airbnb applies machine learning to adjust prices dynamically based on demand, seasonality, and customer behavior. Payments providers are beginning to explore similar models.

Fee Cleanup & Alignment During M&A Conversations

AI-powered fee cleanup tools can automate the process of aligning disparate fee structures during M&A. By analyzing the acquired portfolio's fee schedules, these systems can suggest best-fit categories that map to the acquiring party's model. This reduces manual review, speeds up integration, and helps Finance preserve profitability while simplifying portfolio alignment.

Example: Public details are limited, but large-scale mergers are likely to involve AI-driven analysis to align redundant fee structures.



TSG is a fast-growing analytics and consulting firm. The company serves the entire payments ecosystem, from fintech startups to Fortune 500 companies. The firm provides its clients with advisory services, research and analytics to help them plan and execute their strategic initiatives. Based in Omaha, a recognized payments industry hub, TSG is an established leader in this high-growth, ever-evolving space.



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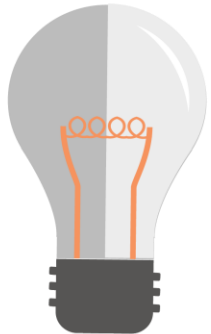
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