Future of Payments

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Dear reader,

Welcome to this, the inaugural edition of the Projective Group Institute's new Journal of Financial Services!

We're very excited to be launching our Journal at a time of immense challenge and change for the financial services industry, and we've drawn upon the deep subject matter expertise of the many renowned contributors to this edition of the Journal to bring you what we hope you'll find to be a highly stimulating series of articles.

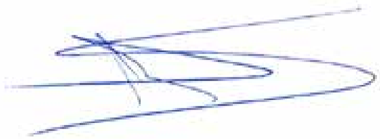
We'll be publishing editions of the Journal on a regular basis, and each time we will be focusing on those topics our Advisory Board members, who are leading academics and executives, are telling us are of key strategic importance to them. And it's for that reason that we've chosen to focus this edition on the world of Payments.

Payments has gone from being an often-overlooked, quite slow-changing, typically back-office, function to becoming one of the most transformed - and transformative – functions in the financial services industry. And all of that has happened within the space of only a few years. Digitization, cloud native technology, financial crime and fraud, artificial intelligence, and many other recent developments, combined with ever-greater regulatory scrutiny and ever-increasing client expectations, have created the perfect storm for legacy Payments providers and have opened this area up to newer and more agile competitors.

We focus on the drivers of that transformation, the implications of those drivers for the various players in the Payments value-chain, and the key decision points firms will therefore soon face if they intend to remain leaders in this field.

I'm conscious that in creating the articles in this Journal, many individuals have spent many hours researching and writing, and I'm very grateful for their time and expertise!

I look forward to getting your feedback on our new Journal of Financial Services, and to speaking with you again soon.



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Future of Payments

The future operating model for Payments

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ABSTRACT

Artificial Intelligence (AI) is reshaping financial services operations in ways most banks had not anticipated. This new technology will allow smaller, nimbler competitors to take on the more established players and provide faster, cheaper and more efficient payments services. Major banking institutions are responding to this challenge by investing significant sums in this new technology. However, the focus, at least at this stage, seems to be predominantly on how the technologies can be used to improve certain aspects of the value chain, such as increasing personalization and speed and reducing human intervention and errors, rather than on the overall infrastructure upon which the entire business model is built. This article aims to change the dialogue and focus the attention of the leaders of banking institutions to establish the kind of payments operating model that will not only allow AI, and its derivative technologies, to be utilized, but will place it as part of the foundation upon which the operating model is based.

1. Introduction

Artificial Intelligence (AI) and Generative AI (GenAI) are transforming our lives in ways that concern even their creators. Those changes are so significant that even those who are their advocates have suggested that regulators must somehow find ways to provide guardrails around them to prevent them from destroying humanity [Hern (2023)]. The founders of such technologies are not alone in being concerned about their potential implications for humanity: regulators and policymakers the world over are looking at the ways in which these new technologies might impact the future, and their own citizens specifically, and at how they should react, with the European Union being among the first movers [E.U. (2023)].

The implications are severe, with some anticipating massive job losses in many sectors, which would have implications far beyond mere economics [GS (2023)]. Recent assessments have become more measured, with some questioning whether the new technologies are as devastating – or alternatively as useful - as some had thought [Marcus (2025)]. Even skeptics acknowledge that AI will be transformational, if not actually developing as quickly as many had thought or be as concerning as many had feared.

Whether AI delivers on all its promises or not, it is already changing how businesses operate and meeting growing client needs without it will become impossible. Like mobile banking, AI and GenAI are becoming need-to-have rather than good-to-have. All businesses that wish to remain in the competition will need to find ways to successfully integrate them within their business strategies. And financial services is no exception, with investments of in excess of U.S.$125 billion expected from this sector by 2028 [Statista (2025a)].

AI is transforming finance across multiple areas, with some expecting it to take over from how a client is serviced all the way through to how investments are selected and managed. That transformation is already underway, with numerous Wealth Management companies already applying AI in different parts of their value chains [Weaver (2025)]. While certain aspects of the value chain currently demand human intervention, these will increasingly be automated as AI develops.

One of the areas in financial services that has been most impacted by this new technology is payments, with the old order being completely upended by newcomers. The new FinTech players have used the power of online and mobile technologies to force banks to change how they operate and what they charge.

AI will be even more transformative in payments operations. While most attention focuses on how AI will change client service and the payments business, few have examined how the operations that support these services must be modified to keep pace.

The banks we work with are struggling to incorporate AI's power into their businesses, but without spending the time necessary to think about just how transformative this could be. This explains why AI implementations are falling short of expectations. The focus of this article is on how AI will help shape the future operating model of tomorrow's payments leaders. It is the operations behind the services that will ensure clients experience a seamless process, and that is where the real competitive advantage lies.

This article examines how AI will impact payment operations, and focuses on the operational excellence necessary to make the industry's transformation a reality.

2. How AI will impact payments

AI is transforming payment operations across many areas, but the three drawing the most executive attention are fraud detection, new payment methods, and improving the payment process itself. While not exhaustive, these three represent the most common AI applications that executives are considering.

2.1 Fraud detection and prevention

Fraud detection models, which have typically been reliant on historical patterns and have, therefore, missed changes in the status of counterparties, have not been as effective as needed, predominantly because the technology evolved for both attacker and defender, and the costs and impacts tended to be asymmetric. AI models have improved the process somewhat by allowing banks to detect suspicious activities in real time, but even this has not been totally effective, with online payment fraud surpassing U.S.$44.3 bln in 2024 [Statista (2025b)].

The challenges caused by autonomous AI agents

Autonomous AI agents are tools that are permitted by individuals or organizations to make purchasing, payment, and investing decisions on their behalf. The challenge these agents cause is that determination of their authenticity by the tools available today is not easy, since authentication and payments infrastructures as a whole are built with the human counterpart in mind. Payment providers must ask themselves: "how will they develop their tools to deal with AI agents representing individuals who are now hidden behind them?"

GenAI promises to improve current AI models by allowing fraud data to be queried in natural language and assist with pattern creation and recognition, which should help mitigate false declines as well as fraud itself.

How GenAI will perform in practice remains to be seen, but its credentials certainly seem more promising than its AI predecessors.

2.2 New payment methods

While AI-powered personalization is not new and has been applied effectively across industries, payments is only now becoming a beneficiary. Beyond enabling banks to develop new products and services based on reliable client data, AI is advancing major new technologies such as biometric payments, face-pay, and voice-activated payments. As an increasing number of airline passengers have become accustomed to using so-called "smart gates" to avoid long airport queues, they are beginning to ask why such technologies are not available to them when paying for goods and services.

Technology companies are providing these payment capabilities, with Apple and the Ant Group, the parent company of Alipay, being among the most well-known. Such payment methods are already prevalent and well-developed in countries like China.

Regulations such as Europe's GDPR make biometric technology applications more complex, but this challenge is being overcome. The future looks promising when established banking giants like JPMorgan are helping clients "pay by smile"! [J.P. Morgan (2024)].

2.2.1 Emerging payment instruments

Digital payment rails are fundamentally different from the rails that banks operate today. Stablecoins backed by regulated reserves, wholesale and retail central-bank digital currencies (CBDCs), tokenized deposit coins, and on-chain repo networks deliver sub-second finality and 24 × 7 liquidity. Cross-border projects like BIS Nexus, mBridge, and the Regulated Liability Network bypass correspondent banking chains entirely. These instruments introduce two design variables that legacy workflows cannot handle: programmability where logic executes with the payment and atomic settlement across jurisdictions.

AI makes these new payment instruments practical at enterprise scale. Machine-learning models predict liquidity demand across tokenized and fiat pools, routing flows to the cheapest rail in real time. Natural-language agents convert heterogeneous smart-contract terms into human-readable controls for Operations and Audit. Anomaly-detection engines identify behavioral outliers in CBDC ledgers hours before rule-based monitors would react. AI-driven orchestration abstracts Treasurers and Product Managers from rail selection completely: the system decides when to use a stablecoin bridge, when to stay on RTGS, or when to trigger an FX-dematerialized swap under unified governance.

In short, while digital currencies provide new opportunities, operationalization of them into client products presents a series of challenges. Establishing a technology stack brings costs, risks, and other complexities. AI provides the operational intelligence to bring the opportunities to market safely and profitably.

2.3 Payment process improvements

The most expensive, yet at the same time most valuable, asset of any financial institution is the time of its expert staff. AI becomes valuable when it helps staff avoid wasting their time on non-revenue generating and repetitive tasks and is expected to deliver exactly that benefit.

In payments, AI helps bank employees spend less time reviewing and approving payments and more time providing better, value-generating services for clients and the banks themselves. Consider the current processes that a simple international money transfer must navigate to reach its destination – AI and other new technologies can streamline every step.

Banks' payments teams can already share payment behaviors with client-facing advisors to help them sell other products that are better suited to their clients' needs, including loans, investments, and cards. GenAI makes those recommendations even more personalized.

These capabilities are moving up the value chain to include AI identifying the most efficient transfer/payments channel and make the approval process become less human-intensive and more frictionless. Clients can be confident in the knowledge that the fastest, safest, cheapest, and most efficient, route will be chosen for their payment, irrespective of the communication method used.

Access to these technologies also reduces error rates, including ensuring that transactions adhere to the latest regulations. Clients rarely praise a bank when all is running smoothly; it is only when a simple error causes issues that they make their opinions known. AI mitigates that risk.

Just as the internet helped FinTech/InsurTech companies compete in areas previously dominated by major global financial services organizations, AI will fuel a competition boom between established players and newcomers. Many of these newcomers could become white label service providers for established banking institutions that do not want to make the investments in their infrastructure necessary to compete actively. Regardless of how the future industry landscape develops, AI will have transformed it.

The history of online and mobile banking shows that global banking institutions will continue to make their own investments in AI, attempting to maintain their competitive advantage against their peers, but many of these efforts will prove insufficient.

The question is not whether AI will transform payments services delivery by major banking institutions and their nimbler smaller competitors - it is whether enough thought has gone into planning and executing this transformation and what the anticipated future payments operating model will look like.

3. Operationalization of AI in payments

These benefits will significantly impact client service, and clients will feel the impact of the application of the new technologies on their payments journeys. But the established players often overlook a critical issue and risk replicating the same mistake they made during the FinTech boom by applying new technology where possible without rebuilding their operations to benefit fully from it.

The FinTech revolution offers a cautionary tale about what is coming, not only in payments but across banking more broadly.

When online and mobile banking became possible, more established players tried to apply these new technologies to their legacy systems. They invested vast sums of money on transformation programs, which typically meant adding a middle-ware layer on top of their legacy systems. This new layer allowed banks to integrate online and mobile technologies with their core back-end banking systems, but it left those legacy systems intact.

Anyone who has worked in banks or helped with their transformation initiatives knows just how rigid, siloed, and expensive legacy systems are.

The operational challenges these legacy systems created in payments include what most of us still experience: high exception rates, limited straight-through processing (STP) via domestic and cross-border rails, and poor end-to-end visibility and root cause traceability.

The alternative was to replicate what the FinTechs did: rebuilding entire operations from scratch with the new technologies in mind. This approach allowed FinTechs to be significantly more flexible as the technologies improved and to generate client-centric cultures based on the new technologies. But, most of the major established payments providers did not pursue this option during the FinTech revolution, as is evident today.

Few would deny that FinTechs created niches that established players found difficult or impossible to penetrate, regardless of one's view of FinTech valuations.

The challenge is that these nimbler players' success stems as much from their mind-sets as the core technologies they use. Numerous established players have created their own FinTechs, only to close them down. These include examples in payments, with HSBC deciding to close its payments app Zing within its first year of operation: Zing's failure had little to do with the underlying technology and instead reflected a misunderstanding about networked business.

What is needed is not a separate entity applying new technologies, but a complete overhaul of legacy systems and a change in the mindset of the people working in these banks.

Generating the benefits highlighted in Section 2 is worthwhile. But the possibilities that AI and its derivatives could create will be significantly greater than those coming from merely applying these technologies ad-hoc.

AI must be applied in the "hard" areas of banking and payments - payment processing, reconciliation, compliance operations, STP, exception handling, and liquidity forecasting - for established players to derive full benefits.

Redesigning entire payments operations with AI at their core will not be easy or cheap, but banks will realize it is necessary. Established players cannot keep trimming the edges and expecting different outcomes. New players will eventually take away not only loss-making clients, but profitable ones too - and it might be too late for established players to respond.

Many banking giants are in the same place they occupied in the 2010s when challenger institutions emerged. Those nimbler tech-savvy competitors established themselves with new technologies at their core and significantly impacted the industry. We believe the AI revolution will cause several established banks to disappear.

Banks face the same choice again. Invest in large transformational projects that will apply new technologies only to "soft" parts of their businesses, or put AI at the core of their operations. The decision depends on their investment appetite, capability maturity to execute on their vision, and risk tolerance.

The next few years will be fascinating as established players compete with a new group of digital, AI-enabled competitors.

Should banks make the necessary investments, AI could serve as a real-time orchestration engine, predictive decision layer, and execution support framework, across the entire payments value chain.

3.1 Core areas where AI could be embedded structurally

As banks modernize their payments systems, static rules and batch processes are no longer sufficient. AI does not just add horsepower, it changes how decisions get made, how exceptions are resolved, and how systems respond in real time to pressure, competition, and regulation. This section outlines key structural domains where AI enables sustainable competitive advantage, not just automation.

3.1.1 Payment operations

Payment flows are too complex for rigid workflows. Multi-rail networks, shifting formats like ISO 20022, and rising expectations for instant resolution, are stretching traditional systems. AI can intervene upstream, validating, repairing and routing, without requiring armies of analysts. More importantly, it shifts processing from best efforts to context-aware optimization, where systems understand what is happening and act accordingly. AI's ability to learn from historical patterns to detect anomalies, using those patterns to dynamically make corrections and continuously optimize routes, will transform payment provider operations (Table 1a).

3.1.2 Risk, compliance, and regulatory oversight

Rules-based controls struggle when the rules change faster than the systems. Static lists cannot catch dynamic risks. AI closes that gap by learning behavioral patterns, flagging anomalies early, and reducing false positives. This is critical with cross-border exposure and richer data formats under ISO 20022. Gartner (2023) highlights AI's utility in AML and fraud detection, where model-based approaches outperform static thresholds.

AI's ability to use behavioral models to identify evolving risk beyond encoded logic, reduce false positives and improve accuracy using contextual scoring, and undertake real-time conformity checks and breach predictions, will make AI an essential tool for any payments provider serious about risk and compliance (Table 1b).

3.1.3 Treasury and liquidity management

Real-time payments and market volatility break legacy liquidity models, especially when cash is fragmented across systems and legal entities. AI forecasts based on live flows, not lagging reports. It also automates margin, funding and exposure

Table 1: Comparison of traditional and AI-enhanced approaches

Function	Traditional approach	AI-enhanced approach
a: Payment operations		
Error detection and enrichment	Basic field validation and static lookups (e.g., IBAN-to-BIC)	AI learns from historical patterns to detect anomalies and enrich contextually in real time
Smart repair of rejected transactions	Pre-defined correction rules	AI predicts likely causes and dynamically corrects based on prior outcomes
Adaptive routing (fee, FX, failure likelihood)	Static logic trees or fixed rules	AI continuously optimizes routes based on live fee, risk, and SLA data
b: Risk and compliance		
Anomaly detection	Rules-based thresholds and alerts	Behavioral models surface evolving risks beyond encoded logic
Sanctions screening and risk scoring	Static list and geography filters	Contextual scoring reduces false positives and improves precision
SLA tracking and ISO 20022 monitoring	Manual reconciliation post-fact	Real-time conformity checks and breach prediction
c: Treasury and liquidity management		
Intraday liquidity forecasting	EOD balances or regression models	AI learns from real-time flow to update intra-day predictions
Parsing statements and agreements	Regex or RPA over structured docs	NLP parses unstructured inputs with context
Margin/collateral alerts	Static thresholds and daily checks	Event-based alerts triggered by live shifts in exposure
d: Servicing and workflow automation		
Triage of ops issues	Severity codes and static queues	Dynamic prioritization by root cause and urgency
Support summaries	Rule-based templates	Natural language summaries improve speed and clarity
Workflow optimization	Periodic reviews	Continuous analysis recommends changes based on throughput and error
e: Data intelligence and decision support		
KPI and trend analysis	Manual BI dashboards	AI identifies cross-signal trends, suggests actions
Decision support	Static spreadsheets	AI assistants answer ad hoc queries and simulate scenarios
Signal synthesis	Siloed tooling	Multimodal models merge ops, customer, and finance data

checks across messy, partial, data sets. McKinsey (2022) suggests that machine learning could improve liquidity predictions by double-digit margins in high-volume environments.

AI's ability to learn from real-time flows to update intra-day predictions, use Natural Language Processing (NLP) to parse unstructured inputs with context, and trigger event-based alerts based on live shifts in exposure, will profoundly impact on how payments providers manage liquidity (Table 1c).

3.1.4 Servicing and workflow automation

The biggest drag on payments processing is not systems but the human-to-human handoffs that slow everything down. Exceptions, escalations, and follow-ups can inundate Support teams. AI reduces that load by triaging issues, generating summaries, and surfacing true root causes. The goal is not to remove people, but to reduce the noise they waste their time on. BCG (2023) shows real-world deployments at tier-1 banks delivering up to 30% reduction in support tickets after deploying AI triage systems.

AI achieves this by prioritizing dynamically by root cause and urgency, using NLP summaries to improve speed and clarity and make recommendations based on continuous analysis of throughput and error (Table 1d).

3.1.5 Data intelligence and decision support

It is not always about faster execution, but better decisions. Operations and Product teams often have data but lack clarity. AI links signals, flags root causes, and answers 'why?' without needing a Data Scientist in every room. The shift is from dashboards to dialogue: systems that tell you what is going wrong and what to do about it.

AI allows payments providers to replace manual business intelligence dashboards with capabilities that identify cross-signal trends and make actionable suggestions. Static spreadsheets and siloed tooling can be replaced by assistants that respond to ad-hoc queries and multimodal models that merge operational, client, and financial data (Table 1e).

3.2 Risks and limitations of AI in payments operations

While AI adds power, it also introduces new risk classes. Unlike deterministic systems, AI operates probabilistically, which increases agility but reduces predictability. In financial operations this tradeoff that must be governed tightly.

Payment providers need to understand these trade-offs:

- → **Hallucination and model uncertainty**: generative models sometimes return plausible sounding but incorrect outputs. In payments, this could mean false field mappings or misinterpreted regulations. No unsupervised AI should operate in a control-critical function without layered verification.
- → **Opaque decision-making**: black-box models cannot easily explain themselves. If a routing engine or fraud filter behaves unexpectedly it erodes trust and may breach compliance requirements around explainability [FCA (2024)].
- → **Data sensitivity and leakage**: broad data ingestion[1] means exposure. Without strong redaction and data isolation, sensitive information can leak, especially when integrating third-party models. Regulators such as the European Banking Authority [EBA (2024)] have expressed concerns about this issue and published guidelines for managing emerging AI risk.
- → **Skill gaps and over-reliance**: teams may over-trust outputs or under-question results. AI becomes a risk if staff are not trained to challenge or correct it. Training in prompt design, model behavior, and override protocols, is essential.
- → **Regulatory ambiguity and model risk**: model risk frameworks are evolving rapidly. Some AI tools will be reclassified as material models, requiring the same validation and oversight as credit or pricing models. The European Central Bank (ECB) and the Prudential Regulatory Authority (PRA) are expected to tighten expectations.

1. According to Tim Mucci of IBM: "Data ingestion is the process of collecting and importing data files from various sources into a database for storage, processing and analysis. The goal of data ingestion is to clean and store data in an accessible and consistent central repository to prepare it for use within the organization." https://tinyurl.com/y4pj6jnk

Table 2: Model classification and risk tiering

Tier	Characteristics	Use-cases	Controls
Tier 1: Critical	Client-facing or regulatory exposure	Routing logic, sanctions, fraud	Full validation, live monitoring, SME sign-off
Tier 2: Material	Supports decisions, not sole source	Liquidity forecasting, repair recommendations	Human-in-the-loop, traceability
Tier 3: Advisory	Internal efficiency, low risk	Summaries, knowledge retrieval	Sandboxed, lightweight QA

3.3 Controls and governance framework for AI in payments operations

AI cannot be managed like traditional technology. It needs oversight, validation, and clear accountability. In Table 2, we provide a simple classification framework for assessing the risk of deploying AI in payments systems and how banks might mitigate that risk. Below, we provide a proposed RACI framework (Table 3):

- **Expert-in-the-loop design**: subject matter experts must review high-stakes use-cases in a process where responsibilities are split between AI, which processes scale, and humans, who retain accountability. Exceptions should be logged and reused for retraining.
- **Validation and testing lifecycles**: models should be tested on historical cases before deployment, drift and false positive/negative rates must be tracked, and alerts must be set for out-of-pattern behavior post-deployment. Everything must be documented.
- **Data governance and input controls**: data must be validated before use, and access must provided on a role-based basis, with logs maintained of all access and training histories. Where possible, synthetic or anonymized datasets should be used.
- **Explainability and auditability**: where explainability is non-negotiable, interpretable models or overlays with post-hoc explanation tools should be used, with inference logs and rationales maintained.
- **Training and culture**: teams must be trained to challenge models, build muscle memory [2] around prompt testing, override logic, and escalation protocols, making AI augmentation, not automation, the norm.
- **Regulatory engagement**: AI usage should be tracked and documented, with models mapped to applicable regulations and a regulatory liaison designated for ongoing engagement.

This RACI framework for AI controls in payments operations will aid those who wish to effectively apply these to their operations.

4. The visibility gap: intelligence, resiliency, and the role of AI

Based on our experience, most providers tend to react to events, rather than be proactive. When a payment failure occurs, they find out about it in the same way that their clients do: the reconciliation does not balance, the service level agreement (SLA) breach email hits, or the regulator comes knocking. But by then, they are in damage control mode, not prevention.

The frustrating part of this is that it does not have to be that way, since the data required to prevent such failures already exists within the boundaries of these organizations. The problem, of course, is that

2. According to Cleveland Clinic, muscle memory is "the ability to recall and execute movements that have been learned through repetition." https://tinyurl.com/2tm8zzjy

Table 3: RACI matrix: AI controls in payment operations

Control Area	AI team	Ops	Risk	Tech	Audit	Model Risk	Legal/ Reg
Model tiering	R	C	A	C	I	C	I
Human-in-loop	R	A	C	C	I	C	I
Pre-deployment Testing	R	C	C	A	I	A	I
Live monitoring	R	A	C	R	I	C	I
False +ve/false -ve analysis	R	A	C	C	I	A	I
Input controls	A	C	C	R	I	C	I
Explainability logs	R	A	C	R	C	A	I
SME training	A	R	C	C	I	C	I
Docs and logs	R	C	A	C	I	A	C
Reg mapping	C	I	R	I	I	C	A
Audit alignment	C	I	A	C	R	C	C

Legend: R: responsible, A: accountable, C: consulted, I = informed

few have a holistic view of this data, since they tend to be scattered across legacy platforms, buried in regional systems, and/or fragmented across channels. The Operations teams have all the pieces but cannot see the whole picture until it is too late.

Applied correctly, AI can indeed help Operations teams solve such data challenges. And that is because when you pair AI with modern data flows, you are not just collecting information anymore, you are watching your payments systems come to life. You can see queue depths spike before they crash, you can catch exception patterns before they cascade, and you can spot routing delays that signal bigger problems coming down the line.

Imagine what would happen if Operations teams had access to real-time operational intelligence. It would mean they had access to live dashboards that identified and highlighted the health signals that mattered, be able to see queue depth, exception spikes, routing delays, and liquidity signals that told them when trouble was brewing, and receive predictive incident alerts that could catch the subtle patterns they knew about but could not monitor around the clock. It would also mean that they could see rising repair rates, channeling performance deviations and unusual straight-through processing drops that precede bigger failures.

And end-to-end transaction telemetry tracks payment velocity, interbank handoffs and forecast mismatches on inbound flows, before they become tomorrow's headaches.

The critical element that most banks are still not acting on is that their intelligence layer is only as good as the data foundation beneath it. This is where modernization efforts like ISO 20022 and unique end-to-end transaction references (UETRs) - a string of 36 unique characters attached to payment messages sent on the Swift network to help with transparency and tracking - become game-changers. ISO 20022 provides richer, more structured, data moving through systems, improving both interpretability and traceability. UETRs enable full end-to-end transaction tracking across correspondent chains, letting AI build a complete picture of every transaction's journey.

With the Digital Operational Resilience Act (DORA) pushing European banks toward stronger operational resilience, this shift from reactive to predictive operation has become a regulatory necessity. When regulators expect you to demonstrate operational resilience and business continuity, showing up with after-the-fact reconciliation reports is insufficient. DORA changes almost everything about how we think about payments resilience. AI integrated with real-time infrastructure and enriched message formats delivers earlier detection, faster triage, and controlled recovery from operational disruptions.

The culture shift demanded is for payments providers to move from being reactive (cleaning up messes) to being proactive (preventing them).

The question that they, therefore, need to ask themselves is not any longer whether their payments infrastructures can handle always-on expectations, but whether they can monitor issues in real-time rather than having to continue to explain to clients why their monies have been lost in the system. In a world where payment delays make headlines and regulatory scrutiny is intensifying, we would argue that operational foresight is no longer optional.

5. Barriers to adoption

While we firmly believe that applying AI as the foundation upon which new payments operating models are based will have a transformational impact on how payments operations can, and should be structured, we are in no way underestimating the challenge. We are fully cognizant of the fact that AI momentum in payments tends to hit a wall when it meets organizational reality. The biggest barriers are seldom technical: they are predominantly human in nature, manifestations of which are visible in program delays, risk-averse governance, and missed opportunities to scale.

Nevertheless, despite challenges including the fact that there are still many organizations that are grappling with the basics of how to apply AI meaningfully, there are a number of leading banks that are today attempting to apply AI within their payments operations. To help them on this journey, we have highlighted below a number of the areas that could impede their progress. It is by no means exhaustive, but should spotlight what we believe to be some of the main issues that those aiming to execute such projects should be cognizant of.

- **Lack of executive familiarity with AI:** while AI makes the top ten list of concerns that keeps senior financial executives awake at night, few of these executives are actually as knowledgeable about its capabilities as they should be. They are certainly on the whole aware of AI's potential, but many still see it primarily as a tool (like a database) or a "futurist" concept (like blockchain), rather than as something that could, and should be embedded into core processes. It is certainly not viewed by enough executives as a capability that can have strategic implications. And until it is, the necessary investments in AI to make it a transformative capability across functions, will not be made.
  We are currently seeing a number of financial services organizations establish Chief AI Officer roles, but these tend to have very broad mandates, which makes instituting the kind of strategic analysis, investment, and granularity of execution that is necessary very difficult. To successfully execute on the agenda of applying AI to payments operations, you need experts who can make the strategic case necessary for senior executive buy-in, and there are few organizations that have these.
- **Governance**: financial services organizations operate in a highly regulated environment, which means they need to be able to explain what went wrong when regulators come knocking. Consequently, they are typically very careful about applying models whose decisions/recommendations they cannot easily explain to regulators. Given that AI does not behave like traditional software, and generates outputs that are probabilistic, not deterministic, it often makes banks very cautious about how they apply it. In the case of payments, fraud, or sanctions, the banks need to be absolutely certain that the algorithms make not only the correct decisions but also ones that can be justified in front of the regulators.
- **Team fragmentation**: talent gaps within and across silos, combined with fragmentation of teams, exacerbate the challenge of instituting AI within financial services organizations. AI ownership is often split across data science teams, business lines, IT, and Operations, with no single group clearly responsible for knowledge delivery. This fragmentation slows progress and increases the risk of misaligned or duplicated effort. Talent gaps persist not just in engineering, but in Product, Operations, and Risk functions, where the understanding of how to integrate AI into workflows is often still limited. Many banks experiment in silos then struggle with coherent adoption models. They are challenged to scale beyond proofs-of-concept and treat AI as a capability to be tested, not as an infrastructure layer to be deployed, governed, and iterated on, limiting its strategic value.

- **Data governance and integration:** a major challenge for most organizations, financial or otherwise, trying to apply AI to their operations is access to quality data. Without good data that is clean, structured, and accessible, AI will not deliver value. The old adage of "garbage in, garbage out" certainly applies to AI systems. Legacy systems often lock this data away, or present it in formats that are difficult for AI models to interpret, or in a chronically incomplete state with large gaps in the data. It is typical for AI projects to spend 50% of their time on data scrubbing and correction. Integration work further consumes time, money, and organizational patience.
- **Operational issues:** much of the infrastructure in place today, especially within mid-sized and/or traditional institutions, is not built to support real-time orchestration or event-driven triggers. This makes it difficult to deploy AI where it is needed most - in the transaction flow itself rather than around the edges.

In addition to the company-specific challenges, the technology itself also has some limitations that payments providers need to keep in mind. One such limitation is the fact that Large Language Models (LLMs) are not suitable, due to hallucinations, for deployment in precision-heavy (non-stochastic) environments, which might lead to payments data being predicted into existence. But foundation models are making progress, and with appropriate guardrails we expect to see improvements in reliability and predictability in the near term.

Of course, AI is more than GenAI, and financial services organizations should avoid equating all AI with LLMs. There are use cases where traditional machine learning, decision trees, or simple classifiers, outperform the latest foundation models. For example, most fraud engines have deployed AI models for years, but they are classifier rather than generative models. Choosing the right model for the job, rather than chasing the most advanced model, is the best route.

So, in summary, one of the biggest barriers to AI in payments is not the technology itself but the operating model around it. Moving past that will require not just better tools, but better structures, governance, corporate culture, and leadership alignment.

6. Our strategic recommendations

AI project failures rarely stem from bad technology; more likely they occur when technology enthusiasm collides with operational reality. For example, AI in payments is moving into the flow of funds, but implementations crash when they meet the on-the-ground complexity of this area.

We have found that the following seven approaches can deliver results, but each requires guard-rails, practicality, and adaptability.

6.1 Create living plans, not perfect documentation

Le parfait est l'ennemi du bien (Voltaire)

Many financial services organizations get bogged down trying to create perfect AI architecture documents, spending months debating where the models should live, agreeing what data they should consume, and deciding who will pay the running costs. Meanwhile, competitors are shipping their v0.9 and learning from real implementations.

Payments providers should start with good enough. They should document where each AI model sits in payments repair, sanctions, and treasury, present their data flows, and determine ownership. They then need to treat this as a living plan; review quarterly and update as they learn. Waiting for complete clarity will kill innovation faster than bad AI architecture ever could.

6.2 Avoid the hype

A common mistake that organizations make is trying to force every use case into whatever AI flavor is trending on social media. Needs should be classified honestly and the right technology applied to them. They should not apply the latest technologies simply because they are new. For example, LLMs should be used for free-text search, summarization, or dialogue, whereas deterministic logic should be applied for field checks or routing. Organizations should not over complicate the process, and should use simple rules when these work better.

Hybrid patterns should also be considered - allow LLMs to interpret intent, rule engines to handle processing and approval, and the LLMs to summarize the results. Forcing everything into a single bucket will result in over-engineering and/or under-performance. The goal is solving problems, not showcasing technology.

6.3 Design for model decay

Frontier models will continue to be released at a furious rate; however, that does not mean that payments providers will need to deploy every single model immediately. They should by all means validate each model if it appears to offer business value, but being a fast follower might be better for the organization than being at the frontier of applying new technologies, unless, of course, the business model calls for it.

Internal models will also decay, be they rules-based, machine learning (ML)-based, deep learning (DL)-based, or LLM-based. The way that payments providers align internal data sources, such as through a retrieval-augmented generation (RAG) should also be maintained and upgraded regularly. Managing model decay will require constant attention.

6.4 Build governance that enables

Risk, compliance, operations, technology, and business should have joint ownership of model approval, drift monitoring, and kill-switch authority. Organizations will need to maintain a single automated inventory of every live model, but adopt time-bound reviews within fourteen days.

When governance becomes an obstacle, shadow models can emerge. Organizations should empower their Chairs to grant interim approvals with post-hoc validations. Speed matters almost as much as safety in competitive markets.

6.5 Invest in visibility

Building comprehensive telemetry from the start, with event streaming, lineage tracking, and real-time dashboards, is key. Models learn faster and break less when engineers can trace every step. However, payments providers should not insist on perfect observability everywhere before modeling anywhere.

Fast-track domains are needed where data is already healthy, while heavy telemetry spending is reserved for the genuine blind spots. Perfectionist approaches to monitoring slow momentum while adding limited value.

6.6 Measure what executives understand

Every deployment should be anchored to three indicators that executives typically recognize: (i) fewer manual interventions, (ii) higher straight-through processing, and (iii) lower avoidable errors. Release gates and bonuses should be connected to these metrics.

Domain-specific KPIs should be layered-in where they matter, such as in liquidity accuracy for Treasury, take-rate improvement for Merchant Services, etc. This will ensure that incentives are aligned with business unit P&L goals while maintaining enterprise-wide coherence.

6.7 Modernize through intelligent wrapping

Legacy functions should be exposed as representational state transfer (REST)[3] endpoints and should be wrapped back with task-specific agents the payments providers can switch on or off. Feature flags make rollbacks painless when something goes wrong.

Recognizing that some twenty-year-old cores will not wrap economically, a two-track approach should be used, with quicker wins obtained through API wrapping and deeper microservice carve-outs undertaken when wrapping costs approach rewrite costs. Perfect integration must not prevent good automation.

6.8 The reality check

These seven approaches can work in an environment that separates pilot cultures from AI-operated financial services organizations, but rigid adherence to this can be as risky as having no approach at all. Banks should build explicit agility into their approach: living plans that evolve, hybrid tooling that matches problems, time-boxed governance that enables progress, rich telemetry that focuses spending, domain KPIs that align incentives, and dual integration tracks that balance speed with architecture.

Organizations that get this balance right will scale AI safely and at market speed. The ones that do not will keep running expensive pilots that rarely, if ever, become operational reality.

3. REST is a software architectural style that was developed to enable interoperability between different internet systems.

7. Summary and Conclusion

The banking and payments industry is splitting into three camps: those building AI-operated infrastructure, those treating AI as just another tool (much like a new database), and those viewing AI as a distraction unlikely to have any impact. These different approaches will determine who survives the next competitive wave, and they distill into several realities.

AI is moving to the center of payments operations

Generative and traditional AI are no longer add-ons that automate isolated tasks. They're becoming the decision-making fabric of routing, risk, liquidity, and client experience. Stronger authentication at the front end, real-time fraud interdiction in the middle, and self-tuning liquidity management at the back end all draw on continuous-learning systems. Banks that fail to embed this layer will face the same margin and speed squeeze that mobile-first FinTechs triggered a decade ago.

Legacy architecture remains the binding constraint

Most large institutions still process high-volume flows on monolithic stacks designed for batch processing, not real-time events. Exception queues, low straight-through processing rates, and opaque status messages remain stubbornly high despite years of "digital transformation". Wrapping cores with middleware bought time but did not eliminate technical debt, AI-centric operations require deeper re-factoring, payment operations demand observability of every event, risk and compliance systems need to consume those events in real time, treasury and liquidity engines must predict funding needs seconds ahead, and data platforms need to broadcast ISO 20022-rich messages tagged with UETRs. Without this rewiring, AI will only operate at the edges.

Governance, not algorithms, creates the bottleneck

Probabilistic outputs, model drift, and opaque reasoning paths unsettle regulators and boards. Supervisory frameworks from the ECB, PRA, and DORA already require auditable controls around every production model. Institutions that scale safely implement cross-functional AI councils spanning Risk, Compliance, Operations, and Technology. They maintain single inventories that auto-record every model release through CI/CD pipelines. They use time-boxed approval cycles so governance doesn't become an organizational parking brake. And they embed human-override kill switches into workflow tools, not bury them in source code.

Execution follows seven practical rules

1. Publish living, AI-first blueprints for each domain and refresh them quarterly.
2. Match tool to task using lightweight rules or classic ML or other approaches where explainability matters, reserving LLMs for unstructured-text problems.
3. Design for model decay by assuming drift and baking re-training into sprint plans.
4. Implement time-bound governance so risk review keeps pace with agile delivery.
5. Invest in observability first; predictive power follows data clarity.
6. Measure what boards understand: intervention minutes, STP uplift, preventable losses.
7. Modernize through intelligent wrapping plus selective rewrites. Expose legacy functions as APIs and let modular agents orchestrate across them, carving out microservices only when wrapping costs exceed rewrite costs.

What comes next?

AI-operated payments infrastructure isn't theoretical. Every component already exists in production somewhere. Event streaming, ISO 20022 data, agent-based orchestration, and model telemetry. What differentiates leaders is treating AI as infrastructure, not experimentation. That means budgeting for plumbing with the same urgency as revenue features. Data quality, observability, controls these mean empowering a single steering forum to make trade-offs in near real time.

Banks that make this shift will slash cost-to-serve, raise reliability and resilience, and unlock revenue opportunities that deterministic workflows can't address. Those that keep layering brittle AI enhancements onto batch-era cores will watch their relevance erode.

The window for decisive action is narrowing. Institutionalize AI as your payments operating model, or watch competitors build insurmountable advantages while you're still running pilots or debating if AI is even real.

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