

Fabric of Fintech 4.0

A tectonic shift in financial innovation



VARANIUM

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Foreword



Mr. Aparajit Bhandarkar

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In the year following our third fintech report, we have witnessed a remarkable evolution in the technological landscape—one that fintechs have embraced with both hands. While the previous year underscored the resilience of fintech amid economic headwinds, 2025 has emerged as a watershed moment where multiple technological paradigms have converged to reshape not just finance, but entire industries.

The rise of generative AI and large language models has fundamentally transformed how businesses operate and innovate. What began as experimental technology has matured into practical tools revolutionizing everything from customer service to risk assessment. Indian startups, in particular, have demonstrated exceptional creativity in applying these technologies to solve uniquely local challenges while maintaining global relevance.

Simultaneously, serverless computing and various “as-a-service” models have democratized technology access, lowering barriers for fintech innovation. Meanwhile, India’s digital public infrastructure—spanning UPI, ULI, ONDC, and CBDC (₹)—continues to inspire new models of trust, scale, and collaboration. Alongside this, India’s robust physical public infrastructure is complementing the digital stack, creating a seamless foundation for fintech expansion. Together, these elements are making India’s fintech ecosystem ready for its next phase of growth.

Cybersecurity and data privacy remain paramount concerns, but the conversation has evolved beyond mere compliance. Increasingly, businesses are leveraging privacy-preserving technologies as strategic differentiators. Cyber risk quantification is gaining prominence as companies seek to measure and mitigate evolving threats, while advanced cryptographic techniques—such as zero-knowledge proofs and homomorphic encryption—are moving from research papers to real-world applications.

In this fourth edition of Fabric of Fintech, we explore these converging trends in depth, providing a multi-faceted analysis of the evolving fintech ecosystem. Our report not only presents key data and insights but also incorporates perspectives from leading fintech participants across payments, lending, compliance, wealth, insurance, and more. By engaging with industry pioneers, we aim to deliver a more comprehensive and nuanced understanding of the opportunities and challenges shaping the sector.

As we navigate this transformative landscape, one thing remains clear: technology is no longer just an enabler of business—it is the business. Understanding these shifts is crucial not only for technologists but for every decision-maker in today’s digital economy. We hope this report serves as a valuable guide, bridging technological capability with business value and providing a roadmap for the future of fintech.



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About Varanium

Fintech Digital Transformation in India

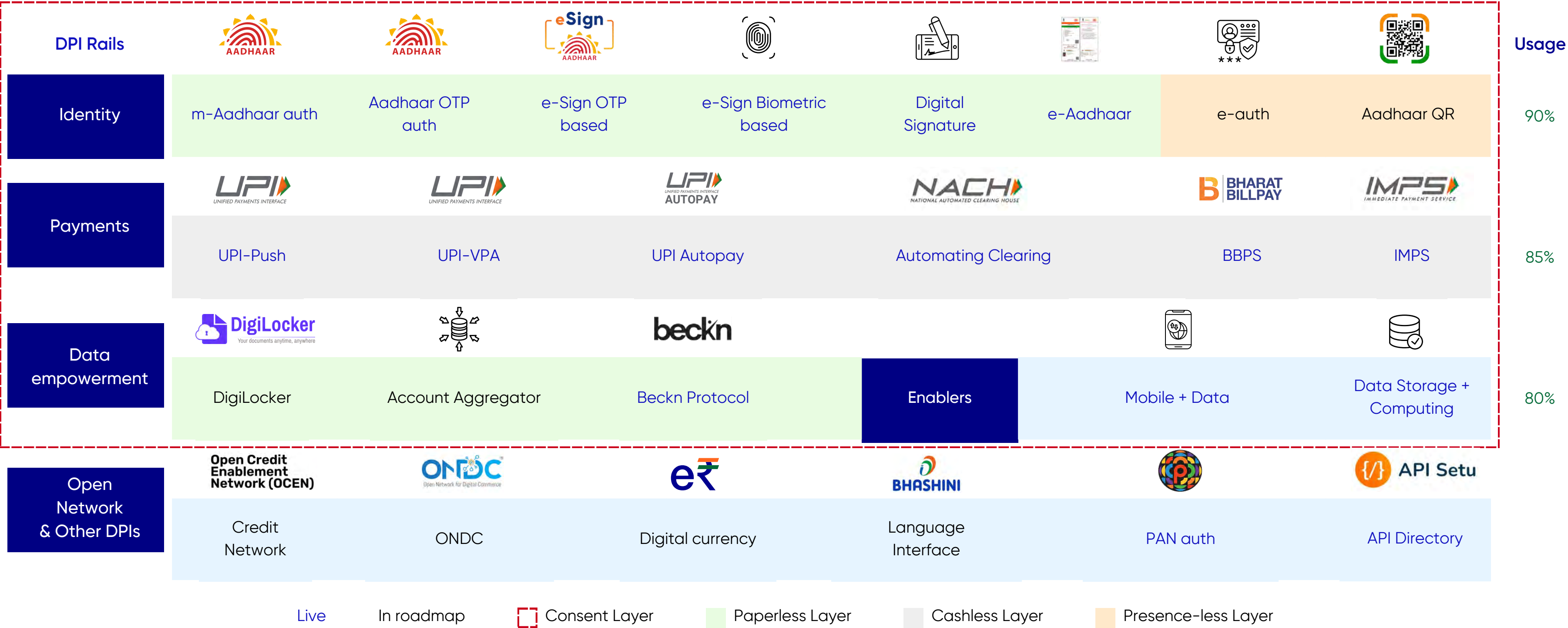


Sources: cable co UK, RBI, ABDN , Yubi

Start-ups Leveraging India Stack: Navadhan

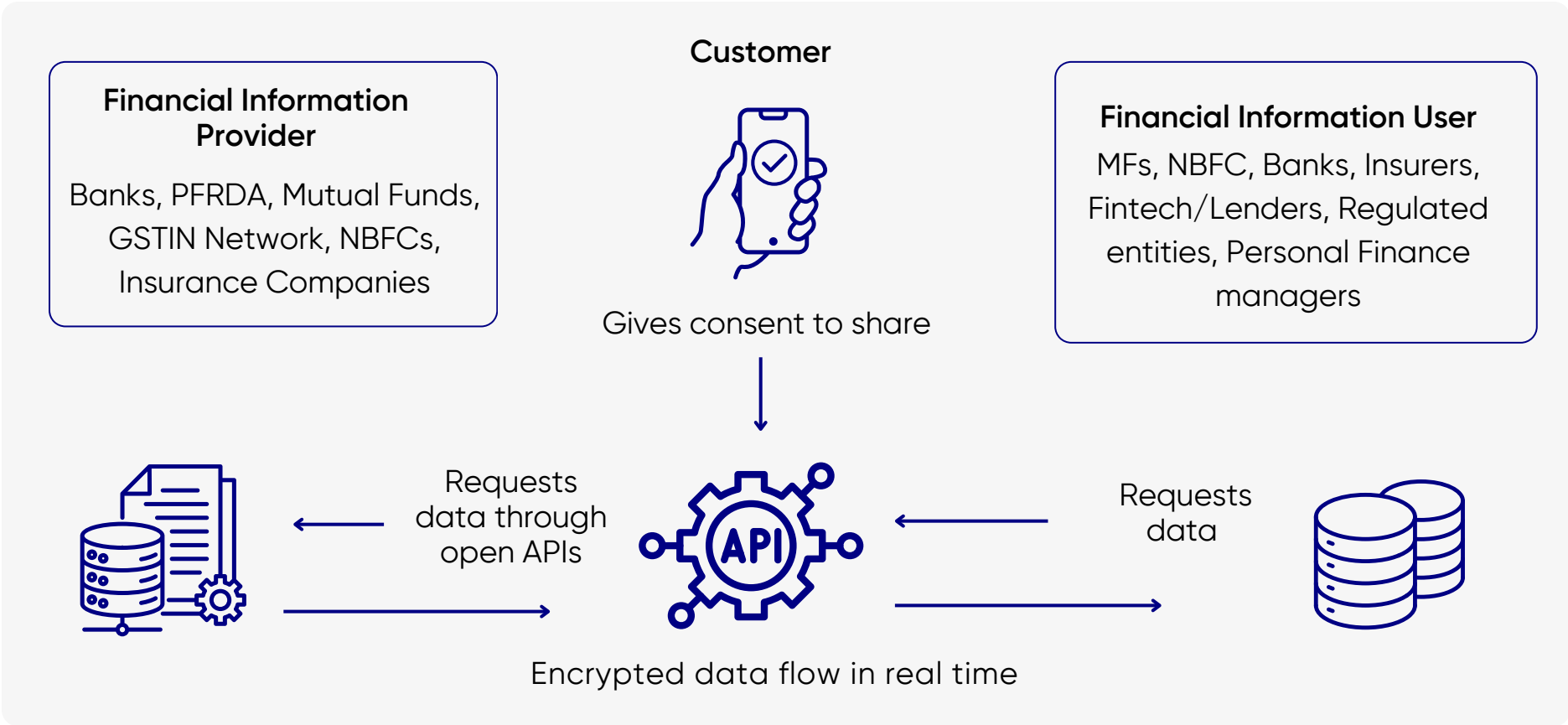


An overview of how Navadhan is utilizing India Stack to drive financial inclusion and disburse loans digitally to small and mid-sized businesses in rural and semi-urban areas.



Account Aggregators

Powering the Future of Data-Sharing in Financial Services



Notable Companies



Foundational Component for Key Government Initiatives



124 mn+

Consents Processed till date

212 crs out of 350 crs

Financial Accounts Activated

168+

FIP

522+

FIP

INR 88,700 crs

Loans Disbursed through AA

Deposits	GST	Insurance Policies	National Pension System	Investments	Unit Linked Insurance Plan	Income tax Returns	Current bank account of corporates	PPF
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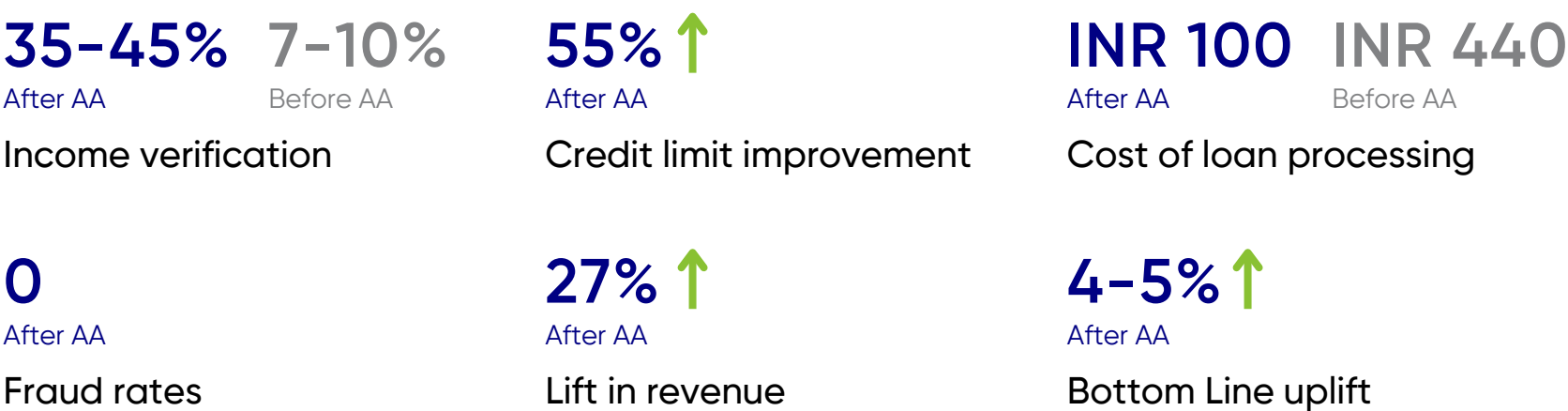
■ Data Provided ■ Data in pipeline to come

Cross-Sectional Use Cases

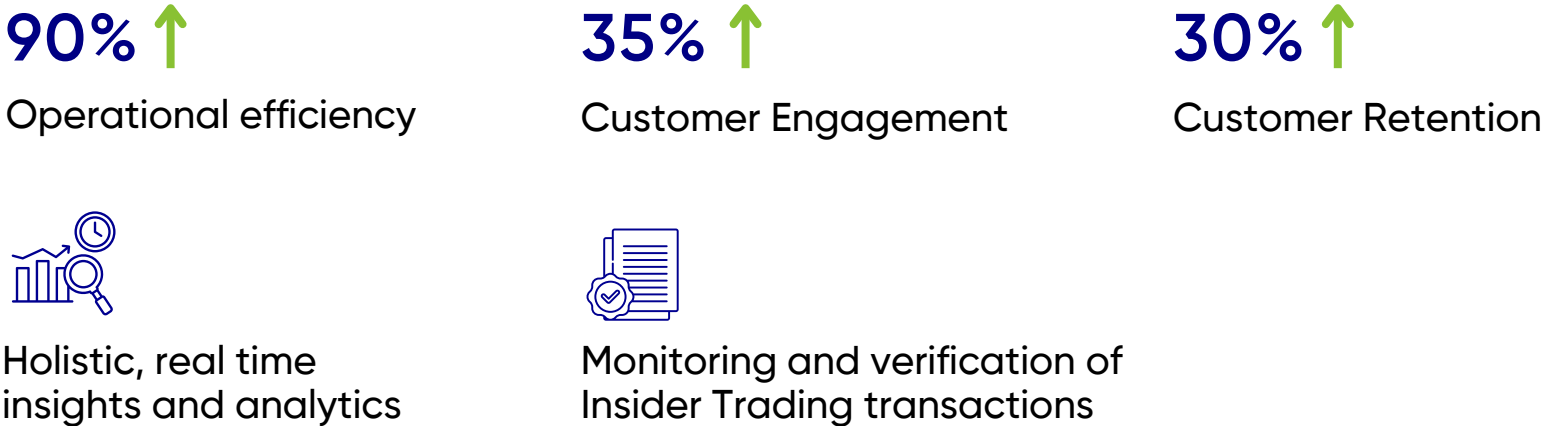


Account aggregator adoption has already led to significant improvement in operational efficiency and fraud reduction in lending

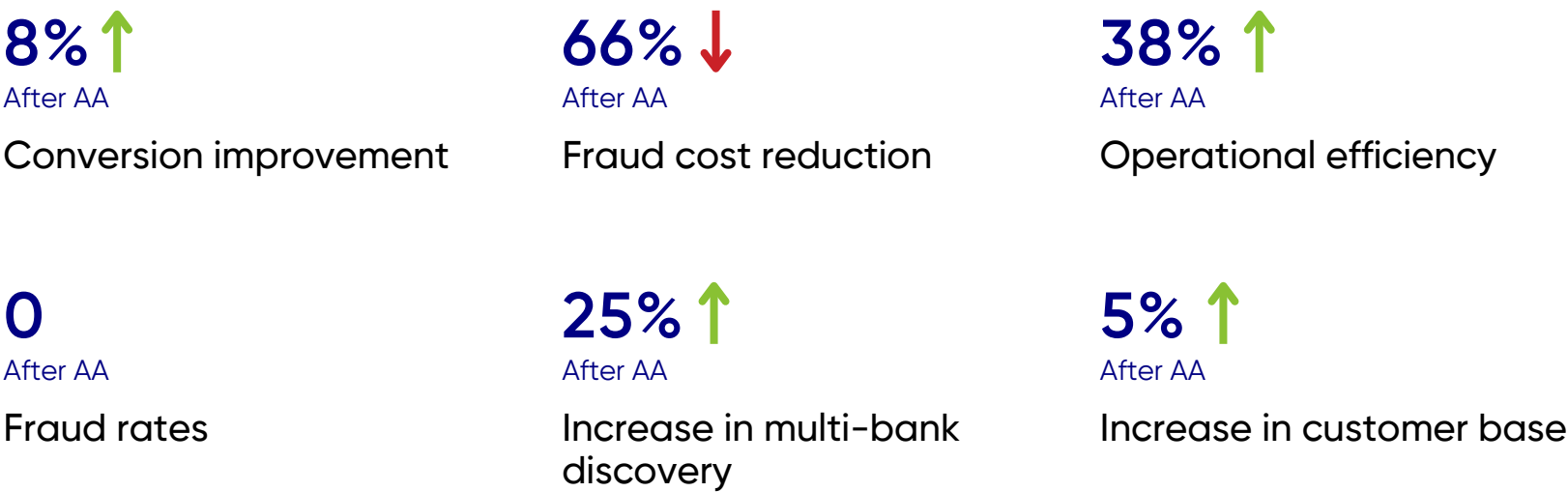
 **snapmint** (Use case: Personal Loan)



Personal Finance Management Entity



LENDINGKART (Use case: Business Loan)



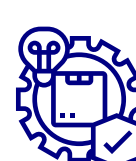
Use cases across financial services

- Lending Use cases**
- To underwrite personal loan, home loan, auto loan, MSME loan, education loan, loan against insurance
 - To monitor loan accounts post disbursal
 - To recover money from defaulters
 - Check account balance before triggering NACH
- Investment Use cases**
- Demat Account Opening and ongoing verification
 - Bank Account Verification
 - Personal Financial Management
- Insurance Use cases**
- Pension Account Opening
 - Income estimation for Life Insurance Policy issuance

MSMEs: Driving India's Economic Growth and Paving the Way to a \$10 Trillion Economy by 2032



27%
to India's GDP



38%
to its manufacturing output



45%
to exports



11Cr
Employment Generated

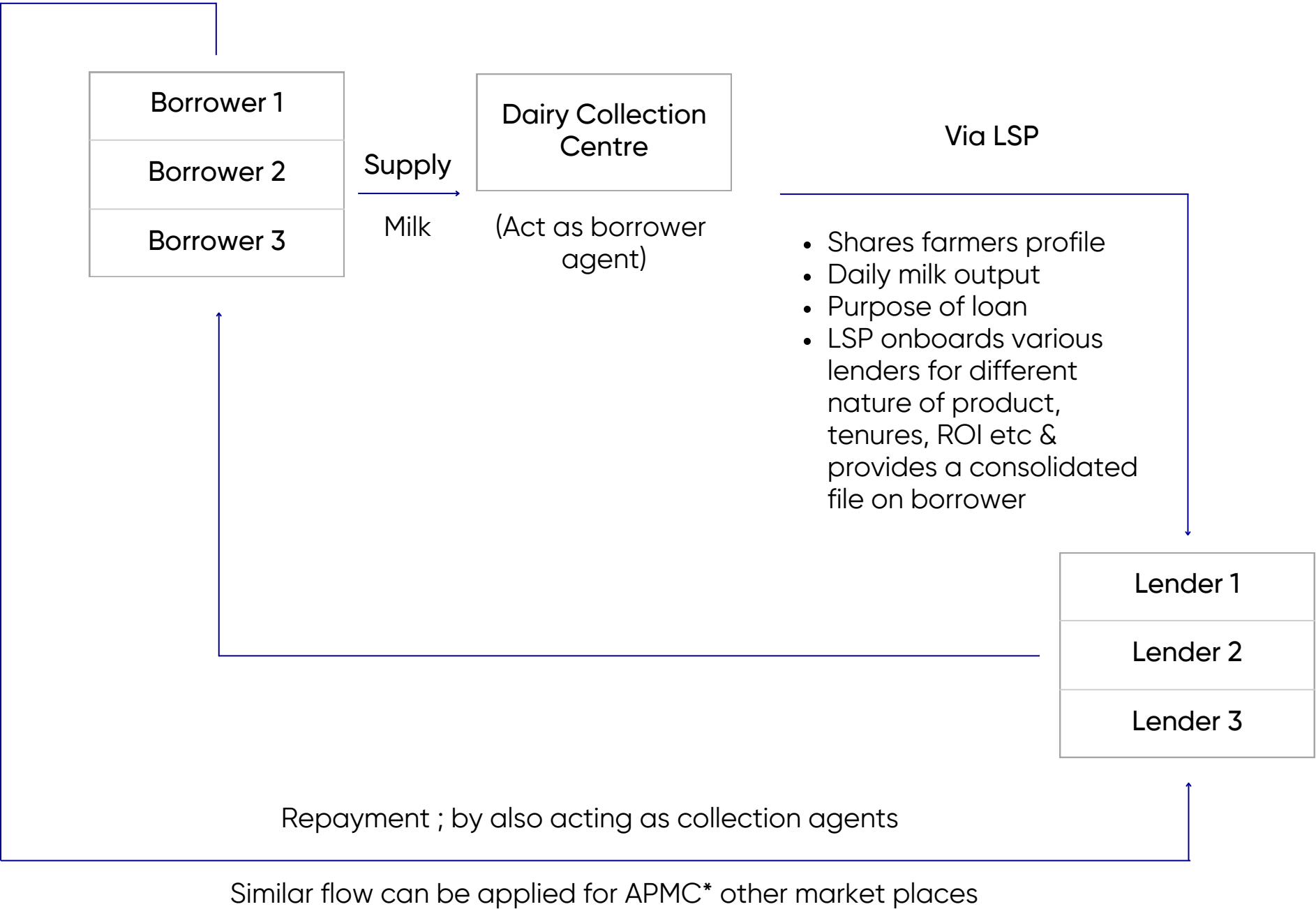
Problem Statement

64 million
MSMEs in India, but only 14% have access to credit

\$530 Billion
current credit MSME gap

How OCEN helps

Building framework to simplify access to credit from multiple lenders



*Agricultural Produce Market Committee

Interview with OCEN



OCEN

Sagar Parikh

Lead - OCEN iSpirt

How does OCEN provide value to platforms like Amazon and Flipkart, which already operate embedded finance programs for their sellers through various lenders?

Amazon and Flipkart and all other platforms want to help the users of their platform to get access to finance thereby enhancing platform loyalty and business on their platforms. In essence they are true borrowers agents where given a chance they want to negotiate the best deal for their users, by following the BA model and principles of OCEN they can be a catalyst in getting these small businesses access to finance. They want to work towards owning the journey on their platform moving away from the Lead sharing model to end to end fulfilment. They have deep understanding of the marketplace model, implementing loan auctioning get the best deal for the borrower and improving approval rates for loan application.

Additionally, with existing platforms like TReDS for bill discounting that regulate end-use cases, how does OCEN differentiate itself from these solutions?

TReDs works generally for larger MSMEs, the model of TReDs is that MSME uploads their invoice to the TReDS portal, the business against which the bill is raised has to accept the bill for lending to take place, then the business makes the payment to the Lender directly thereby establishing collections control. Most of the smaller buyers invoices do not get approved, besides all businesses are not available on TReDS for the mechanism to have full coverage. In essence there are many TReDs required to have more coverage as highlighted in the 2019 "Report of the Expert Committee on Micro, Small and Medium Enterprises" lead by the RBI. Invoice discounting is one such product, there needs to be product innovation on many other fronts..

Loan agents are onboarding each lender individually since there's no existing infrastructure that connects a lender with all others once they're onboarded on the OCEN platform. This makes integration with each lender a time-consuming process. How is OCEN planning to address this challenge and make the process more streamlined and efficient?

We have built two registries, Participant Registry and Product Registry. The OCEN spec ensures the contract between the parties is uniform, reducing the time to implementation, the Product Registry and the Specs allow for any variation of the Loan Product to be created and served.

Interview with OCEN



If a borrower receives offers from multiple lenders, will each lender pull a credit bureau report, or will only the loan agent be permitted to do so? Allowing all lenders to access the report could potentially impact the borrower's credit score.

The Lender will report the loan to the Bureau as a loan enquiry as a soft pull at the discovery stage under a different product code, this will ensure the credit score is not impacted for the borrower, the lender only before disbursement does the hard pull from the bureau.

What regulatory challenges have you encountered while developing and deploying OCEN? How do you work with regulators to ensure that OCEN aligns with the evolving financial regulations?

The regulatory framework for SME lending needs to be separated from Retail Lending. Derived KYC, Recognition for the Borrowers Agent role and support for e-liens is what we aspire to be solved for.

How will OCEN and ONDC coexist? Given that a borrower agent under OCEN functions more like a broker than an agent, what benefits and challenges do you anticipate?

The MSME credit gap is huge, many platforms will be required for coverage and many mechanisms are required to ensure MSMEs get credit just like TReDS alone cannot solve for the entire credit gap. The underlying principles of CashFlow based lending will help to reduce the Credit Gap.

OCEN has been conducting experiments for the past two years. When can we expect to see a full-fledged rollout?

We have got valuable insights from the Pilots done based on the learnings we announced OCEN 4.0 based on which both Private and Public Networks are being built as we speak. The platform is production ready and being used, we invite more Borrower Agents and Lenders to come onboard and be a part of the journey.

Existing: Platform-Centric Model



In the current platform-centric digital commerce model, buyers and sellers must use the same platform/application to do a business transaction

Future: Open Network Model



In ONDC's network-centric model, buyers and sellers can transact no matter what platform/application they use through an open network

Overview

ONDC is a freely accessible government-backed platform that aims to democratize e-commerce by moving it from a platform-centric model to an open network for buying and selling of goods and services. It aims to enable consumers to buy products from all participating e-commerce platforms through a single platform. It is an initiative of the Department for Promotion of Industry and Internal Trade (DPIT) under the Ministry of Commerce and Industry.

What will it bring

- Increase e-commerce penetration in India.
- Democratize the country's digital commerce (e-commerce) and provide alternatives to private e-commerce sites.
- Reduces reliance on large monopolistic platforms

Potential Impact

- It will promote product discovery, increase the number of alternatives and broaden customer reach.
- Since the experience layer (UI/UX) is independent of the network, there will be new startups that will aim to provide better features like price comparison, product unboxing, user review analytics, etc.
- Establish seamless integration across the supply chain.
- It will be difficult to reconfigure for leading e-commerce businesses, requiring a total overhaul of their systems and the loss of advantages such as control over the user experience and consumer behavior information.

Buyer App

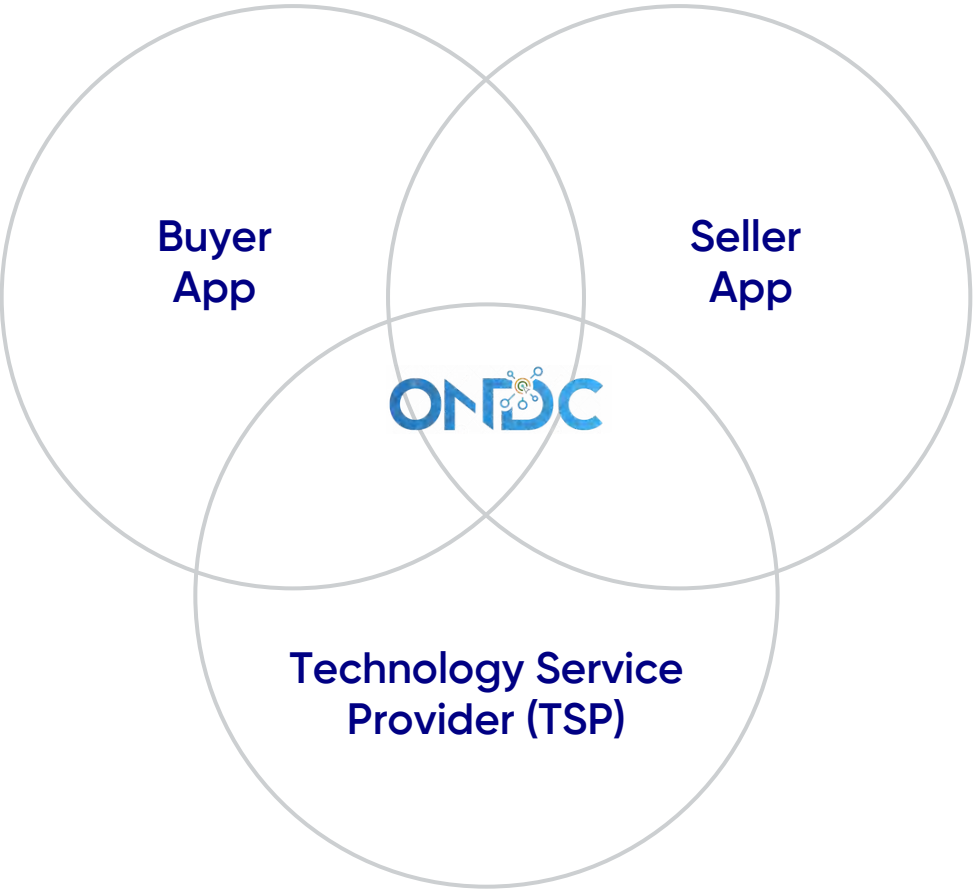
- Front facing buyer application that has or plans to build a user base
- The sellers product will be embedded in the buyer app
- The buyer app earns a fee on the sale of a product
- All prevailing regulatory norms will need to be adhered

Seller App

- The institution lists its product on the network to make it available for buying apps to sell
- All prevailing regulatory norms will need to be adhered to
- The seller app on ONDC has to be a regulated entity for their respective category
- The seller app will pay ONDC a network fee: Credit: TBD* | Insurance: TBD* | Investments: TBD*

Technology Service Provider (TSP)

- A TSP can create a white labelled solution that complies with ONDCs' buyer app and/or seller app requirements
- The white labelled application can be used by prospective buyers or sellers that want to join the ONDC network

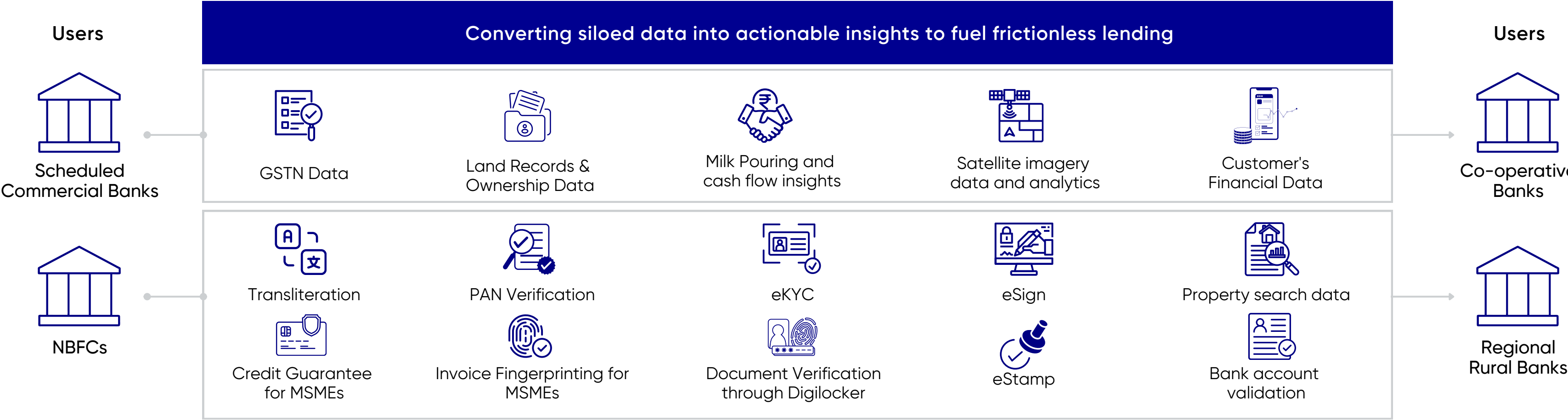


Overview	What will it bring	Challenges
ONDC has democratized India's digital e-commerce landscape and is now extending its architecture to revolutionize financial services across four key domains: credit, insurance, investments, and gift cards. The aim is to create an open and standardized APIs and processes to simplify integration between product manufacturers and distributors	<ul style="list-style-type: none"> • Reduction in cost of integration especially for the small players • Allow distributors to create and offer new products to underserved segments • Will make economic sense to acquire smaller ticket size clients • Enable customer retention for companies as they can offer allied/complementary services 	<ul style="list-style-type: none"> • Compliance with regulatory standards; • Integration with the legacy systems and processes; • Entrance will face stiff competition from established financial service providers and platforms that dominate the market with similar offerings, while simultaneously working to build trust among end-users • Cost of acquiring new customers may increase especially for traditional banks and fintechs, as multiple players will compete for same customer • Service quality gaps may arise due to disintermediation

*To be decided
 Source: ONDC, Varanium Research

Unified Lending Interface an RBiH Initiative

A credit digital public infrastructure



Key principles of ULI

Standardisation of protocols API-fication (Plug-and-play) Digitization of non-digitised systems/processes/databases Security Scalability Open for all

Overview	What are they solving for	Doesn't solve for
A technology platform built to facilitate easy access to authenticated data from various sources, through standardized APIs to which all lenders can connect seamlessly through a 'plug and play' model.	<ul style="list-style-type: none">Eliminating the need for lenders to carry out multiple bilateral integrations with each data and service provider.Reduce the burden on borrowers to collate the documents from different sources.Lead to faster loan processing and approvals.Reduction in fraudulent applicationsAccess to both financial and non-financial data such as digital land records, satellite image data etc.	<ul style="list-style-type: none">Doesn't solve for recovery challenges.Accessing formal credit requires collateral which most individual/ MSMEs don't posses.Absence of credit history and financial records of new to credit customers

Interview on Data Privacy



Nikhil Jhanji

Senior Product Manager

How will the Digital Personal Data Protection (DPDP) Act impact the fintech ecosystem, particularly in terms of data compliance, cost, innovation, and customer trust?

The impact of the DPDP Act on the fintech ecosystem shall force enterprises to think beyond the compliance checkbox.

- **Data Compliance & Operational Overhaul -** *Fintechs handle vast amounts of sensitive personal data. The DPDP Act mandates explicit consent, purpose limitation, and data minimization, requiring fintechs to rethink data flows, automate compliance, and ensure audit readiness to avoid penalties.*
- **Accounting for Cost of Compliance-** *Compliance is no longer a checkbox—it's an ongoing commitment. Building privacy-first architectures, integrating consent governance platforms, and conducting regular risk assessments will add costs, but scalable automation can ease the burden.*
- **Innovation vs. Regulation-** *While compliance may seem restrictive, fintechs that embed privacy by design can turn it into a competitive advantage.*
- **Customer Trust as a Differentiator-** *Data breaches and misuse have made users cautious. Fintechs that proactively demonstrate transparency, user control over data, and secure data-sharing mechanisms will gain a strong trust advantage in a crowded market.*

A key shift across sectors shall be the movement away from a single and vague tick-box based consent mechanism (alongside a generic privacy policy) to granular and use-case specific privacy notices that balance digital enablement while being on the right side of the law.

Ultimately, fintechs that move fast on compliance, leverage privacy automation, and align with evolving regulations will not only avoid friction but also unlock new opportunities for growth and innovation

Interview on Data Privacy



How does the DPDP Act's potential data localization requirements impact the interoperability of global businesses operating in India? Has IDfy developed any solution to help these global businesses? Further, how will the DPDP address enforcement challenges for entities that do not have a physical presence in India but process the personal data of Indian citizens?

The DPDP Act explicitly permits the transfer of personal data outside India without requiring mandatory localization. However, Rule 12(4) introduces a potential exception, granting the Central Government the authority to impose territorial restrictions, particularly on Significant Data Fiduciaries (SDFs). While this discretion remains undefined, it leaves room for future regulatory interventions based on evolving policy considerations.

It is prudent to understand how the DPDP Act is different than other global laws for example in terms of collecting consent in 22 languages, additional obligations for DFs etc. while charting enterprise compliance pathways. Privy by IDfy enables business to automate compliance and embed privacy into digital workflows, turning DPDP readiness into a strategic advantage, irrespective of their geographic presence.

Does the DPDP strike the right balance between protecting personal data and fostering innovation, especially in data-driven sectors like AI, fintech, and health tech?

The DPDP Act seeks to balance individual privacy with data-driven innovation through a flexible, principle-based framework that allows businesses to build compliant and innovative data strategies. Unlike other global regulations, it does not mandate blanket data localization, easing cross-border data flows for sectors like AI, fintech, and health tech. While it introduces consent-based processing, it also permits legitimate uses, offering businesses flexibility in handling data when explicit consent is not feasible. However, challenges such as unclear sectoral guidelines, particularly in AI and health tech, and resource-intensive compliance obligations for smaller players may slow early adoption and innovation.

Given India's vast informal economy and digital ecosystem, how feasible is it for organizations to implement DPDP compliance, given that EU GDPR implementation has been costly for businesses, particularly SMEs. Does the DPDP Act impose a similar or higher financial burden on Indian businesses?

If executed effectively, the DPDP Act can balance compliance costs and enhance India's digital trust ecosystem, though success hinges on pragmatic implementation. Small and medium enterprises must master the balance between compliance and innovation by embedding privacy by design and staying agile in a changing regulatory landscape. Prioritizing quick wins like automated consent management and audit readiness ensures faster DPDP alignment. A flexible privacy framework tailored to business workflows enables compliance without hindering innovation. By leveraging privacy automation and process transformation, businesses can stay ahead of evolving regulations and ensure long-term

Interview on Data Privacy



While GDPR applies to both digital and non-digital data, the DPDP Act is limited to digital personal data. What could be the rationale for restricting its scope to only digital data? Does this narrower focus reduce the effectiveness of the DPDP Act or compromise the comprehensive protection of personal data? Additionally, do you anticipate that the scope of the Act might be expanded in the future to include non-digital data as well?

The DPDP Act restricts its scope to digital personal data for reasons of practicality and enforceability. Unlike GDPR, which covers both digital and non-digital data, DPDP focuses on what is measurable, auditable, and enforceable. Digital data leaves an audit trail, making compliance and oversight significantly more feasible than tracking physical records. Given India's rapidly digitizing economy, particularly in sectors like fintech, health tech, and e-commerce, the law aligns with the reality that most regulated data processing is already digital-first.

This narrower scope does not necessarily weaken the Act's effectiveness. Existing sectoral laws already govern sensitive non-digital data, such as healthcare records, while the increasing digitization of businesses is steadily reducing reliance on paper-based records. The Data Protection Board (DPB) could also issue guidance for hybrid scenarios, ensuring that organizations handling both digital and physical data remain aligned with privacy principles.

Future expansion of the Act to include non-digital data is possible but not imminent. As digitization continues to accelerate, regulatory frameworks may evolve, but for now, limiting the scope to digital data ensures smoother implementation without imposing excessive compliance burdens on businesses.

GDPR has stringent requirements for data transfers outside the EU (e.g., adequacy decisions). How does the DPDP Act's approach to cross-border data transfer compare in terms of regulatory complexity and business impact?

The DPDP Act adopts a more flexible stance on cross-border data transfers compared to GDPR's strict adequacy-based model. While GDPR restricts transfers unless the recipient country has an adequacy decision, or businesses implement Standard Contractual Clauses (SCCs) or Binding Corporate Rules (BCRs)—both often costly and complex—the DPDP Act permits transfers by default unless explicitly restricted by the government. This reduces friction for global businesses but leaves ambiguity around potential restrictions and whether additional safeguards like SCCs will be required.

Sectoral regulators like RBI may still impose stricter localization rules, leading to industry-specific challenges. Additionally, if the government introduces special conditions for transfers, compliance costs could rise, particularly under Rule 12(4) of the draft DPDP Rules 2025. Clear guidance will be crucial to ensuring businesses can navigate these evolving requirements effectively.

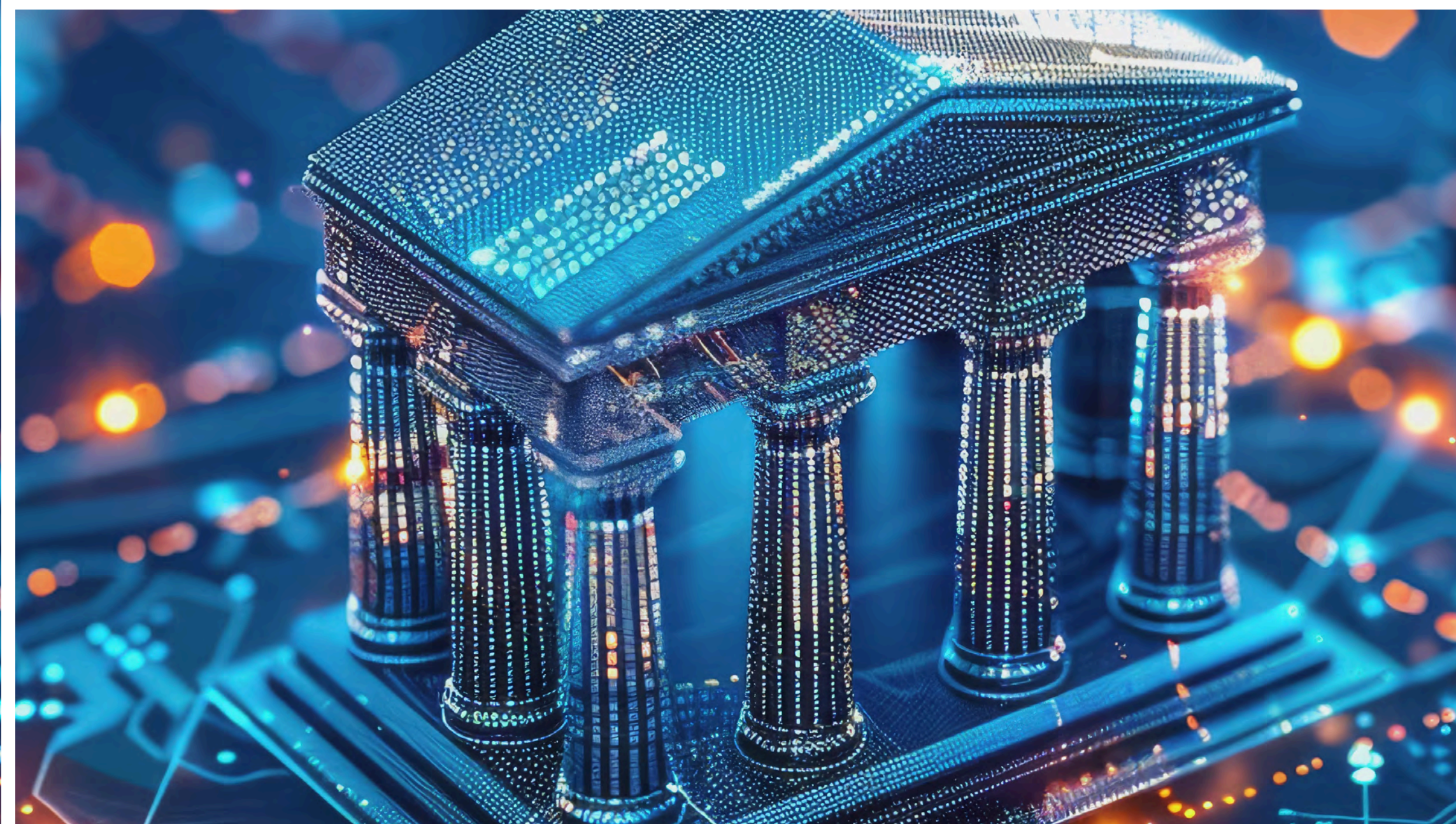
Interview on Data Privacy



How do you see competition shaping up in this space? Do you believe businesses enabling DPDP compliance can thrive as standalone entities, or will this ultimately become just a segment, integrated as one of many solutions offered by enterprises alongside other offerings?

The DPDP compliance space is evolving rapidly, and while there is room for specialized privacy-focused solutions, long-term sustainability as standalone entities will depend on differentiation and scalability. Large enterprises increasingly view compliance as a broader governance function, making it likely that privacy compliance may become one of many integrated solutions within enterprise risk platforms.

That said, the complexity of consent management, data mapping, and continuous compliance monitoring presents opportunities for niche players who can offer deep expertise and automation.. Ultimately, privacy compliance will move from being a one-off regulatory requirement to a core component of digital trust, and companies that align with this shift will have the greatest staying power



Future of Fintech in India

Interview with QuantEco



Vivek Kumar

Economist

India is often touted as the fastest-growing major economy, but are we relying too much on headline GDP growth while ignoring structural weaknesses like jobless growth and income inequality?

India's economy is complex and multifaceted, marked by both opportunities and challenges. The analogy of India as a large elephant in a room—where several blindfolded observers touch and feel different parts of the animal to get a sense of what it is—illustrates this multifaceted nature. The economy often manages to surprise both optimists and pessimists alike.

While GDP growth rate may decelerate from 8.2% in FY 2023-24 to around 6.4% in FY 2024-25, India's prominence in global growth remains significant. From a headline perspective, India remains the fastest-growing major economy within G20 countries and is projected to maintain this position over the next five years (2025-2029) based on IMF projections.

That said, a deeper analysis reveals persistent structural challenges, including income inequality. The post-COVID recovery has been uneven across sectors—agriculture, industry, and services—exacerbating existing disparities and limiting the complete trickle-down benefits of headline growth. At the same time, the uneven pace of recovery has benefitted few sectors, which has sprung new age winners.

Given the recent Budget's personal income tax relief aimed at the middle class, which has seen muted income growth in recent years, do you believe this will be a significant driver of increased consumption in the economy? How do you foresee this change impacting consumer behavior and overall economic growth in the short to medium term?

Income tax revenue has grown robustly, averaging close to 22% annually in nominal terms over the past three years. However, this growth has outpaced the wage and income growth in the formal sector, reflecting the government's reliance on ancillary taxes such as the Securities Transaction Tax (STT) and other cesses. The STT's increased contribution is driven by higher equity market participation and upward revision in tax rates in recent years.

The government estimates that the income tax relief will result in a revenue loss of ₹1 lakh crore. Although modest in scale, potentially impacting only 2-3% of the population, this mini stimulus could result in a multiplier effect, potentially raising the GDP growth by 20-30 basis points in FY 2025-26. Thus, forecasts could see upward revisions from 6.4% to 6.6-6.7%.

A portion of this relief may be directed toward savings or debt repayment, limiting its immediate impact. Nevertheless, it is expected to moderately boost consumption and economic activity.

Interview with QuantEco



With Donald Trump returning to office, how do you see his trade policies impacting global trade dynamics, particularly for emerging markets like India? With protectionist policies rising globally, especially in key markets like the U.S. and China, could India face new protectionist measures that impact exports and foreign investment? Further, how should India strategically position itself in terms of global trade and foreign policy to maximize its economic potential in this evolving landscape?

The global trade landscape remains highly uncertain, and Trump's protectionist stance is well known. While the specific impacts on India are unclear, it is worth noting that India ranks relatively low in terms of the magnitude of merchandise trade deficit it runs with the US.

However, certain isolated concerns could still arise. For example, Trump has previously highlighted high tariffs on specific products such as Harley-Davidson motorcycles. India has taken steps to mitigate some of these concerns by lowering duties on certain low volume items in the FY 2025-26 Union Budget.

Strategically, India is well-positioned to leverage its geostrategic importance through behind-the-scenes negotiations with the U.S., particularly given their shared concerns regarding their respective high trade deficits with China along with China's role in dominating global supply chains in case of several commodities. This cooperative approach could help India navigate potential challenges while fostering stronger trade relations.

Additionally, India has made structural adjustments, such as depreciation of the rupee by nearly 4% in the last four months, which helps cushion the impact of global trade volatility. These strategic maneuvers demonstrate India's proactive stance in mitigating trade-related risks.

With inflationary pressures persisting and global monetary policies remaining uncertain, how do you see the RBI balancing growth and inflation control in the coming months? Additionally, with the rupee facing volatility against the dollar, do you foresee further depreciation risks, and what measures can be taken to ensure currency stability?

The RBI faces a delicate balancing act, with slowing domestic growth on one hand and external risks on the other. The recent 25-basis-point rate cut reflects the central bank's attempt to support growth amid expectations of moderating inflation, particularly in food prices.

Inflation could decline from the current 4.8-4.9% average to around 4.2-4.3% next year, assuming no major climate shocks. Currency depreciation—estimated at 4-5% in recent months—could have a limited impact on consumer inflation, as the government is likely to absorb higher fuel costs instead of passing them on to consumers. However, wholesale prices (WPI) and industrial costs may see more immediate effects, spread over multiple quarters.

To stabilize the currency, the RBI could consider short-term measures such as incentivizing NRI deposits by offering higher interest rates and temporarily reducing the Cash Reserve Ratio (CRR) on such deposits. Maintaining macroeconomic stability through sound fiscal and monetary policies remains crucial for attracting long-term capital inflows.

The government's ability to maintain its fiscal consolidation trajectory, while supporting targeted stimulus measures along with liberalization of FDI in the insurance sector, will also play a supportive role in ensuring currency stability.

Interview with QuantEco



Given the government's focus on increased capital expenditure and welfare spending, how sustainable do you believe India's current fiscal policy is in the long term? What structural reforms are urgently needed to address the challenges of high public debt, fiscal deficits, and slow private investment?

India's fiscal deficit, which peaked at 9.2% of GDP in FY 2020-21 in the backdrop of counter cyclical policy support during the pandemic. Since then, the fiscal deficit has been on a correction path, targeting 4.8% for the current year and 4.4% for the next year. While progress is being made, the high public debt remains a concern.

The government plans to shift its focus from targeting fiscal deficits to targeting debt levels starting in FY 2026-27. Key strategies that could aid this transition, include:

- *Sustaining healthy nominal GDP growth, which will help reduce the debt-to-GDP ratio over time.*
- *Continuing fiscal consolidation while ensuring that public investments support long-term growth.*
- *Optimizing the structure of government securities by issuing longer-term or flexible-rate securities.*

Structural reforms are essential to complement these efforts. Priorities include labor market reforms, enhancing infrastructure, strengthening the financial sector, and improving the ease of doing business to stimulate private investment. The government's recent emphasis on supply-side reforms, such as enhancing agricultural logistics and addressing bottlenecks in key food markets, also aligns with broader fiscal sustainability goals.

Additionally, improving tax compliance and revenue mobilization will support the government's fiscal objectives while providing room for productive public investments.

Fintech: Powering India's Path to a \$10 Trillion Economy



In the next decade, India is projected to become a USD 10 trillion economy. Fintech is expected to play a crucial role in achieving this ambitious goal by significantly impacting various parameters of the GDP equation.

$$GDP = C + I + G + NX$$

Consumption (C)

Digital Payments:

- India's fintech revolution has been a key driver of its digital payments surge, with innovations like UPI, mobile wallets, and digitization solutions for payment in rural areas such as AEPS and MATM transforming financial accessibility.
- As UPI expands internationally, alongside initiatives like Project Nexus, CBDC and Machine to Machine payments, Finternet we expect India's digital payments market is poised for exponential growth, projected to reach USD 279.80 billion by 2029, further fueling the country's economic progress.

Expanding Access to Credit:

- Fintech innovations are set to drive India's economic growth by revolutionizing digital lending. Initiatives like OCEN, which establishes a framework for digitizing MSME lending, and ULI, which builds a credit digital public infrastructure, public tech platform frictionless lending, etc will further transform access to credit. By leveraging
- India's Digital Public Infrastructure (DPI) and other initiatives launched by RBI fintechs can enable seamless, frictionless loan disbursements within hours, empowering businesses and accelerating economic progress.
- We expect that digital lending to reach USD 350 billion by 2030.

Personalized Financial Products:

- With the integration of Generative AI and Account Aggregator frameworks, fintech is set to revolutionize financial services by enabling hyper-personalized financial planning and product recommendations.
- This will empower consumers with deeper insights, helping them manage their finances more effectively and make informed spending decisions, ultimately contributing to India's economic growth.

E-commerce Growth:

- Fintech payment solutions are driving the growth of India's booming e-commerce sector, serving as its digital backbone.
- Companies like Razorpay, Juspay, and Easebuzz are developing integrated software and payment solutions that enable seamless, fast, and secure transactions. India's e-commerce market will grow to USD 163.7 billion by 2029, and fintech innovations will play a pivotal role.

Impact on Consumption

By facilitating easier payments, expanding credit access, and supporting e-commerce, fintech is directly boosting consumption expenditure, a major component of GDP.

Fintech: Powering India's Path to a \$10 Trillion Economy

Investment (I)

India's fintech ecosystem, the third-largest globally, is emerging as a fintech superpower, having attracted significant investments of over \$37 billion in the last seven years. With its rapid innovation in digital payments, lending, and wealth management, India's fintech sector continues to drive financial inclusion and economic growth on a global scale.

Promoting Retail Investment:

- Fintech platforms are revolutionizing investments in India by making stock trading, mutual funds, and other financial products more accessible to retail investors.
- We have already witnessed an onboarding of over 1 crore unique investors on the NSE in just the last five months (initial 1 crore investors on NSE took 14 years), driven by seamless onboarding through DPI rails, personalized solutions and buoyant markets.
- With a young population and rising financial literacy, India is poised to see a significant surge in new investors. This growing retail participation will further boost capital formation, fueling the country's economic growth.

Improving Investment Efficiency:

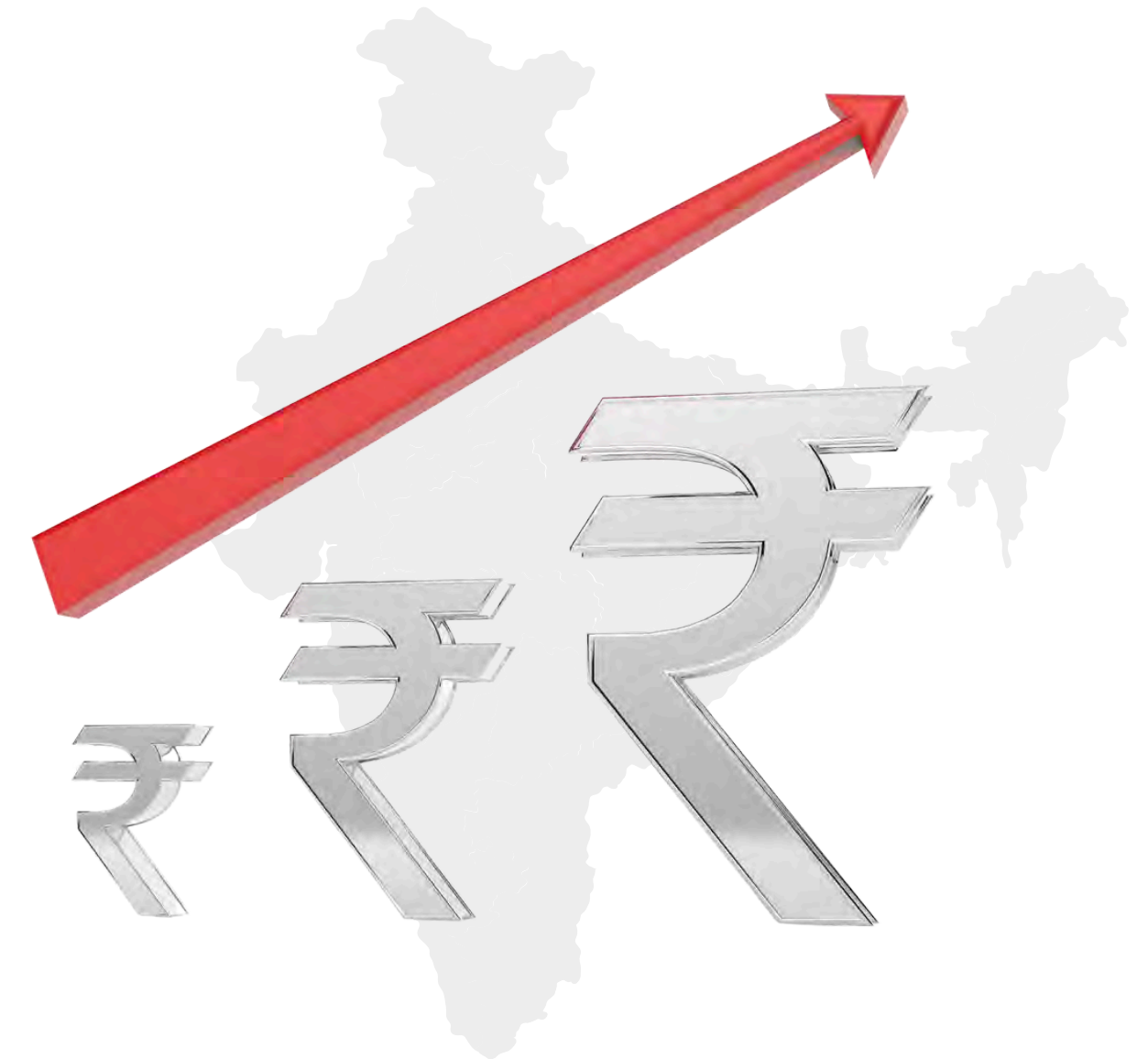
- With the adoption of Account Aggregator, fintech is set to enhance investment efficiency by providing seamless one-view access to financial data of an individual.
- This will enable automated portfolio management, data-driven investment insights, and smarter financial decision-making, ultimately empowering investors and contributing to India's economic growth.

Infrastructure Financing:

- With the easing of regulations around surety bonds, fintechs are poised to drive innovative financing mechanisms for infrastructure projects.
- These will attract greater private investment into crucial sectors, accelerating India's economic growth.

Impact on Investment

Fintech is fostering a more vibrant investment environment by easing access to capital, promoting retail participation, and improving investment efficiency, thus driving the 'I' component of GDP.



Fintech: Powering India's Path to a \$10 Trillion Economy

Government Spending (G)

Improving Tax Collection:

- Fintech solutions can streamline tax collection processes, reduce tax evasion, and broaden the tax base through digital tax filing and payment systems.

Efficient Disbursement of Government Benefits:

- Direct Benefit Transfer (DBT) programs, powered by Fintech infrastructure, ensure efficient and transparent delivery of government subsidies and social welfare payments directly to beneficiaries' accounts, reducing leakages and improving the impact of government spending.
- India's DBT program is one of the world's largest, utilizing digital infrastructure to transfer benefits to millions of citizens efficiently.

Fintech for Government Services:

- Digital platforms for government services (GovTech), often leveraging Fintech solutions, enhance citizen access and reduce administrative costs, improving the value derived from government expenditure

Impact on Government Spending

Fintech enables more efficient and impactful government spending by improving revenue collection and optimizing disbursement, contributing indirectly but significantly to GDP growth.

Net Exports (NX)

Facilitating Cross-border Payments:

- With the emergence and integration of closed-loop cross-border systems, DLT technology, and CBDC, fintech payment solutions are enhancing transparency, enabling seamless transactions, and ensuring faster settlements.
- Beyond reducing the cost of cross-border transactions, fintech innovations in cross-border financing are streamlining trade by offering end-to-end management of goods until payment completion. These advancements are making international trade more efficient, boosting India's exports, and driving economic growth.

Improving Supply Chain Finance:

- Fintech solutions can optimize supply chain financing, making it easier for exporters to manage working capital and trade finance, thereby facilitating smoother trade flows.
- Further, recent modifications in trade credit insurance for reverse factoring will further support MSME financing

Impact on Government Spending

While the direct impact might be less than on other GDP components, fintech can create a conducive environment for international trade and investment, potentially contributing positively to NX in the long run.



Tech Trends in Fintech



Generative AI

- Personalized Financial Recommendations
- Contextual Customer Support
- Fraud Detection and Prevention
- Automated Analytics and Reporting
- Risk Assessment and Credit Scoring

"Generative AI is not just hype, it's a \$15.69 billion market opportunity in financial services by 2034, poised to revolutionize the industry through unprecedented efficiency and personalized customer experiences."

M2M Payments

- IoT based Machine to Machine Payments
- Autonomous / Trigger based payment
- HSM based secure Machine wallets and escrow
- Micro-Earnings & Micropayment support

"Machine-to-Machine payments are exploding, with the Autonomous IoT Payments market estimated at \$54.3 billion in 2024 and projected to surge to \$3.775 trillion by 2037, marking a staggering 42.4% CAGR and signaling a new era of automated commerce."

CBDC and DeFi

- Cross Border CBDC with real time settlement
- Smart contract support & Multicurrency Bridge
- Automated LRS compliance
- Online and Offline Payment support

"CBDCs are going mainstream with 98% of global GDP exploring their potential, while DeFi is surging ahead, projected to grow at a 53.7% CAGR. This convergence signals a transformative shift towards a more inclusive and efficient future of finance."

Cyber Security

- Cyber Risk Quantification
- Proactive Purple Teaming
- GenAI Model and deployment security
- Preventing and Detecting Supply Chain Attacks
- Behavioural Biometrics and enhanced IAM

"Cybersecurity is paramount in Fintech, with global spending projected to reach \$202.8 billion in 2025. Robust cyber defenses are now mission-critical for maintaining trust and stability in the digital financial ecosystem."

Metaverse Banking & DeFi

- Immersive Virtual Branch Experience
- Avatar Based Advisory and Support
- Digital Collectibles Vault & Virtual ATM
- On Ramp - Off Ramp Solutions & Liquidity Pools

"Metaverse Banking and DeFi are converging to create immersive financial experiences, with the metaverse market expected to reach \$93.57 billion in 2027. This fusion is opening up new frontiers for customer engagement and decentralized financial services."

Connected Banking & Embedded Finance

- Better API Sandbox and SDK support
- PSD/4 and similar regulations will fuel innovation
- Contextual Banking & Embedded Financial Products

"Connected Banking and Embedded Finance are redefining financial access, with the embedded finance market projected to reach \$230 billion in revenue by 2025. This seamless integration of financial services into everyday experiences is driving unprecedented convenience and reach"

Opportunities with New Digital Public Infrastructure

National Health Stack (NHS)

A digital infrastructure initiative by the Indian government aimed at creating a unified and interoperable digital health ecosystem for the country. It is a key component of the National Digital Health Mission (NDHM), now known as Ayushman Bharat Digital Mission (ABDM). The NHS is designed to leverage technology to make healthcare more accessible, affordable, and efficient for all citizens.

Focus Areas

The NHS is not a single application but a set of digital building blocks or layers that can be used by various stakeholders to build digital health solutions. These building blocks include:

Health ID: A unique digital health ID for every citizen, acting as a single source of truth for individual health records.

DigiDoctor: A platform for doctors and healthcare providers to register and build their digital presence.

Consent Manager: A mechanism to manage patient consent for data sharing and access.

Personal Health Records (PHR): A system to enable individuals to access and manage their health records digitally.

Health Facility Registry (HFR): A comprehensive registry of all healthcare facilities in the country, both public and private.

Interoperability and APIs: Standards and APIs to ensure interoperability between different digital health systems and applications.

Potential Impact in Fintech

- **Health Insurance Innovation:**
NHS data enables Fintech to create personalized insurance products, improving risk assessment, claims processing, and fraud detection.
- **Healthcare Financing:**
Fintech can offer medical loans, device financing, and seamless payment solutions using NHS infrastructure.
- **Digital Payments:**
NHS can integrate secure digital payments for hospitals, clinics, and pharmacies, enhancing transaction efficiency.
- **Wellness & Prevention:**
Fintech can promote healthy behaviors with incentives, wellness tracking, and rewards linked to health outcomes.
- **Healthcare Savings & Investments:**
Platforms can offer health savings accounts, medical investment plans, and financial planning tools.
- **Financial Inclusion:**
Digital healthcare solutions can expand access to financial services, benefiting underserved populations.
- **Data & Insights:**
NHS data can help Fintech analyze spending patterns, identify financial needs, and create targeted products.

Opportunities with New Digital Public Infrastructure



Digital Ecosystem for Skilling and Livelihood Stack (DESH)

Digital Ecosystem for Skilling and Livelihood, is an initiative by the Indian government with an aim to create a unified framework to empower citizens in skilling, reskilling, and upskilling through online training. It will also provide API-based trusted skill credentials, payment and discovery layers to find relevant jobs and entrepreneurial opportunities.

Focus Areas

Trust Layer: Ensuring verified and portable credentials for education, skilling, work, and reputation.

Finance Layer: Facilitating easy access to finance and assessing creditworthiness.

Discovery Layer: Democratizing contextual and relevant information and creating a marketplace for skills and opportunities.

Potential Impact in Fintech

- **Digital Credentials:**
Streamlined verification for hiring and reduced fraud in Fintech operations
- **Financial Inclusion:**
Leveraging data for tailored financial products in the skilling ecosystem
- **Skill-Based Lending:**
Innovative lending products based on skill profiles and earning potential
- **Gig Economy Solutions:**
Fintech platforms catering to freelancers with verified skill credentials
- **Payments and Transactions:**
The integration of payment layers within DESH Stack can facilitate seamless transactions within the skilling and livelihood ecosystem.

National Logistics Stack (NLS)

The National Logistics Policy (NLP), is a comprehensive policy framework by the Indian government aimed at enhancing the efficiency of the logistics sector and reducing logistics costs in India. The National Logistics Stack (NLS) is a key digital component of this policy, designed to create a unified and integrated digital ecosystem for logistics.

Focus Areas

Digital Integration: Unifying systems across transport, commerce, and trade ministries

Unified Interface: ULIP acts as UPI-like framework for seamless cargo movement

Continuous Improvement: System Improvement Group monitors and ensures effective implementation of projects

Ease of Logistics: ELOG enhances transparency and accessibility in logistics

Potential Impact in Fintech

- **Supply Chain Finance:**
Leveraging enhanced data visibility for innovative financing solutions
- **Digital Payments:**
Integrating seamless payment processing across the logistics value chain
- **Working Capital Solutions:**
Utilizing NLS data for better risk assessment and tailored lending
- **Trust and Verification:**
Enhancing digital verification and fraud prevention in logistics finance

Opportunities with New Digital Public Infrastructure

Unified Energy Interface Stack (UEI)

An initiative aimed at creating an open and interoperable network that facilitates seamless data exchange and communication across India's energy ecosystem. UEI is inspired by the Unified Payments Interface (UPI) in the financial sector and seeks to replicate UPI's success in revolutionizing digital transactions within the energy domain.



Focus Areas

While still in development and conceptualization, UEI is expected to cover various aspects of the energy value chain, including:

Smart Metering: Facilitating seamless integration and data exchange from smart meters.

Grid Management: Enabling better grid monitoring and management through real-time data exchange.

Renewable Energy Integration: Supporting the integration of distributed renewable energy resources.

Electric Vehicle (EV) Charging Infrastructure: Streamlining data exchange and interoperability across EV charging networks.

Energy Trading and Markets: Potentially enabling more efficient and transparent energy trading platforms.

Potential Impact in Fintech

Digital Payments and Analytics:

Fintech companies can develop innovative payment solutions integrated with UEI for electricity bills and EV charging. Advanced analytics tools can help consumers and businesses optimize energy consumption and access tailored financial products.

Renewable Energy Financing:

As UEI supports the growth of renewable energy, Fintech can play a crucial role in providing financing solutions for rooftop solar installations, community solar projects, and EV infrastructure development.

Energy Trading and Blockchain:

Fintech companies specializing in blockchain and DeFi could explore applications in energy trading, facilitating peer-to-peer energy transactions and tokenized energy assets, leveraging the transparent and efficient platforms enabled by UEI.



Opportunities with New Digital Public Infrastructure

Finternet (as Coined by Nandan Nilekani at BIS)

This interpretation of "Finternet" specifically refers to a concept advocated by Nandan Nilekani, a key architect of India Stack, in the context of global digital public infrastructure and interoperable payment systems, particularly discussed at platforms like the Bank for International Settlements (BIS).

Focus Areas

Interoperability: Ensuring different digital systems and payment rails can communicate and transact with each other across borders.

Open Standards and APIs: Using open standards and APIs to facilitate interoperability and innovation.

Trust and Security: Maintaining trust and security in cross-border digital transactions.

Inclusion: Promoting financial inclusion on a global scale by making digital services accessible to more people across different countries.



Potential Impact in Fintech

New Markets for Fintechs:

The 'Finternet' unlocks global opportunities in cross-border payments, remittances, and financial platforms.

Cross-Border Payment Innovation:

Fintechs can create interoperable solutions across national digital infrastructure, driving seamless international transactions—an essential factor in enhancing cross-border connectivity and efficiency.

RegTech & Compliance:

Fintechs play a crucial role in ensuring security and compliance in global transactions.

Global Expansion:

Finternet enables fintechs to scale internationally by leveraging strategic partnerships to enhance their offerings and expand their global reach.

Investment in Infrastructure:

The 'Finternet' is set to drive major investments in secure cross-border fintech solutions.

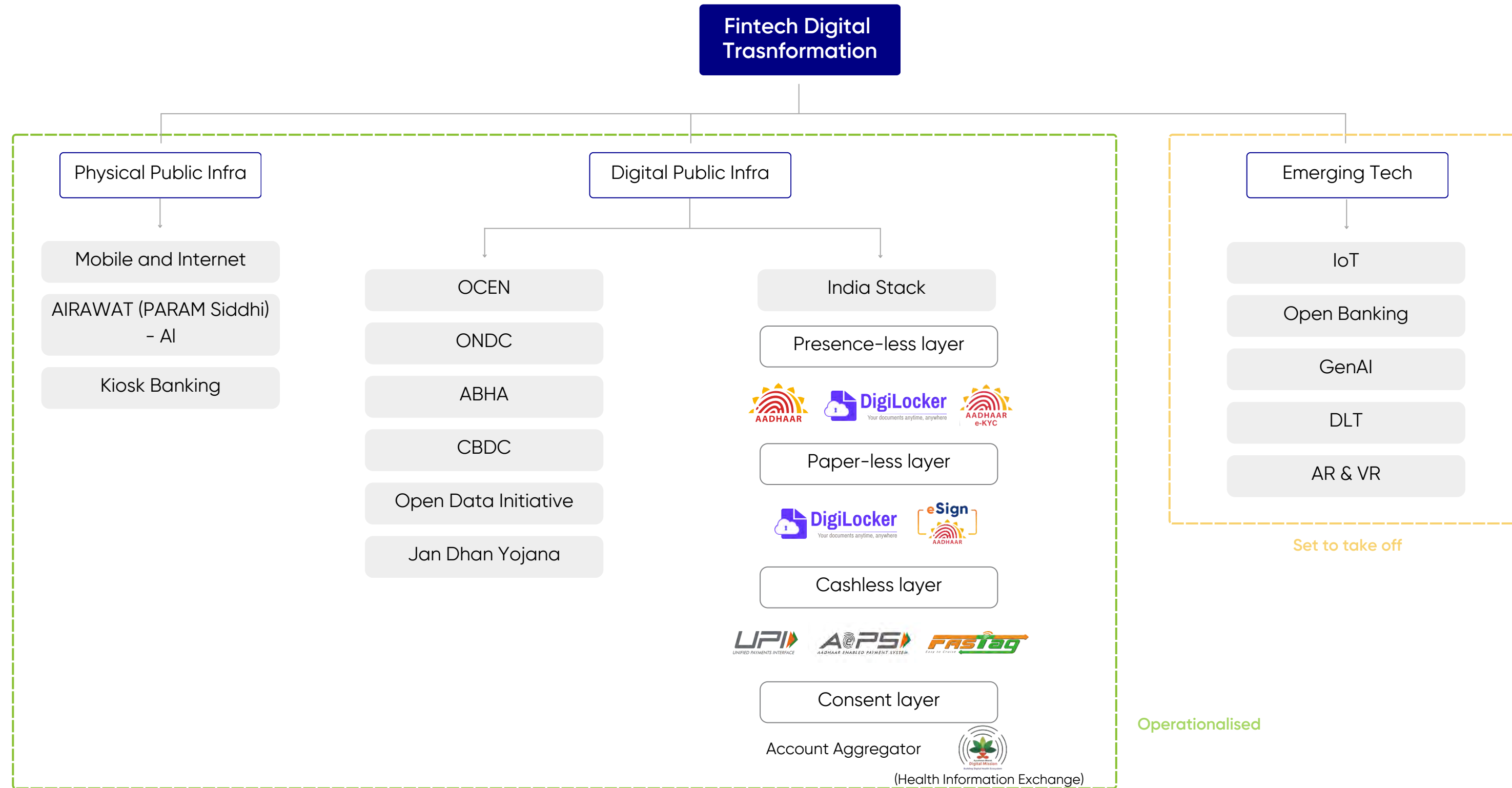




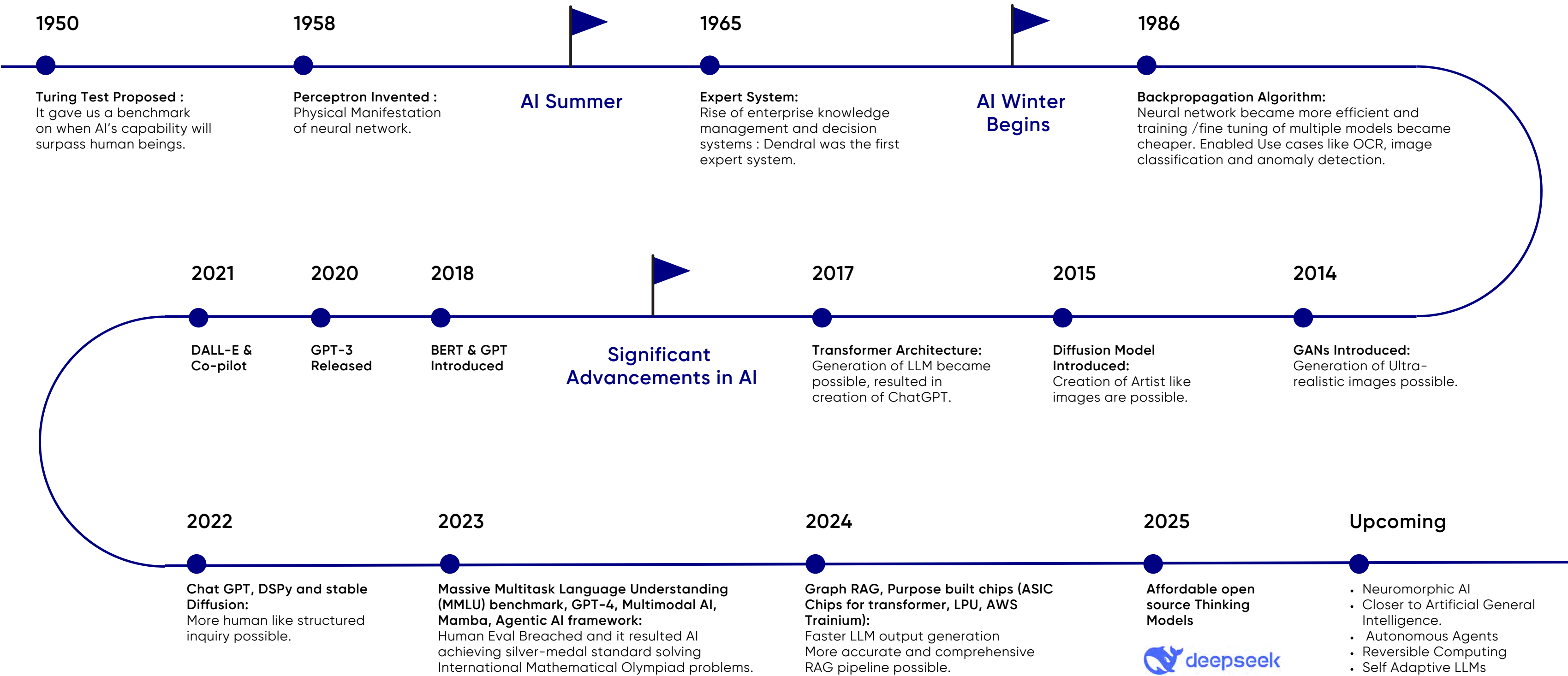
Evolution of Technologies in Fintech

Beyond Public Infra

Technology to revolutionise fintech and BFSI



Evolution of AI



APIs: Critical Component of Microservices Architecture



By leveraging APIs, fintech companies can rapidly innovate, scale their operations, and deliver enhanced value to customers while maintaining security and regulatory compliance.

Here's a concise overview of how APIs are critical to modern fintech systems across various use cases:



Embedded Finance:

- Enable non-financial companies to integrate financial services seamlessly
- Power "Buy Now, Pay Later" options and in-app payments
- Facilitate embedded insurance and investment products



Digital Lending:

- Enable automated loan origination and underwriting processes
- Facilitate alternative credit scoring using non-traditional data
- Support peer-to-peer lending platforms



Open Banking:

- Allow secure sharing of customer financial data between banks and third parties
- Enable account aggregation and personal financial management tools
- Support innovative services like automated savings and budgeting apps



Security and Fraud Prevention:

- Enable real-time identity verification and KYC processes
- Facilitate multi-factor authentication and biometric security measures
- Support AI-powered fraud detection and prevention systems



Payments:

- Enable real-time payment processing and fund transfers
- Power digital wallets and contactless payment solutions
- Facilitate cross-border transactions and currency conversions



Capital Markets:

- Enable real-time market data feeds and order execution
- Facilitate algorithmic trading and portfolio management
- Support regulatory reporting and compliance



Neobanking:

- Provide core banking functionalities to digital-only banks
- Enable rapid deployment of new features and services
- Support integration with third-party services for enhanced offerings



Personalization and Analytics:

- Enable AI-driven personalized financial advice and product recommendations
- Facilitate big data analytics for risk assessment and market insights
- Support predictive modeling for investment strategies



InsurTech:

- Enable real-time policy quotes and automated underwriting
- Facilitate claims processing and fraud detection
- Support usage-based insurance models

Benefits of Microservices Architecture



Monolithic (challenges)	vs	Microservice (benefits)
Scaling requires scaling the entire application, even if only specific components need it	Scalability	Independent scaling of individual services based on demand. AWS Auto Scaling and Amazon Elastic Container Services enable efficient scaling for fintech workloads
Slower development cycles due to the complexity of the entire system	Development Speed	Faster development and deployment of new financial products and services. AWS CodePipeline enables continuous delivery for individual services
Limited to a single technology stack, hindering adoption of new fintech innovations	Technology Stack	Freedom to use different technologies for different services. AWS supports multiple programming languages and frameworks, enabling integration of cutting-edge fintech solutions
A bug in any module can potentially bring down the entire financial system	Fault Isolation	Failures are isolated to individual services. AWS services like ECS and Lambda provide isolation between services, crucial for maintaining financial operations
Updating for new regulations requires changes to the entire system	Regulatory Compliance	Easier to update specific services to comply with new financial regulations without affecting the entire system
Typically uses a single, shared database, leading to potential bottlenecks in high-volume financial transactions	Data Management	Each service can have its own purpose built database, optimized for its specific financial data needs. AWS offers various database services (RDS, DynamoDB) for different use cases

Benefits of Microservices Architecture



Monolithic (challenges)	vs	Microservice (benefits)
A security breach can compromise the entire system	Security	Improved security isolation, critical for protecting sensitive financial data. AWS IAM allows fine-grained access control for different teams and services
Difficult to integrate with legacy financial systems	Legacy System Integration	Easier to create microservices that act as interfaces to legacy systems, facilitating modernization of fintech infrastructure
Recovery involves the entire system, potentially leading to longer downtimes	Resilience & Disaster Recovery	Faster recovery of individual services, crucial for maintaining business continuity in financial operations
Difficult to pinpoint issues in a large, interconnected system	Monitoring and Debugging	Easier monitoring of individual services. AWS CloudWatch and X-Ray provide detailed monitoring and tracing, critical for maintaining high availability in financial systems
API changes affect the entire application	API Management	Amazon API Gateway allows for easy management and versioning of APIs for different financial services, crucial for open banking initiatives
Difficult to attribute costs to specific features or products	Cost Management	Easier to track costs for individual services. AWS Cost Explorer enables detailed cost analysis for fintech products

When is Monolithic a better choice than Microservice-based Architecture?

Monolithic architecture can be suitable for high-performance workloads under certain conditions.

Here are some points to consider:

Performance Advantages:



- Monolithic architectures can offer high performance due to shared-memory access, which is faster than inter-process communication (IPC) used in micro services.
- This can be beneficial for workloads that require quick data access and minimal latency.

Simplicity and Efficiency:



- The simplicity of having a single codebase can lead to more efficient execution since all components run within the same process.
- This reduces the overhead associated with managing multiple services and can enhance performance for certain types of applications.

Better Resource Utilization:

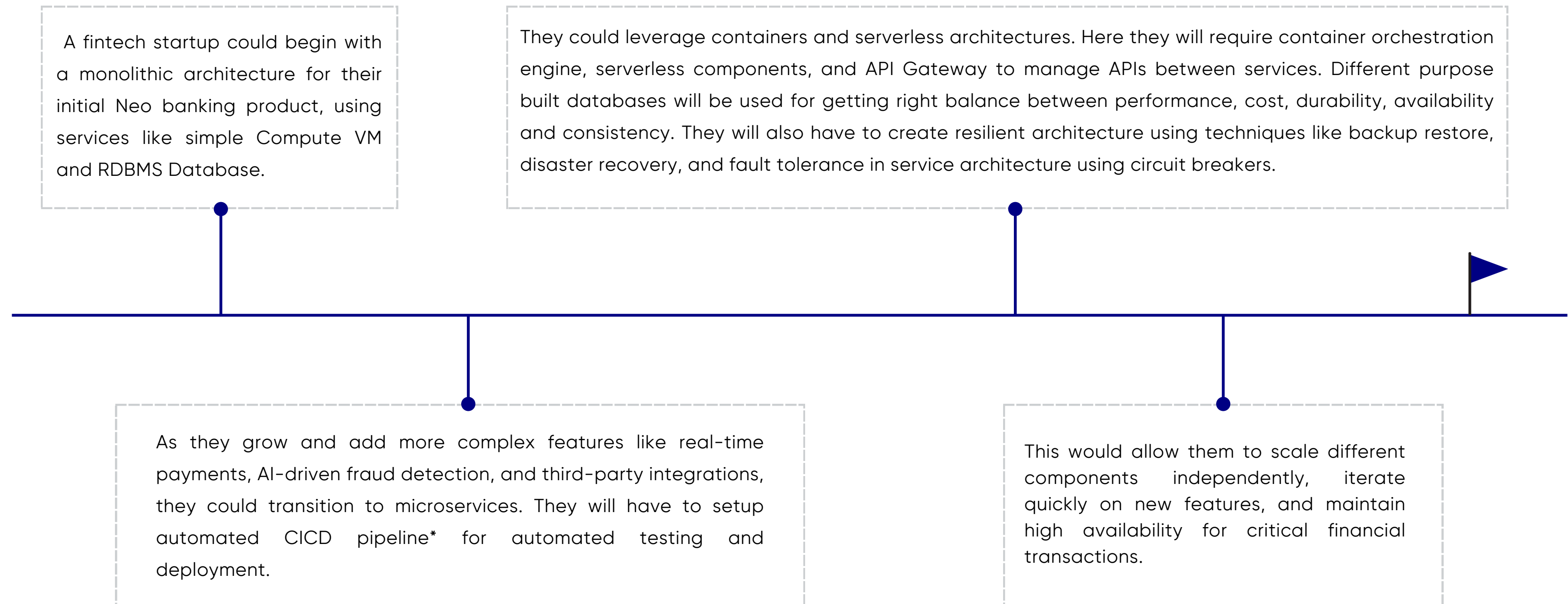


- In a monolithic setup, all resources are shared, which can lead to efficient use of available hardware, especially when the application is not highly modularised or does not require independent scaling of components.

So if you are a Fintech, when will you use monolithic architecture in real life:

- You're launching a new fintech product or MVP and need to get to market quickly
- Your application has relatively simple business logic and limited scalability needs
- You have a small development team with limited microservices expertise
- Your fintech product handles sensitive financial data that requires strict consistency and security controls
- You need to minimize operational complexity and costs in the early stages
- Your application doesn't require frequent updates or independent scaling of components

Journey from Monolith to Microservice



*CI/CD pipeline: CI/CD pipeline (Continuous Integration/Continuous Delivery or Deployment pipeline) is a series of automated processes that streamline the software development lifecycle, enabling teams to build, test, and deploy code efficiently and reliably. It is a key practice in DevOps aimed at improving software quality and delivery speed.

Freecharge: Transforming Digital Payments on AWS



Use Case:

Modernizing application stack from monolithic to microservices to improve market competitiveness

- Digital payments company wholly owned by Axis Bank
- Offers digital wallet, lending solutions, consumer credit card, merchant services, and online payment gateway
- Serves 100 million registered users across India

Problem Statement

Need to innovate solutions for easier financial services

Reduce IT costs and administration

Accelerate time-to-market for new offerings

Improve disaster recovery while complying with regulations

Solution

Migrated to Amazon EKS for Kubernetes management:

- 22% reduction in AWS costs
- Deployment time reduced from hours to minutes
- Multiple software releases daily

Moved disaster recovery to AWS Asia Pacific (Hyderabad) Region:

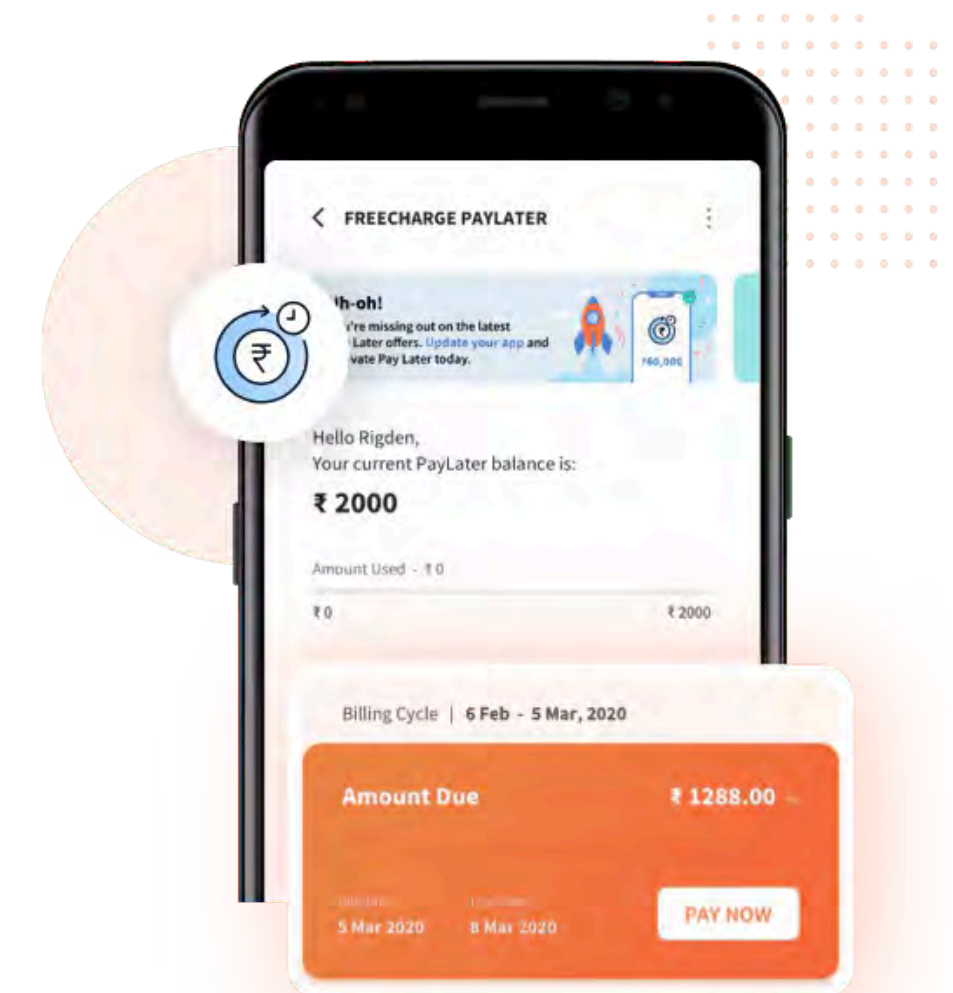
- 50% lower DR costs
- 10-15% reduction in administrative time per DR drill
- Compliant with RBI regulations

Overall benefits:

- Launched consumer lending platform in 45 days
- Accelerated product launches (payment gateways, cash advance solutions)
- Prepared for 4-5x usage increase without proportional IT cost rise
- Improved support through AWS Enterprise Support

Switched from Aerospike to Amazon DynamoDB*:

- 60% reduction in session data storage costs
- Simplified database scaling



*Amazon Elastic Kubernetes Service (Amazon EKS) is a fully managed service provided by AWS that simplifies the deployment, management, and scaling of Kubernetes clusters. Aerospike is a high-performance, open-source NoSQL database designed for real-time, large-scale data management. Amazon DynamoDB is a fully managed, serverless NoSQL database service provided by AWS

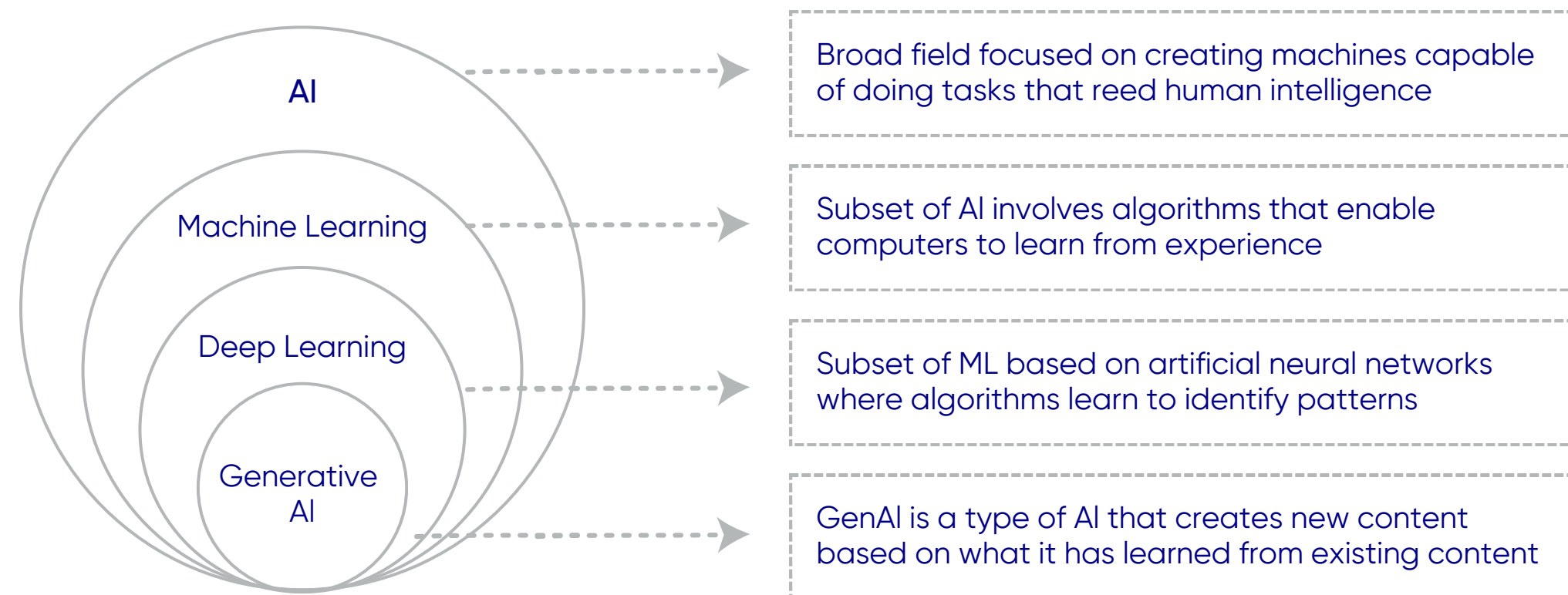
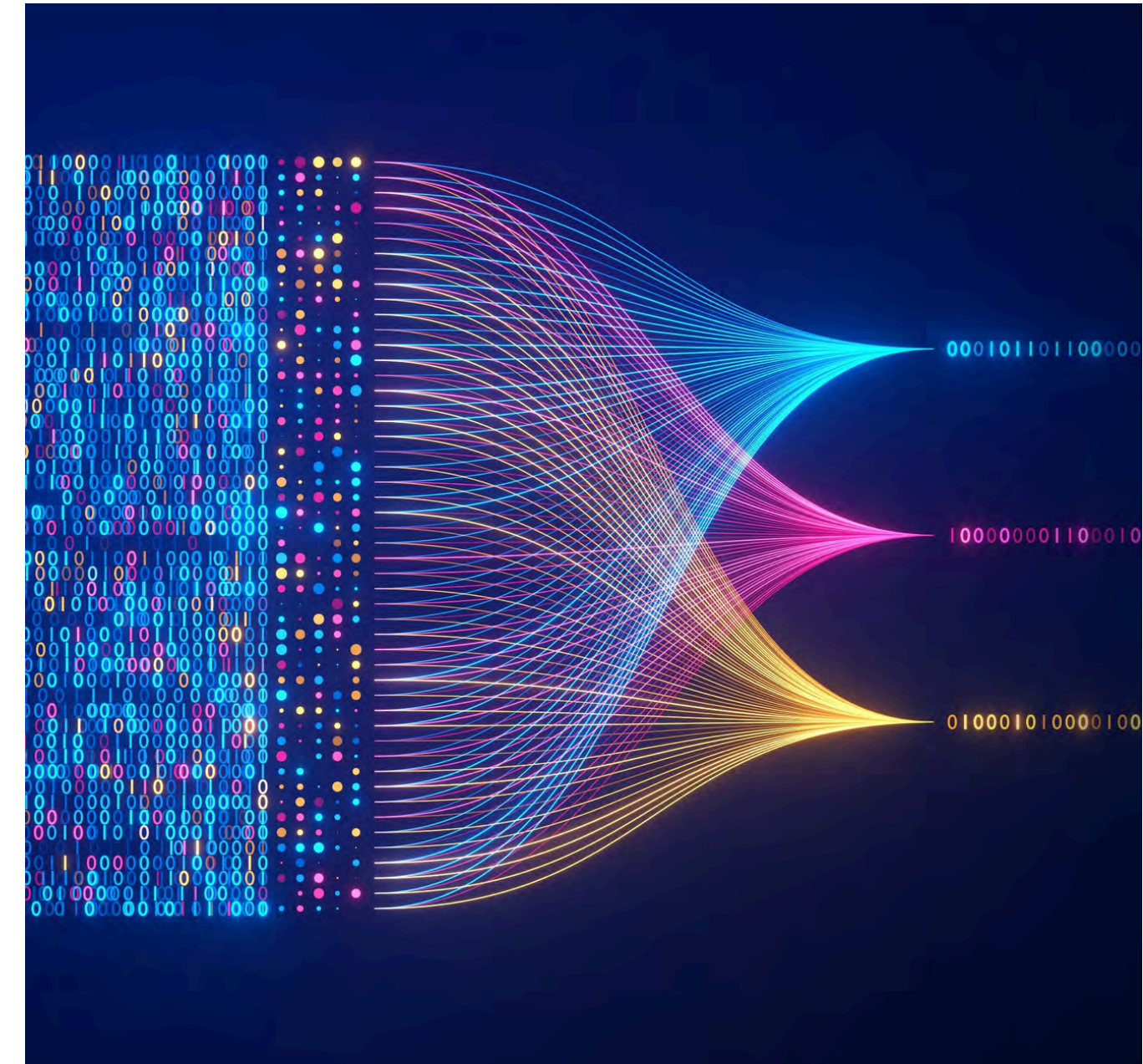


Gen AI

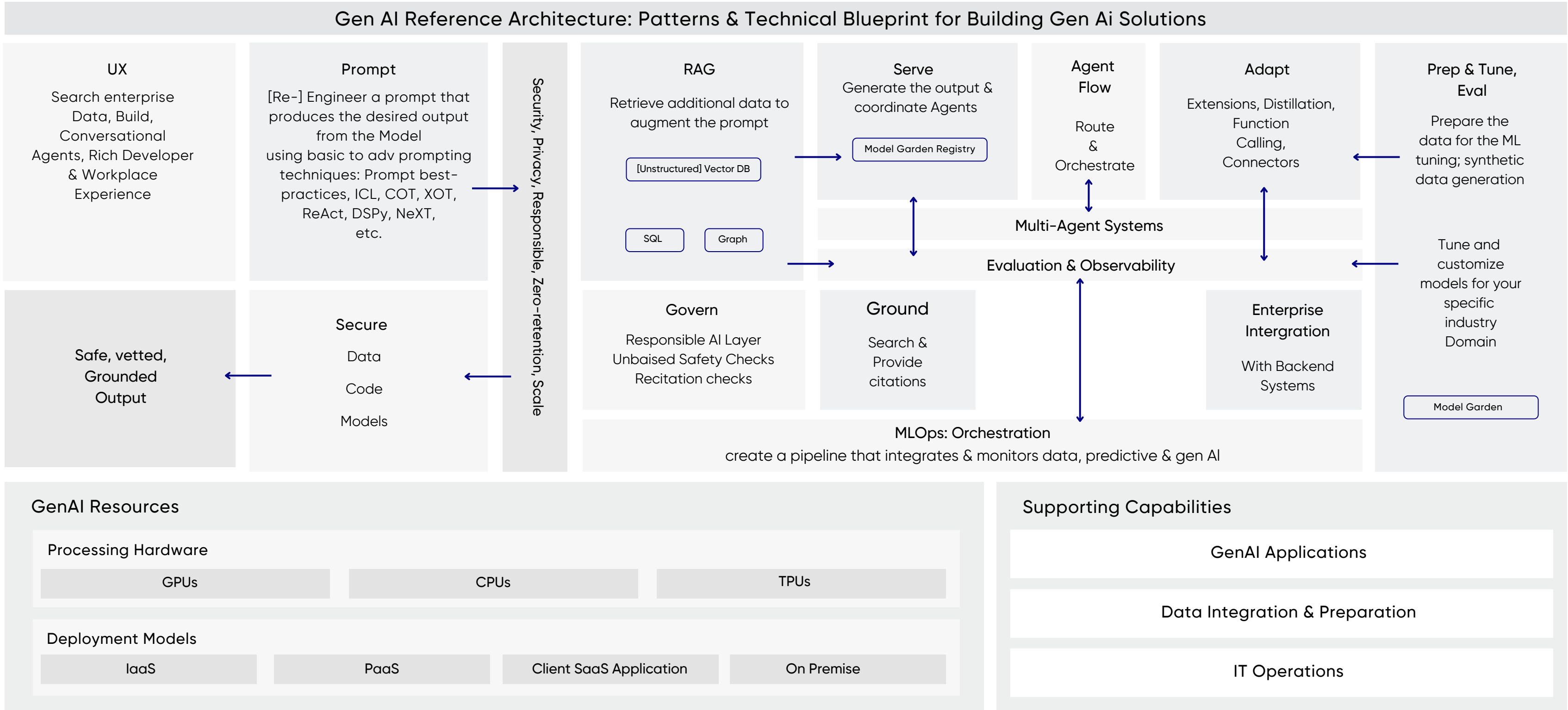
Generative AI is Powered by Foundation Models

- Pretrained on vast amounts of unstructured data
- Contain large number of parameters that make them capable of learning complex concepts
- Can be applied in a wide range of contexts
- Customize Foundation Model using your data for domain specific tasks

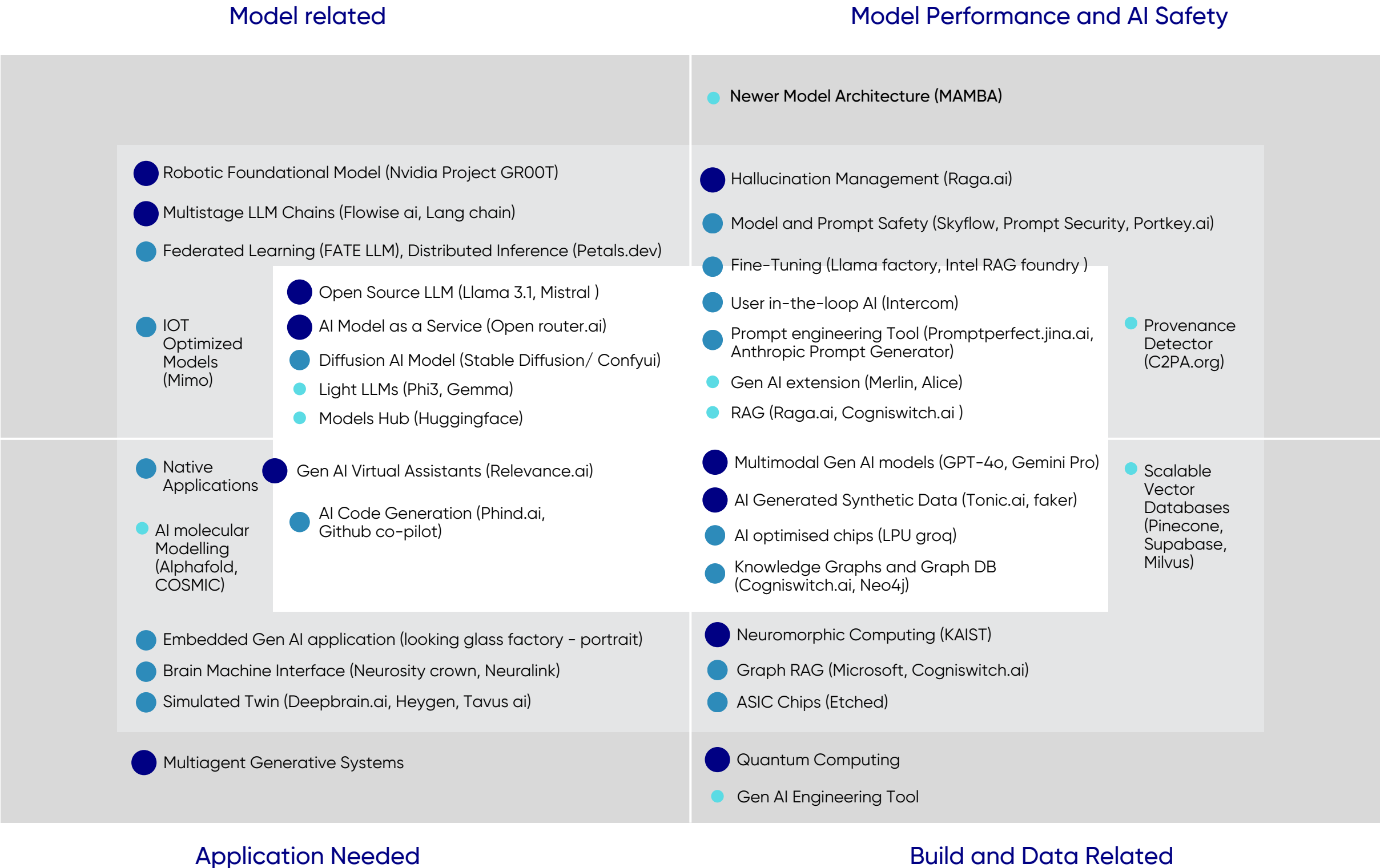
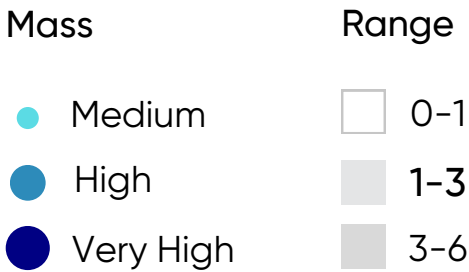
What is Generative AI



Gen AI Architecture



Gen AI Impact Radar



Large Language Models



Companies	Model	When to Use	Strengths	Weaknesses
OpenAI	O1	Response not an issue and complex reasoning is required	Ability to reason step by step for more complex task	Takes time to process user query
	GPT-4o	General language understanding, creative text generation	Multimodal capabilities, fast response times, elite scores in language tasks	More expensive, struggles with strict instruction adherence
	GPT-4o Mini	Faster, cost-effective applications, real-time interaction	Cost-effective, versatile in general language tasks	Smaller context window, weaker in complex tasks
ANTHROPIC	Claude 3.5 Sonnet	Coding, context-sensitive customer support, multi-step workflows	Superior coding, large context window (200K), fast and cost-effective	Latency lags behind GPT-4o, less versatile in multimodal tasks
	Claude Opus	Multimodal tasks (text, images, audio)	Strong multimodal capabilities, high language quality	Slower than competitors, higher cost

Large Language Models



Companies	Model	When to Use	Strengths	Weaknesses
	Gemini 2.0 Flash	Real-time applications, multimodal tasks, and agentic experiences	<ul style="list-style-type: none">Low Latency and Enhanced Performance: Optimized for speed, making it suitable for applications requiring quick responses.Multimodal Capabilities: Supports inputs like text, images, video, and audio, with plans for multimodal outputs including image and audio generation.Native Tool Use: Integrates seamlessly with tools like Google Search and code execution environments.	Experimental Features: Some capabilities, such as multimodal output and advanced reasoning ("Flash Thinking"), are still in experimental stages.
	Gemini 1.5 Pro	Multimodal understanding, creative writing	Excels in visual tasks, human-like writing, creative suggestions	Struggles with advanced coding, less comprehensive data extraction
	Qwen 2.5 Max	High-performance tasks, especially in Chinese language processing	<ul style="list-style-type: none">Benchmark Excellence: Outperforms models like DeepSeek-V3 and Meta's Llama 3.1 in key benchmarks.Mixture-of-Experts Architecture: Enhances scalability and efficiency in processing.Extensive Model Family: Offers a range of models, including open-source versions, catering to diverse applications.	<ul style="list-style-type: none">Proprietary Restrictions: Some advanced models remain closed-source, limiting accessibility for broader research and development.Potential Regional Bias: Optimized primarily for Chinese language tasks, which may affect performance in other languages.

Large Language Models



Model	Model	When to Use	Strengths	Weaknesses
	Deepseek – R1	Tasks requiring advanced reasoning, mathematical problem-solving, and real-time analysis	<ul style="list-style-type: none">• Reinforcement Learning Optimization: Trained using reinforcement learning techniques, leading to superior performance in logical inference and mathematical reasoning.• Cost-Effective Development: Achieves high performance at a fraction of the development cost of competitors.• Open-Source Commitment: Released under the MIT license, promoting transparency and collaborative development.	<ul style="list-style-type: none">• Content Moderation: Implements censorship on topics deemed sensitive under Chinese regulations.• Training Data Limitations: Specifics about the training data are not fully disclosed, which may impact reproducibility.
	Deepseek – V3	Open-source AI development, cost-effective large-scale model training	<ul style="list-style-type: none">• Resource Efficiency: Trained with significantly fewer resources compared to peers, utilizing approximately 2,000 Nvidia H800 chips over 55 days at a cost of \$5.58 million.• Competitive Performance: Matches or surpasses models like GPT-4o and Claude 3.5 Sonnet in benchmarks, despite lower training costs.• Open-Source Accessibility: Available under the MIT license, allowing free use and modification.	<ul style="list-style-type: none">• Censorship Mechanisms: Incorporates content moderation, especially on topics sensitive to Chinese regulations.• Limited Training Data Transparency: While the model is open-source, the training dataset details are not fully disclosed.

Large Language Models

Companies	Model	When to Use	Strengths	Weaknesses
	Grok-3	Complex reasoning tasks, advanced coding, and real-time data analysis	<ul style="list-style-type: none">Advanced Reasoning: Features "Big Brain" mode for complex problem-solving, capable of breaking down intricate questions into manageable tasks.DeepSearch Integration: Offers a smart search engine capable of conducting detailed research and articulating its thought process.	Limited Guardrails: Fewer content moderation filters, which could lead to inappropriate or biased outputs.
 Microsoft	Phi-3	Resource-constrained devices, low-latency applications	Compact, efficient, optimized for resource-constrained environments (e.g., mobile, IoT), strong reasoning	Limited factual knowledge in large datasets, mainly optimized for English
 Meta	Llama 3.3	Research, general-purpose NLP, multilingual – multimodal tasks	Open-source, massive training data, strong performance on NLP and sentiment tasks	More resource-intensive, slower than smaller models like Phi-3 in some benchmarks
Bloomberg	BloombergGPT	Financial services, market analysis, economic forecasting	Highly accurate in financial tasks	Less versatile for general-purpose tasks

Financial Domain LLMs



Year 2019, 2020, 2021

Parameters 0.11 Bn

FinBERT is a specialized natural language processing (NLP) model designed for analyzing sentiment in financial texts. FinBERT is primarily used for sentiment classification, providing outputs that categorize text as positive, negative, or neutral. This is particularly useful for analyzing sentiments in financial reports, news articles, and social media related to finance. The model was fine-tuned using datasets like the Financial PhraseBank, which contains sentences labeled for sentiment, ensuring its relevance and accuracy in financial sentiment analysis.



Year 2023

Parameters 50 Bn

Bloomberg GPT (BloombergGPT) is a large language model (LLM) developed by Bloomberg that is specifically designed for the financial domain. BloombergGPT is a 50-billion parameter decoder-only causal language model trained on a dataset of over 700 billion tokens, with approximately half coming from financial data sources and the other half from general-purpose datasets. BloombergGPT improves risk assessments in finance by offering advanced data analysis, sentiment analysis, real-time insights, and customizable features, enabling financial professionals to make more informed and timely decisions.



Year 2023

Parameters 7B, 30Bn

FinMA is a large language model (LLM) developed specifically for the financial domain as part of the PIXIU project. FinMA is designed to understand complex financial language and concepts, and is fine-tuned to follow natural language instructions, enhancing its performance in downstream financial tasks.

Three versions of FinMA have been developed: FinMA-7B, FinMA-7B-full, and FinMA-30B.

FinMA, can perform a variety of tasks such as sentiment analysis, named entity recognition, txt summarization, data extraction from unstructured financial texts, question answering, multi-turn conversations, etc. However, for financial prediction tasks like stock movement prediction it struggles mainly due to the inherent unpredictability and multifactorial nature of financial markets.

Financial Domain LLMs

InvestLM



Year 2023

Parameters 65 Bn

InvestLM, a new financial domain large language model with 65 Billion parameters, tuned on [LLaMA](#), using a carefully curated instruction dataset related to financial investment. InvestLM is specifically designed for tasks related to financial investment, such as providing investment advice (based on financial text), summarizing earnings transcripts, extracting information from analyst reports, and more.



Year 2023

Parameters 7 Bn

FinGPT is an open-source framework developed by researchers at Columbia University and New York University that aims to democratize access to high-quality financial data and stimulate innovation in financial applications using large language models (LLMs). FinGPT takes a data-centric approach, recognizing the importance of high-quality data for the success of financial LLMs. It provides an end-to-end framework with four layers: data source, data engineering, LLMs, and applications. FinGPT can be deployed on the cloud or other systems.

FinanceLLM

Year 2024

Parameters 7 Bn

The Finance-LLM is a domain-specific language model developed by [AdaptLLM](#) using the method described in their ICLR 2024 paper "Adapting Large Language Models via Reading Comprehension". This model is based on the LLaMA-1-7B backbone and has been further pre-trained on finance-focused corpora. By transforming the pre-training data into a reading comprehension format, the model is able to maintain strong prompting performance while gaining valuable domain knowledge.

The finance-LLM model is capable of understanding and generating finance-related text. It can be used for tasks like financial analysis, report writing, and even answering finance-related questions. The model's strong prompting performance allows it to be effectively fine-tuned for various finance-focused applications.

AI Hallucinations

What is Hallucination?

LLM hallucination refers to instances where a large language model (LLM), though not intentional, generates responses that are inaccurate, irrelevant, or completely fabricated. Despite the confident and coherent nature of these responses, they lack grounding in the model's training data or the context of the inquiry. This phenomenon is considered one of the emergent properties of LLMs, reflecting their tendency to predict and produce plausible-sounding but unsubstantiated information.

Types Of Hallunication

- ✓ Input-Conflicting
- ✓ Context-Conflicting
- ✓ Fact-Conflicting
- ✓ Forced - Jailbreak*

When LLM is most likely to Hallucinate

Specialized and niche topics:

When asked about highly specific or lesser-known subjects, the model may fabricate details due to limited or imprecise training data.

Lack of sufficient training data:

When a question involves recent developments or facts not covered in the training data (e.g., events after the model's training period).

Complex multi-step reasoning & Computation:

In tasks that require intricate logic or detailed calculations, the model might produce incorrect or inconsistent conclusions as LLM as just a token prediction engine.

Foreign language queries:

If the model is less proficient in a language, it might generate incorrect translations or facts.

Open-ended questions:

Vague or broad questions can lead the model to generate speculative or unsupported information.

Creative tasks:

When asked to invent names, facts, or stories, the model may generate completely made-up content.

*Note: A forced jailbreak is a human induced technique that manipulates an AI model into generating harmful or inappropriate content.

Cases of Hallucinations

The Guardian

Air Canada ordered to pay customer who was misled by airline's chatbot

Company claimed its chatbot 'was responsible for its own actions' when giving wrong information about bereavement fare

Forbes

FORBES > BUSINESS

BREAKING

Lawyer Used ChatGPT In Court—And Cited Fake Cases. A Judge Is Considering Sanctions

Molly Bohannon Forbes Staff
Molly Bohannon has been a Forbes news reporter since 2023.

Follow



Jun 6, 2023, 10:08pm EDT

INDIA TODAY

ChatGPT falsely accuses US law professor of sexually harassing a student, invents a news article

A Law Professor at George Washington University penned a blog post revealing how ChatGPT wrongly accused him of sexually harassing a female student based on a news article that had never been written in the first place.

Meta's Galactica Model Taken Offline Due to Hallucination Issues, LeCun Expresses Regret



站长之家

Published in AI News · 2 min read · Nov 15, 2023

The Guardian

Google AI chatbot Bard sends shares plummeting after it gives wrong answer

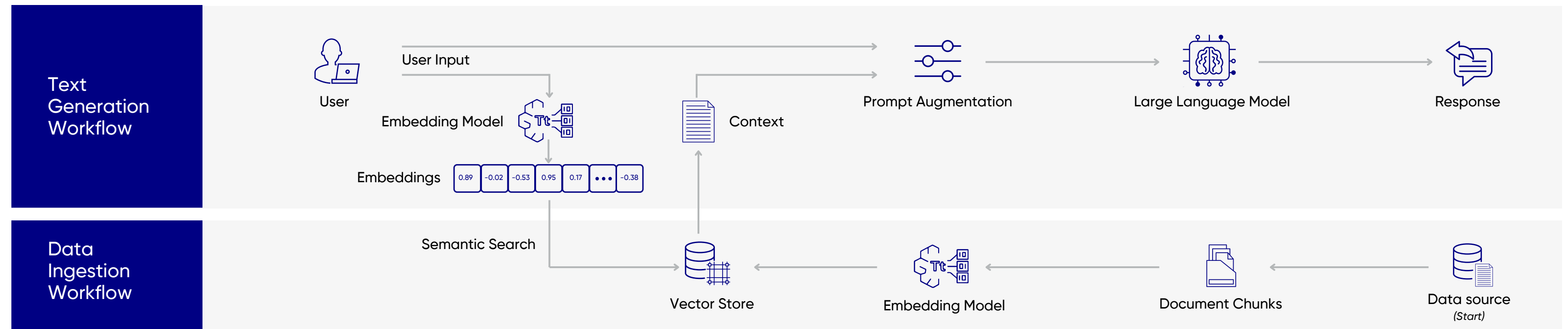
Chatbot Bard incorrectly said James Webb Space Telescope was first to take pictures of planet outside Earth's solar system

How to Overcome Hallucinations

Large language modeling techniques to minimize hallucinations

- ✓ **Fine tuning:**
When asked about highly specific or lesser-known subjects, the model may fabricate details due to limited or imprecise training data.
- ✓ **Retrieval-augmented generation (RAG):**
Give the model specific documents to reason over to limit the context available.
- ✓ **Multi-shot:**
Provide model multiple examples of both the input as well as expected output.
- ✓ **Thinking step-by-step:**
Give the model hints to work in a step-by-step manner towards an output objective.
- ✓ **Assigning roles:**
Tell the model its role or who it is within the situation.

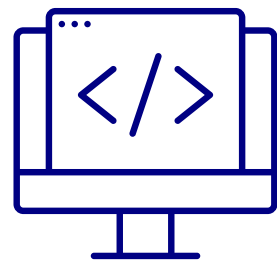
Example Financial Services Customer RAG Architecture



Use Cases Across Traditional & Generative AI

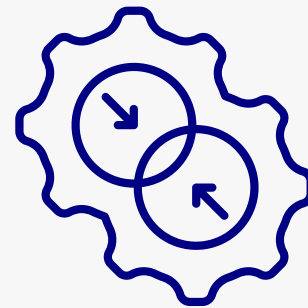
Financial institutions are leveraging both "Traditional" AI/ML and Generative AI to address critical business priorities

Use Case Examples



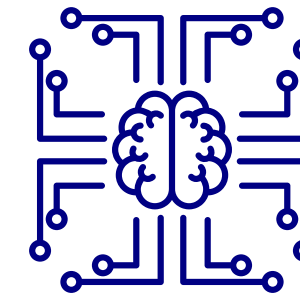
Traditional AI/ML

- Customer onboarding
- Algorithm trading
- Credit decisioning
- Predicting customer churn
- "Next best action" recommendations



Enhanced capabilities using a combination of traditional & generative AI

- Loan and claim application processing
- Financial crime
- Call center intelligence
- Data extraction from unstructured text



Generative AI

- Hyper-personalized messaging to customers
- Virtual assistants for customer support and servicing
- Search, summarization and insights for analysts and underwriters
- Augmenting Code development
- No code data visualization

Movement from Traditional AI to Gen AI



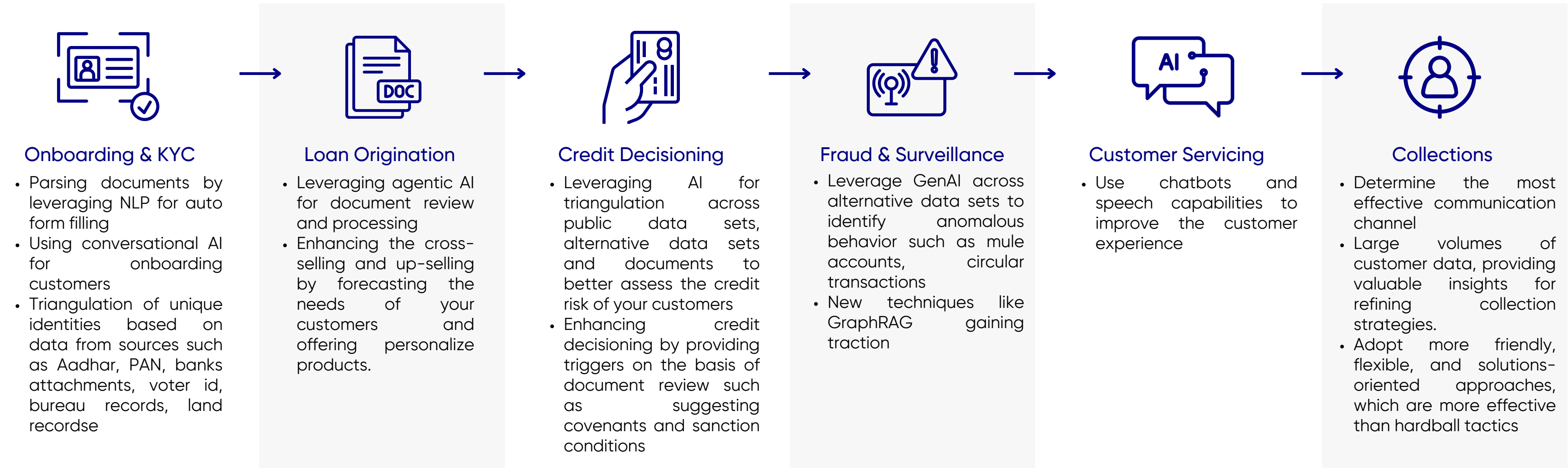
Traditional AI	vs	Gen AI
Forecasts outcomes based on historical data	Primary Function	Creates new content or data based on patterns learned from training data
Numerical predictions, classifications, or recommendations	Output Type	Text, images, code, or other content types
Structured, labeled data	Data Requirements	Can work with both structured and unstructured data
Credit scoring, fraud detection, risk assessment, customer churn prediction, Transaction anomaly detection, stock price prediction, loan approval automation	FSI/Fintech Use Cases	Personalized financial advice, automated report generation, customer service chatbots, AI-powered personal finance assistants, automated investment summaries, code generation for financial algorithms
Generally simpler, more interpretable models	Model Complexity	Complex, often less interpretable models like large language models (LLMs)
Well-established frameworks for model validation and explainability	Regulatory Compliance	Emerging challenges in hallucination, explainability and bias mitigation, requiring careful governance

Movement from Traditional AI to Gen AI



Traditional AI	vs	Gen AI
Can work with anonymized or aggregated data	Data Privacy	May require more robust data protection measures due to potential for generating sensitive information
Typically faster to develop and deploy	Time to Implement	May require more time for fine-tuning and prompt engineering
Generally lower compute costs. Simplified and more matured services. E.g. – You can use highly scalable services like Amazon SageMaker, Amazon Forecast, Amazon Fraud Detector	Cost Considerations	Higher compute costs, especially for large model training and inference. Emerging and scalable service but require more compute power. E.g. You can use highly scalable services like Amazon EC2 GPUs, Amazon Bedrock, Amazon Q, Amazon SageMaker Jumpstart
Often requires domain-specific feature engineering	Customization for FSI	Can be fine-tuned on financial data for industry-specific tasks
Well-suited for real-time predictions using services like Amazon Kinesis	Real-time Processing	Can handle real-time interactions, but may have higher latency for complex generations

How Generative AI is Applied in Lending

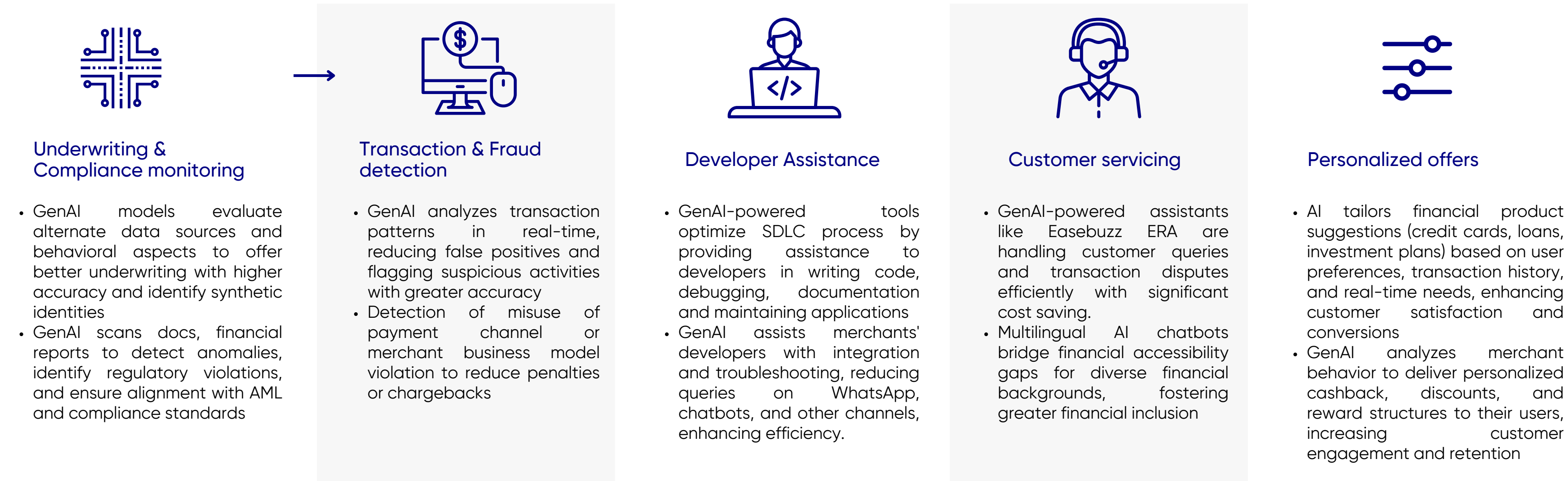


Impact

Reduction in OpEx and increase of productivity, time to makert is crunched, and opening up of newer channel for distribution	Increase in first time right ("FTR") i.e. checking whether the entire loan application file is complete before decisioning	Faster and better credit decisioning, has almost reduced TAT by 75%	Reduction in wilful defaults	Reduction in human efforts for closing customer tickets and therefore resulting in better customer satisfaction	Reduction in NPAs
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Source: Industry experts

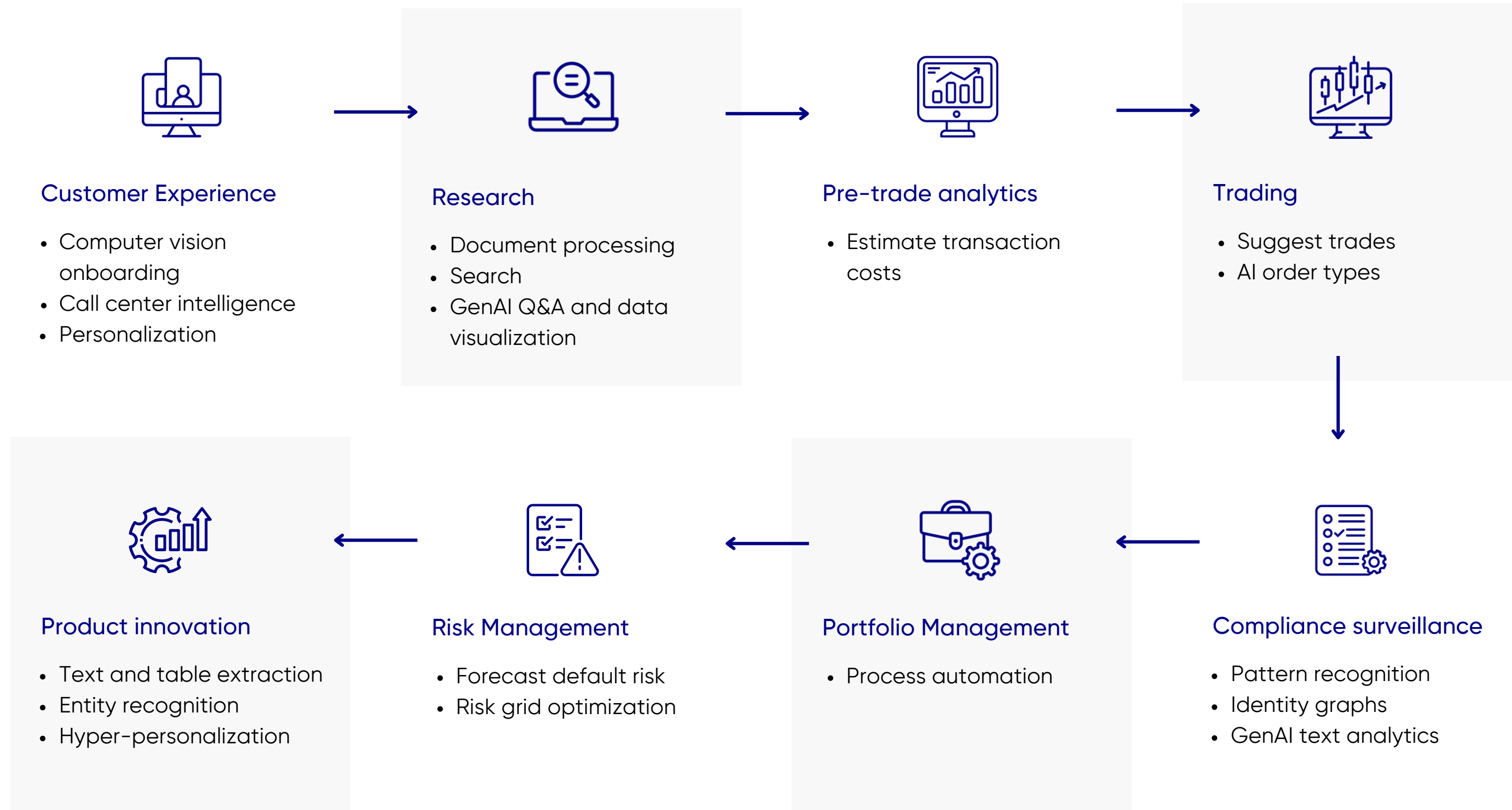
How Generative AI is applied in Payments



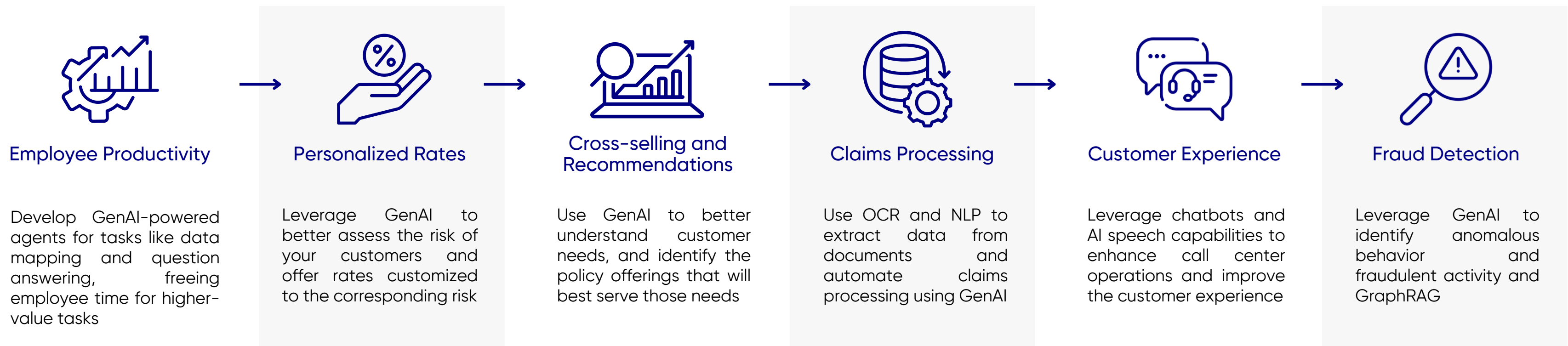
Impact

GenAI-driven underwriting models and case screening reduced false positives by 60%, allowing analyst to focus on real threats	15% operational efficiency with improved speed and reduced cost	Internal co-pilots improve the developer efficiency 55% and code review pace by 40 %	20% higher customer satisfaction with 40% improved in query TAT adherence	Higher customer satisfaction and retention
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Generative AI across the Capital Markets Trade Life Cycle



How Generative AI is Applied in Insurance



Impact

40% productivity gains	8-10% impact on cost reduction as a result of underwriting	10-15% increase in potential revenue	3-4% reduction in claims payout and 20-30% reduction in loss-adjustment expenses	Higher NPS. Difficult to quantify impact given that NPS is multi-factorial	20-40% increase in detection, 5-10% reduced claim costs, and up to 50% faster processing times
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Source: Industry experts

Key AI/ML and Generative AI Considerations

Monitor the evolving legal and regulatory landscape



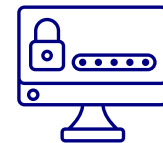
Global industry groups such as the Organization for Economic Co-operation and Development (OECD) and regulatory groups (such as the SEC) are developing rules and regulations around AI.

Consider establishing governance and compliance guidelines



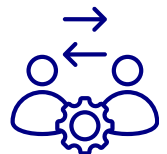
Guidelines may include: Acceptable use of enterprise AI services, output validation, monitoring and compliance reporting, and alignment with regulatory requirements.

Address legal and privacy requirements



Consider how prompts and outputs are protected when using a third-party model, understand the ownership and copyright challenges with training data, and avoid PII when training data.

Choose the right approach for specific business challenges



Consider if inputs/outputs are structured or unstructured, explainability level of model results, if a human-in-the loop is feasible, and cost-benefit analysis for model sizes and accuracy thresholds.

GenAI Case Studies

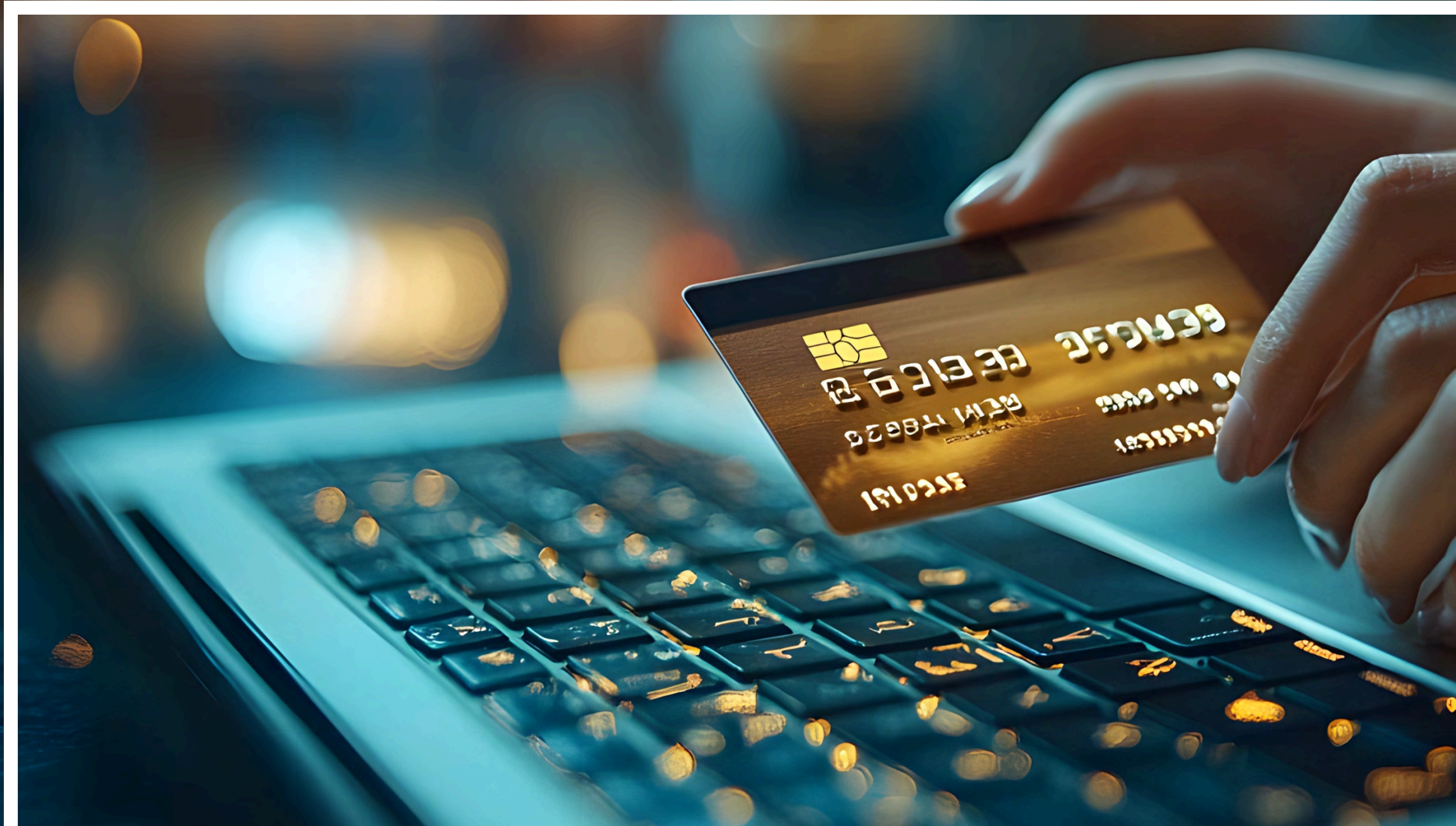


Sectors	Companies	Use Cases	Problem Statement	Solution and Impact
Accounting and Finance		Leveraging Gen AI to simplify tax filing and answer any questions related to tax.	Individuals struggle with filing their taxes accurately and efficiently due to the complexities of the tax code, the time-consuming nature of data entry, and the lack of personalized guidance. This can lead to missed opportunities for deductions and credits, potential errors on their returns, and increased stress and anxiety during the tax filing season.	By integrating AI and GenAI into TurboTax, Intuit aims to transform the tax filing experience, making it more accessible, efficient, and user-friendly. With Intuit Assist for TurboTax, it help users navigate their tax filings by providing real-time guidance and answering queries, thereby reducing confusion and enhancing the filing experience. It has automated automate data entry processes, making it easier for users to input information and reducing the time spent on filing.
Insurance		Leveraging Gen AI to empower consumers with swift and seamless resolution of their insurance policy-related queries.	Insurance policies and their terms can be challenging for customers to understand and navigate. Customers often have to scour through lengthy policy documents to find answers to their questions. Traditional customer support methods can be slow in providing timely and accurate information to customers.	The company is now Using Gen AI to provide quick, personalized answers to customer queries about their insurance policies such as medical coverage inquires, disease and treatment inquires, policy inclusion /exclusion, claim process, etc. This will enhance customer experience by brining in more transparency by empowering customers with easy access to information about their policies. Further it will also reduce customer support workload, allowing agents to focus on more complex inquiries and improving overall service quality.

GenAI Case Studies



Sectors	Companies	Use Cases	Problem Statement	Solution and Impact
Payments		Leveraging Gen AI to improve the checkout	Many consumers experience frustration during the online checkout process due to issues such as clunky payment gateways, confusing navigation, etc. These obstacles can lead to abandoned carts and lost sales opportunities for merchants. Additionally, as competition in the e-commerce space intensifies, businesses need to find innovative ways to streamline the checkout experience to retain customers and drive revenue.	By utilizing AI, PayPal aims to analyze customer behavior and shopping history to provide personalized recommendations and offers during the checkout process. This can help merchants target potential customers more effectively and improve conversion rates. Further they have developed "one-click" checkout feature called Fastlane, which simplifies the payment process and speeds up transactions and also AI-based tool called "smart receipts" will recommend personalized items to shoppers in their email receipts, along with cashback rewards. This way PayPal aims to transform the online shopping experience, making it more efficient, personalized, and user-friendly.
Wealth		Leveraging Gen AI to enhance personalized financial planning and improve client engagement through several innovative applications.	Clients face challenges in understanding complex financial information and making informed investment decisions. Thus, in order to provide personalized financial advice at scale becomes a significant challenge for investment firms as financial advisors often struggle with managing their time effectively, often getting bogged down in routine tasks.	Vanguard has built a digital advisor platform that provides tailored financial advice to clients based on their individual financial situations, goals, and preferences. Further they have also built Gen AI-powered Chatbots and Virtual Assistants which can understand and respond to client queries in real-time, offering personalized investment advice and assistance. They also automate routine tasks, allowing advisors to focus on building deeper relationships with clients.



Payments

Interview with Pine Labs



Amrish Rau

Chief Executive Officer

Let's start with a discussion on cross-border payments. Given their critical role in the global economy, do you believe there is a substantial market in India for fintech companies focused solely on cross-border transactions? This is particularly from a B2B perspective. How do you see fintechs addressing the challenges of regulatory compliance in this space? Do you foresee major players like Tata and Reliance switching from banks to fintech companies for these transactions?

Absolutely, the answer is yes. Cross-border payments are set to rise significantly and will increasingly be solved by fintechs in India. However, the landscape involves various forms of cross-border payments. The easiest one for fintechs to solve is a foreign buyer wanting to buy products from an Indian seller, with the money being received on or off the card rails. This is not a complex problem for Indian fintechs to address.

The more challenging aspect involves money moving out, such as for imports or non-card transactions, especially in a market like India where the currency is in a controlled environment. Solving for regulatory situations like OPGSP and PA-CB licenses will be crucial. Moreover, banks and financial institutions still have an advantage due to the extensive regulatory filings required for importing or exporting. For a fintech to succeed, they must approach this problem holistically, beyond just facilitating money movement. For instance, Stripe's acquisition of Lemon Squeezy, a company in the Merchant of Record (MOR) space, highlights the importance of having a broader wedge when enabling cross-border money movement.

Moving on to the payments landscape, where do you see the next phase of growth coming from? Are there any innovations or trends that you anticipate will drive this growth?

The greatest innovation in payments, particularly in India, will be UPI (Unified Payments Interface) becoming a full-stack solution. We're currently releasing a product that revolves entirely around UPI, sidelining traditional methods like cards or net banking. UPI is solving various transactions beyond just P2P (peer-to-peer) and P2M (peer-to-merchant); it's also addressing B2B (business-to-business) payments. For example, UPI's integration in IPO applications is a non-traditional use case that showcases its potential. UPI is essentially solving a trust issue in financial transactions by ensuring that once a lien is placed, the money is secured and won't go out. This implementation in the broader ecosystem will be revolutionary, and I believe we've only scratched the surface of its capabilities. Additionally, auto-pay functionalities around UPI will lead to the creation of new business models.

Interview with Pine Labs



The subsidies provided by the government for UPI are reportedly decreasing. How does that impact the ecosystem, and what are your thoughts on it?

While it's frustrating that subsidies for UPI are decreasing, it's important to remember that the larger ecosystem is more important than the individual components. As a payments company, it's our job to figure out how to make money in this environment. The focus should be on moving money faster, which in turn opens up new applications. If you ask me whether I prefer larger monetization per transaction with slower money movement or faster money movement with bigger volumes, I would choose the latter. The key is to monetize the opportunities that arise from faster money movement.

With the rise in digital payments, there's also been a significant increase in payment fraud. What measures has Pine Labs taken to enhance security and protect customers from fraud? How do you plan to stay ahead of evolving fraud techniques?

I'm not a big supporter of the idea that fraud is a major opportunity in India. With the widespread use of OTPs and second-factor validation, fraud as a percentage of transaction volumes is relatively low. I don't see fraud solutions becoming a major focus area. The current systems in place, such as validation of standing instructions and second-factor authentication, are already effective in keeping fraud at minimal levels.

There's a lot of competition in the payments industry. Do you see further consolidation happening in this space? How is Pine Labs positioned to stay ahead in both the online and offline spaces?

A common mistake founders make is thinking they can start with a niche in payments and gradually expand. The real approach in payments is to start broad and then scale. Businesses will not achieve significant scale unless they broaden their services across the entire payments value chain. For instance, starting with an online payments fraud engine is good, but if you don't expand to cover international cross-border payments or other services, you'll remain in a small niche and won't succeed at scale. This broadening of services could lead to mergers and acquisitions, especially for businesses strong in a specific area but lacking in others.

There's been much discussion around the public listing of payments companies, including Pine Labs. What's your plan, and what factors influence your decision regarding an IPO? How do you see the listing of payment companies unfolding in India?

Without specifically referring to Pine Labs, I believe companies that have reached a certain scale in India should consider IPOs in the Indian market. Listing allows for diversifying shareholding and creating new opportunities. For example, a company with a market cap of ₹30,000-40,000 crores (\$3.6-4.8 billion) is significant in the Indian market, and it makes sense for such a company to go public. The Indian market can accommodate companies going public at valuations of 2000 crores or even slightly lower, as seen with companies like Zagg. It's an obvious step for companies that have achieved considerable size and scale.

Interview with Pine Labs



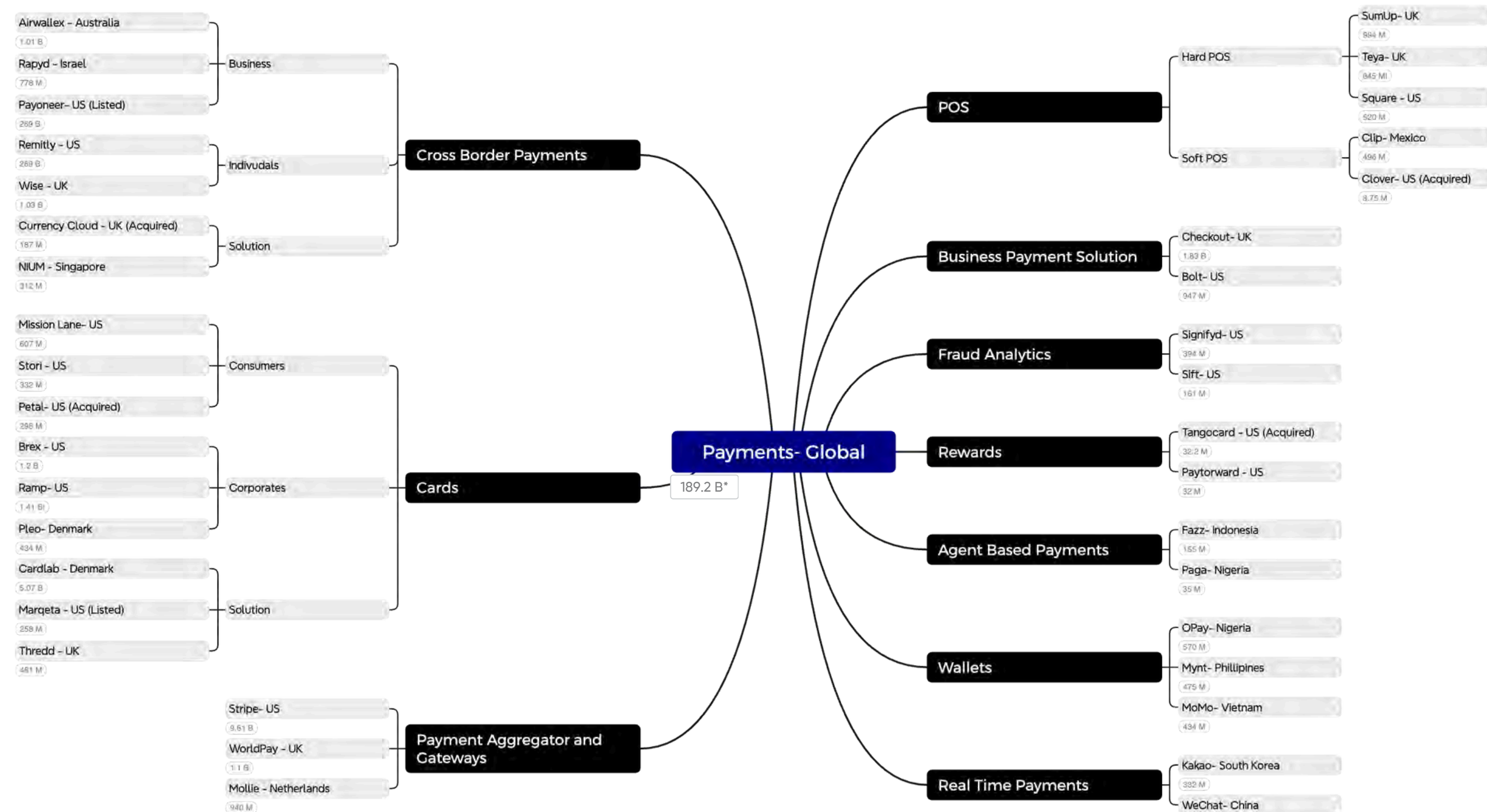
Earlier, you mentioned credit as a significant trend in fintech. Could you elaborate on your thoughts regarding credit?

The latent demand for credit in India is enormous, spanning supply chain financing, consumer durable financing, and trade financing. Classic consumer credit is also set to expand rapidly. For instance, there are currently about 80 million credit card users in India, and I believe that number could grow to 200 million faster than expected. This growth will be driven by several factors: the introduction of UPI Plus credit, stronger credit bureaus, account aggregator data improving underwriting, and the evolving distribution points for credit. It's an exciting area with significant potential.

Lastly, you mentioned UPI becoming a full-stack solution as a significant trend in India. Are there any similar trends or evolutions happening in the payments space outside of India?

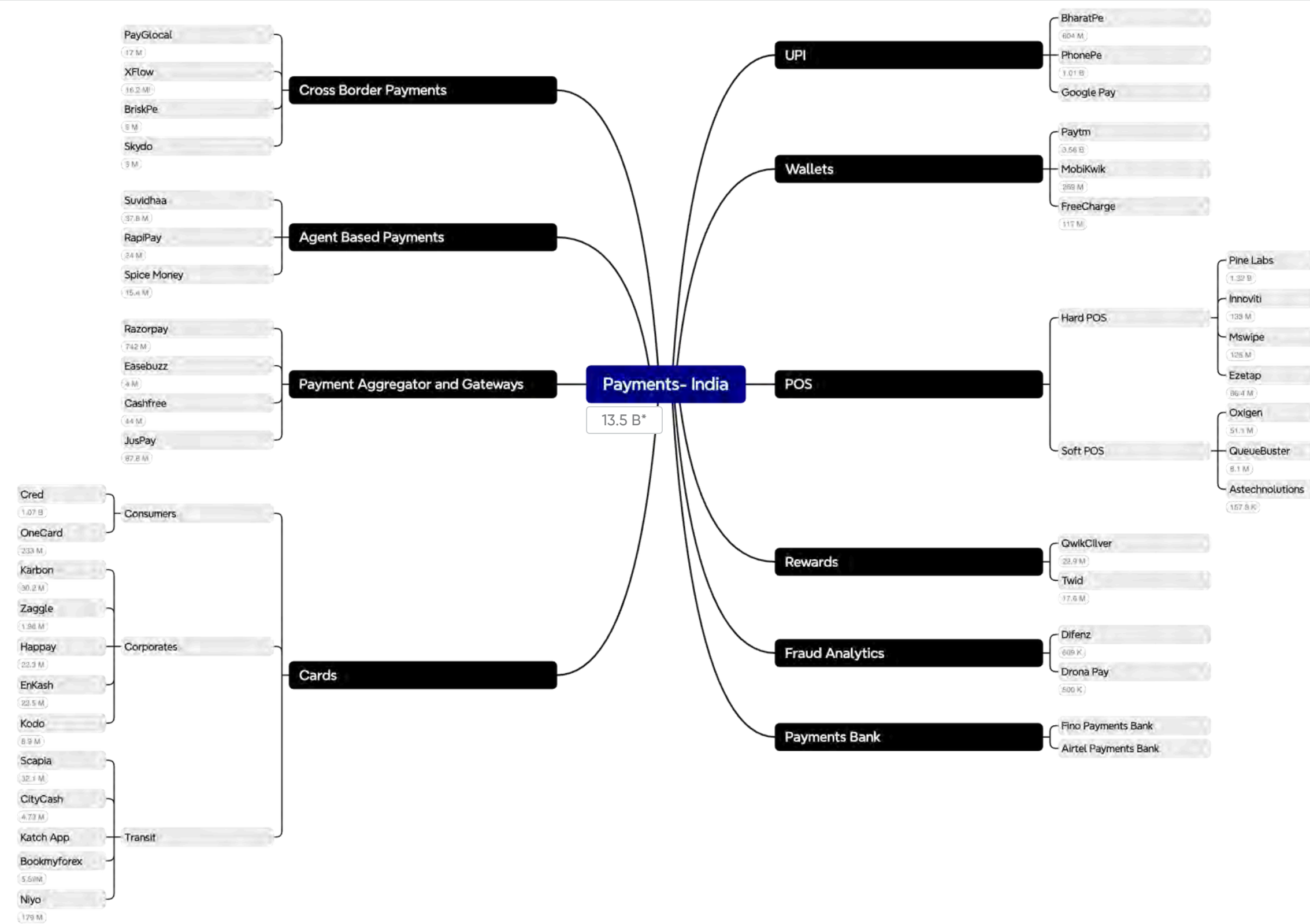
The closest parallels are seen with PIX in Brazil and the developments in China with Alipay and WeChat Pay. These platforms have already achieved what UPI is aiming for, and at scale. While we often discuss the innovations happening in India, it's important to recognize that Alipay and WeChat Pay have set the benchmark globally.

Global Mindmap



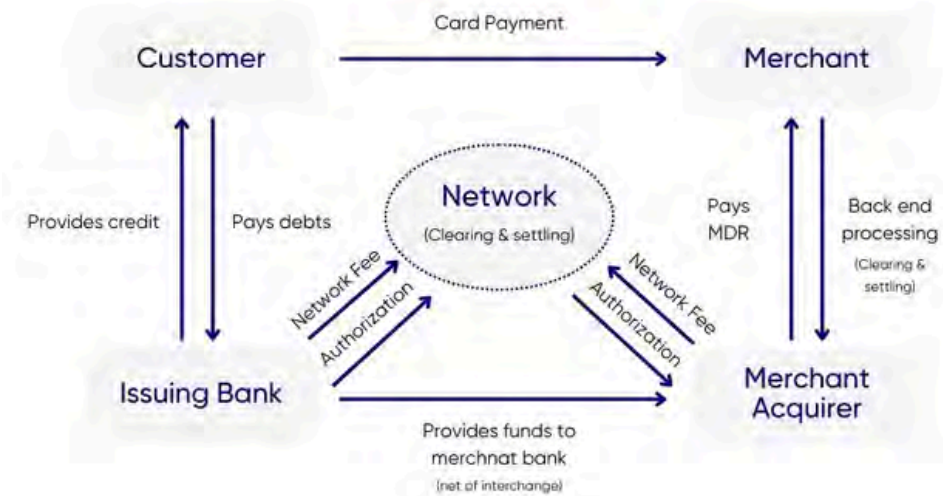
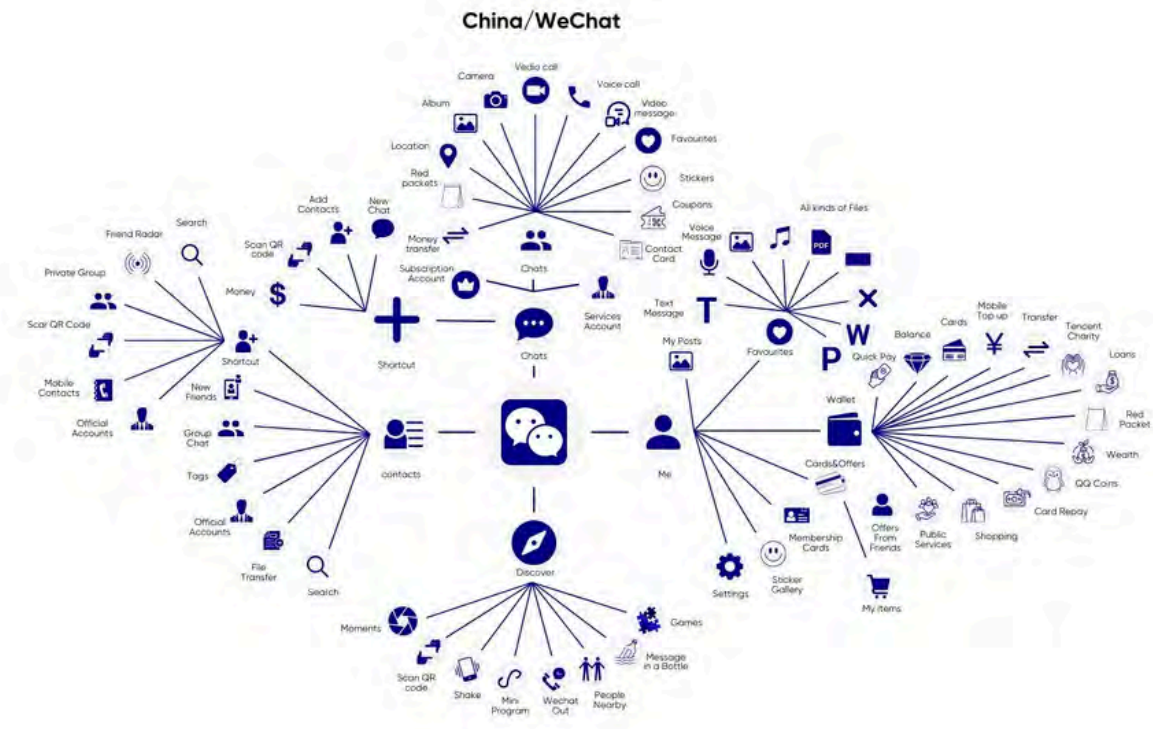
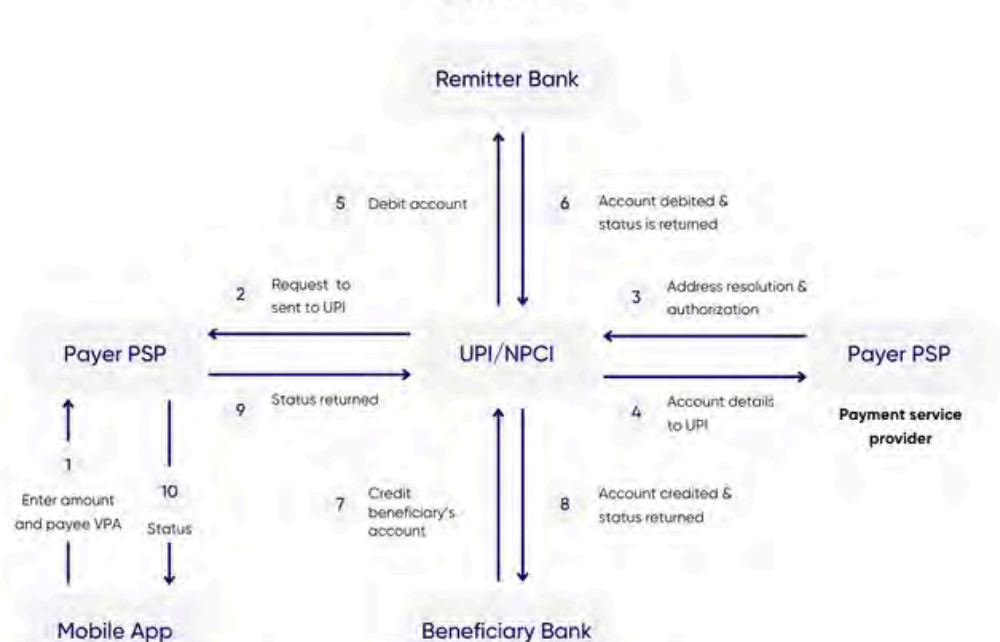
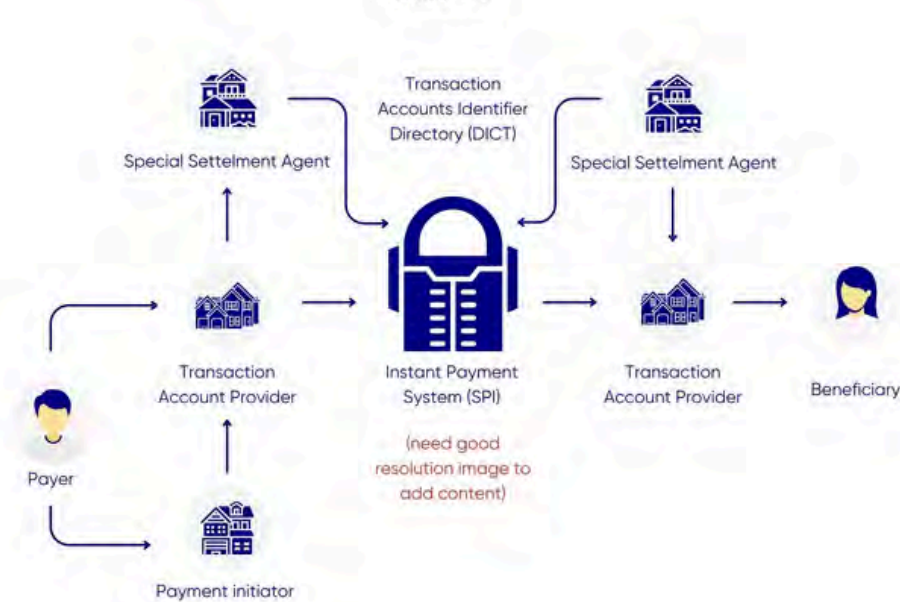
* Funding Period from 2015 - 2024
Source: Tracxn, Varanium Research

India Mindmap



* Funding Period from 2015 - 2024
Source: Tracxn, Varanium Research

VARANIUM



Global Benchmarking of Fees/MDR on Digital payments

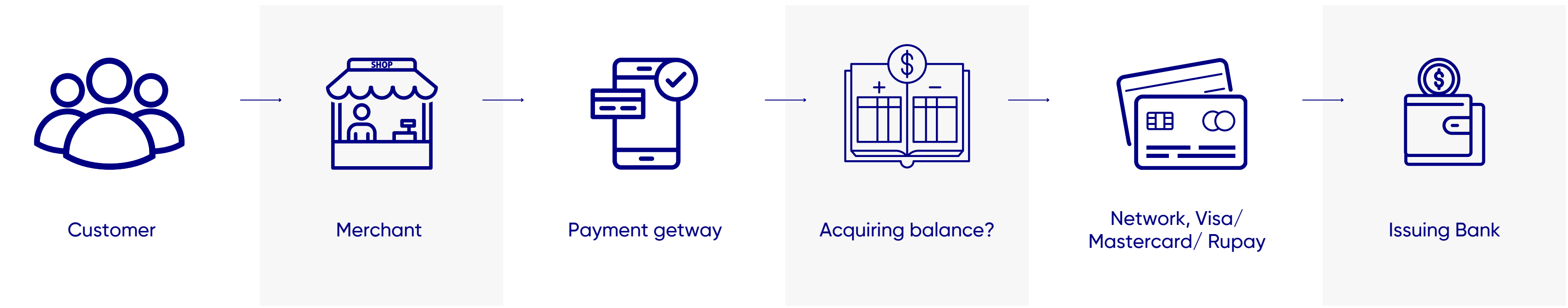
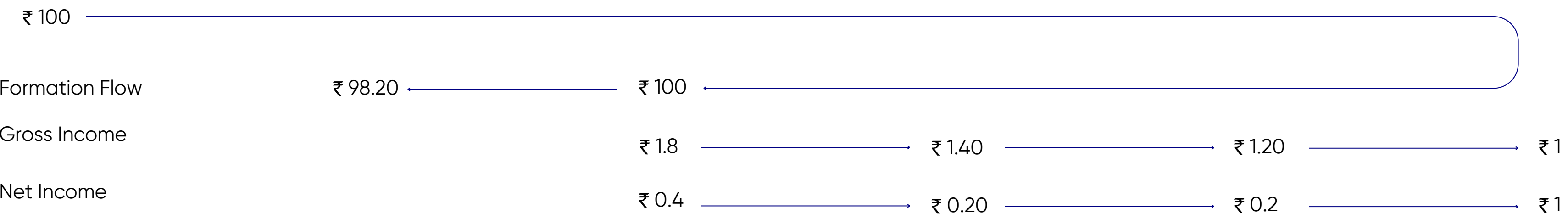


Payment Instrument				
Credit Cards	1.4% – 1.8%	1.5% – 3.5%	1.5% – 2.5%	0.4% – 0.5% 1.5%~ intl
Debit Cards	Below INR 2K: 0.3% – 0.5% Above INR 2K: 0.8% – 1.1%	0.2% – 0.5%	0.2% – 0.5%	0.3% – 0.4% 0.8 – 1.2%~ intl
Real-Time Payments (C2B)	UPI- 0.1%- 0.2% Credit/PPI on UPI – 1% -1.2%	0% – 0.5% (ACH, RTP)	0% – 0.3%	0.55% – 0.7% (WeChat Pay, Alipay)
E-NACH / ACH	INR 5 per registration, INR 5 per pull	USD 0.25 – USD 1 per pull	SGD 0.05 – 0.20 per pull	CNY 0.1 – 0.5
Offline Payments	Rental – INR 100-700 per month MDR similar to other payment modes	USD 0.10 – 0.50	SGD 0.10 – 0.30	0.1% – 0.8% (Domestic CUP, local cards)
Net Banking	INR 20 – 30	USD 0.10 – 0.50	SGD 0.20 – 1.00	CNY 0.1 – 0.5
Cross-Border Payments	1.8% – 5%	1.5% – 3.5%	1% – 2.5%	0.5% – 2.5%

Value Chain Analysis



Payment Value Chains
Credit cards. Typical Settlement is T+1

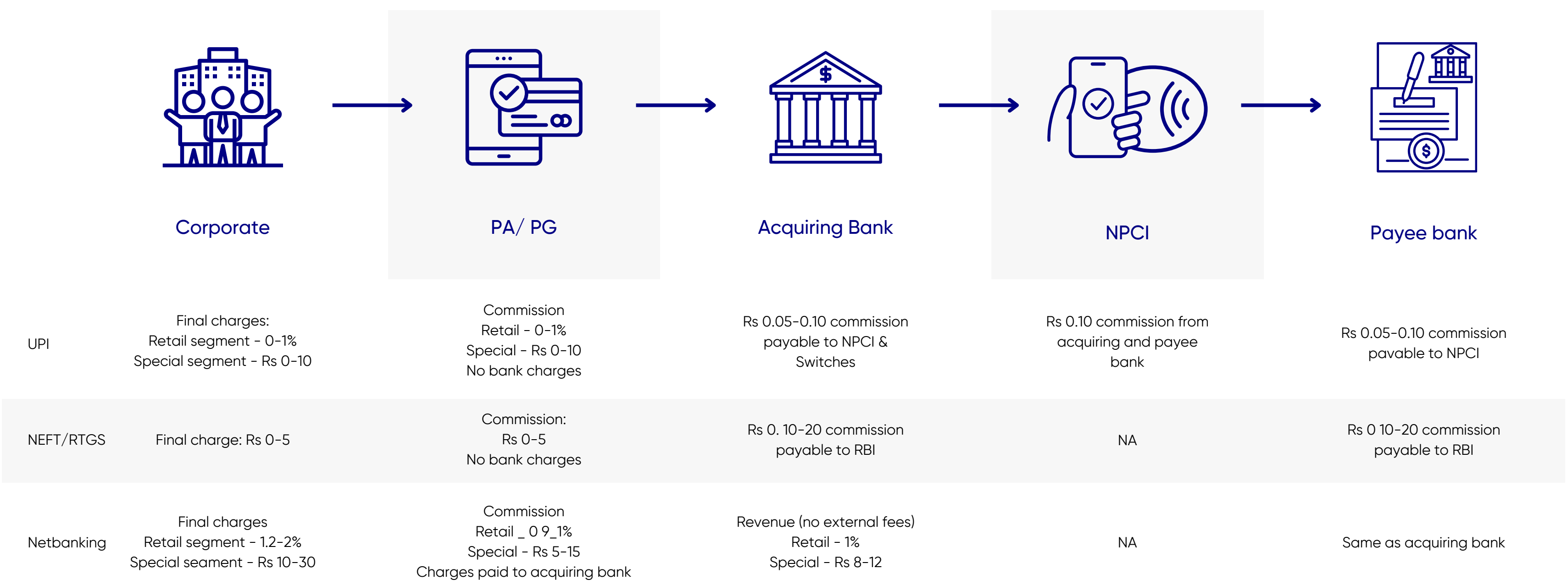


Note: The flow is on approximate and may vary on a case by case basis
Source: Varanium Research

Value Chain Analysis

UPI/NEFT/RTGS/Net Banking

Credit cards. Typical Settlement is either real time or T + 1

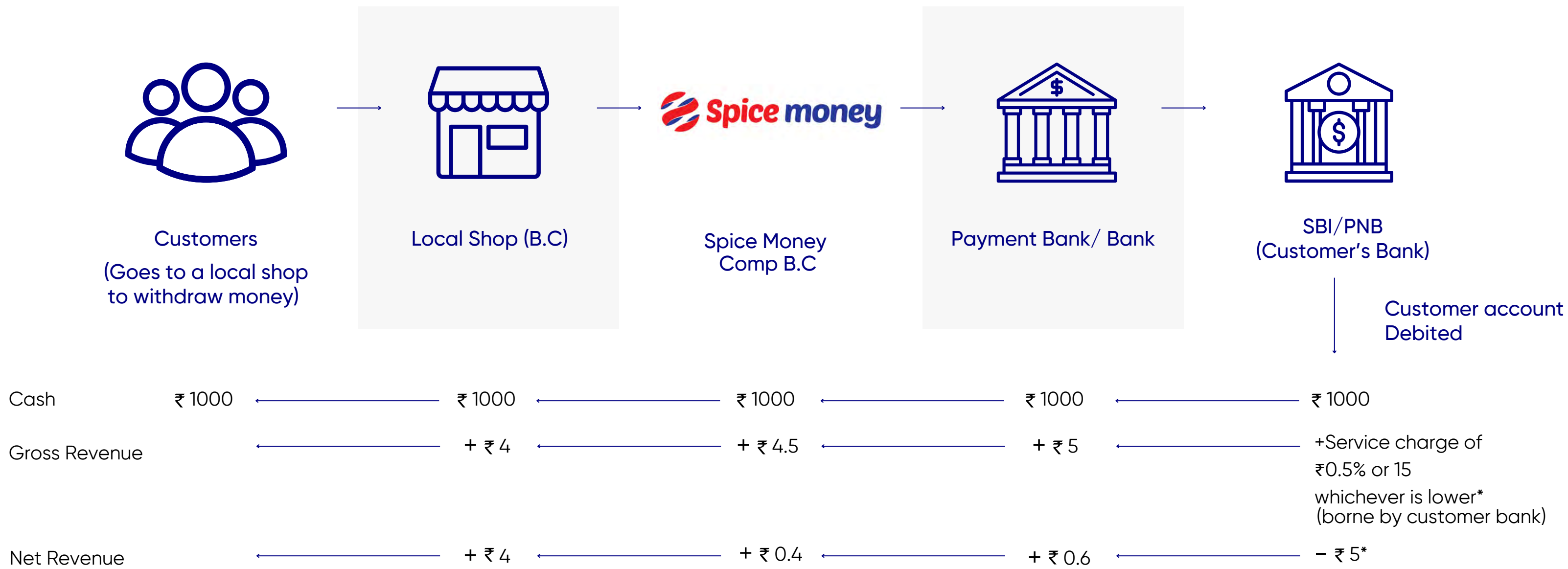


Note: The flow is on approximate and may vary on a case by case basis

Source: Varanium Research

Value Chain Analysis

AEPS- Cash withdrawal through fingerprint



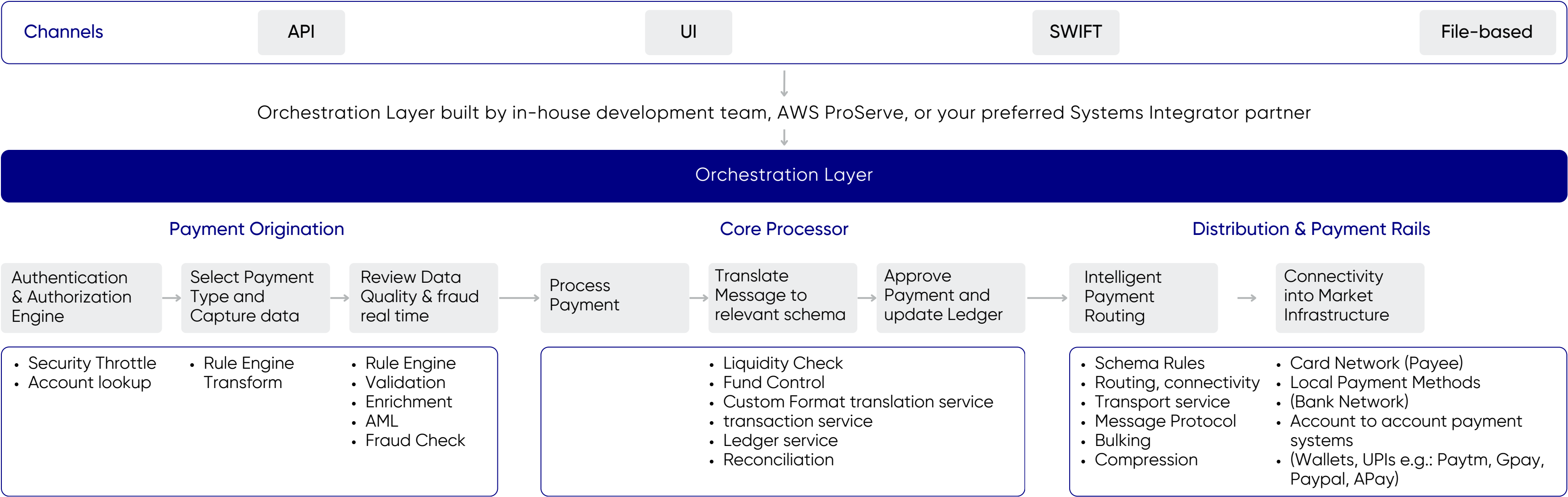
Note: The flow is on approximate and may vary on a case by case basis
Source: Varanium Research

Functional Flow



Payments System Modular Functional Flow

Break down services into components to reduce risk and increase flexibility



In the rapidly evolving landscape of India's FinTech payment industry, technology is no longer just an enabler—it's the driving force behind a financial revolution. As digital transactions surge and innovative payment methods emerge, the power of cloud computing is reshaping the sector's foundations. This section delves into how cutting-edge technology is not only addressing critical challenges in fraud detection and security, but also unlocking unprecedented scalability, resilience, and agility for payment service providers. From accelerating time-to-market to orchestrating complex payment workflows, we explore how the fusion of fintech, cloud computing, analytics, artificial intelligence and generative AI is propelling India's payment industry into a future of limitless possibilities, enhanced customer experiences, and robust financial ecosystems.

Functional Flow



The image titled "Payments System Modular Functional Flow" illustrates a streamlined approach to managing payment services by breaking them into smaller modules. This method aims to reduce risk and enhance flexibility in payment processing. At the top of the diagram, it shows various channels, which represents, different ways payments can be initiated. Most common approaches are APIs (Application Programming Interfaces - e.g. - Razorpay), user interfaces (UI - e.g. Amazon Pay, PhonePe etc) based, SWIFT (a global provider of secure financial messaging services), and file-based methods. These channels serve as entry points for payment transactions.

Below the channels is the [Orchestration Layer](#), which acts as a central hub for coordinating different components of the payment system. This is a complex integration layer, developed by various FinTech providers, and the system is tailored to specific business needs. The payment is further processed via three main logical components.

Payment Origination:

This module involves the initial steps of processing a payment. It starts with the [Authentication & Authorization Engine](#), which ensures that the transaction is secure and legitimate. . This component uses industry standard protocols like OAuth 2.0 or SAML for identity verification and employs role-based access control (RBAC) for authorization. This also involves enhanced security measures like throttling (limit the rate of requests or actions in a system to prevent overload and ensure fair resource usage) and account lookup.

Next, the system selects the payment type and captures necessary data, using rules and transformations to ensure accuracy. This component uses dynamic forms or schema validation to ensure all required fields are collected based on the payment type (e.g., NEFT, IMPS, RTGS, UPI). The data is then reviewed for quality and checked for fraud in real time, employing validation, enrichment, anti-money laundering (AML) checks, and fraud detection mechanisms. This component employs generative AI and machine learning algorithms for anomaly detection and integrates with external databases (fraud, AML) for real-time risk scoring. It may use techniques like velocity checks, IP geolocation, and pattern matching to identify potential fraudulent activities.

Core Processor:

The Core Processor module is the engine room of the payment system. The Process Payment component handles the main transaction logic, including account balance checks, fee calculations, and currency conversions. It ensures ACID (Atomicity, Consistency, Isolation, Durability) properties for each transaction. The Translate Message to Relevant Schema component uses data mapping tools or libraries to transform payment data between different formats (e.g., ISO 20022, SWIFT MT, proprietary schemas). The Approve Payment and Update Ledger component uses double-entry bookkeeping principles to record transactions for audit trails.

Functional Flow



Distribution & Payment Rails:

This module manages the final stages of payment execution. The Intelligent Payment Routing component uses algorithms to determine the optimal route for each payment based on factors like cost, speed, and destination. It may employ machine learning for continuous optimization. The Connectivity into Market Infrastructure component implements adapters for various payment networks (e.g., SWIFT, UPI, Bank Networks - RTGS, NEFT), handling protocol-specific requirements, encryption, and digital signatures. This module also manages batching and unbatching of transactions for efficient processing, implements compression algorithms to optimize data transmission, and ensures compliance with network-specific messaging standards and settlement rules.

Each of these modules is designed to be loosely coupled, allowing for independent scaling, maintenance, and upgrades. They communicate through well-defined interfaces, often using message queues or APIs, to ensure resilience and flexibility in the overall system architecture.



Easebuzz, an RBI licensed FinTech platform based in Pune, India, is at the forefront of digital payments and financial automation. Serving over 1,80,000 customers across diverse industries, Easebuzz processes more than a million transactions daily through over 100 payment modes. With its flexible API plugins, the platform delivers secure, scalable, and cost-effective transaction solutions. By automating complex financial workflows for large organizations such as Indian Railways and various Indian universities, Easebuzz is integral to streamlining payment processes and optimizing operations across multiple sectors.

GTV
₹2,40,000 crores; USD 28 Bn

Problem Statement

As Easebuzz rapidly scaled, managing the exponential growth in transaction volume and data complexity became a critical challenge. Beyond transactional data, the solutions built on top of the payment system generated massive amounts of additional data, requiring the processing of 700-800 million logs daily, amounting to terabytes of information. This demanded a robust infrastructure capable of handling both structured and unstructured data at an immense scale. Easebuzz needed not only a solution to support this growth but also advanced analytics to transform raw data into actionable insights, enabling faster and more informed decision-making. To maintain its competitive edge, Easebuzz adopted a data-driven approach to better serve its expanding merchant base and drive the entire ecosystem forward. Additionally, it prioritized stringent data security, compliance, and established data governance to ensure the highest levels of protection and regulatory adherence.

Technical Solution

To address these challenges, Easebuzz adopted a scalable, data-driven architecture on AWS, designed to meet the needs of a rapidly expanding fintech ecosystem. The company migrated to a serverless data lake architecture using Amazon S3 to efficiently store and manage historical and real-time log data using Pyspark and Amazon Glue capabilities. With Amazon Athena's serverless interactive query capabilities and Amazon QuickSight for deep business intelligence insights, Easebuzz empowered its teams to extract meaningful insights from massive datasets in real-time. Additionally, the platform implemented Amazon Neptune for real-time fraud detection, helping identify and mitigate fraudulent activities with greater speed and accuracy. To ensure stringent security and compliance, Easebuzz worked closely with AWS security experts, integrating AWS Config for continuous compliance monitoring. This comprehensive setup allowed Easebuzz to not only scale but also to transform into a fully data-driven organization that could harness the power of analytics to optimize product development, enhance customer experience, and drive innovation.

Impact

By embracing a flexible and scalable data lake architecture, Easebuzz achieved transformative results:

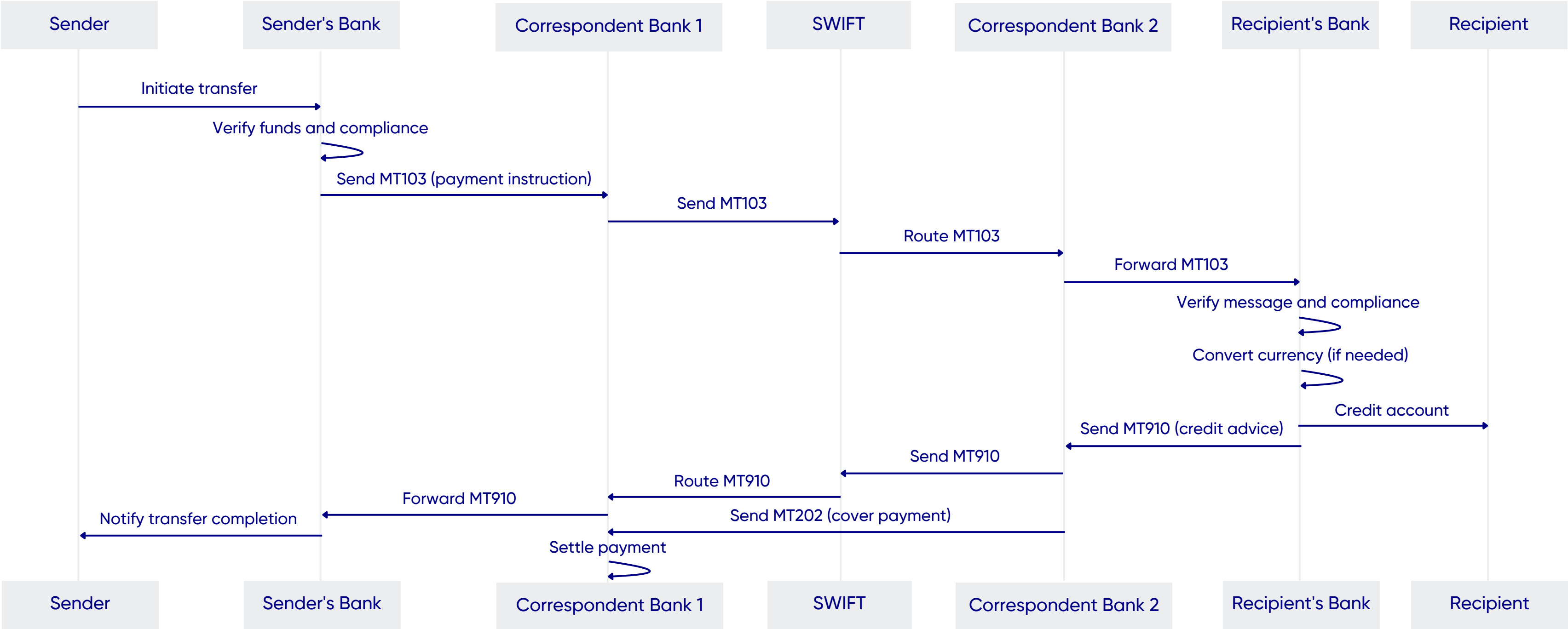
60%	89%	40%	New revenue	Enhanced
reduction in data storage costs through efficient management of massive datasets.	faster report generation, enabling rapid decision -making and real-time insights.	improvement in fraud detection, significantly enhancing transaction security and reducing revenue leakage.	streams identified, leveraging deep data analytics to drive growth and innovation.	operational performance and product development, driven by data insights that enabled proactive monitoring and swift mitigation of issues, reducing operational inefficiencies

This shift to a data-centric approach enabled Easebuzz to not only scale its operations but also to lead its ecosystem toward a future where data-driven insights are at the core of every strategic decision, driving both the organization and the industry toward greater success.

Cross Border Payments – Traditional Rails



SWIFT – Inward Remittances

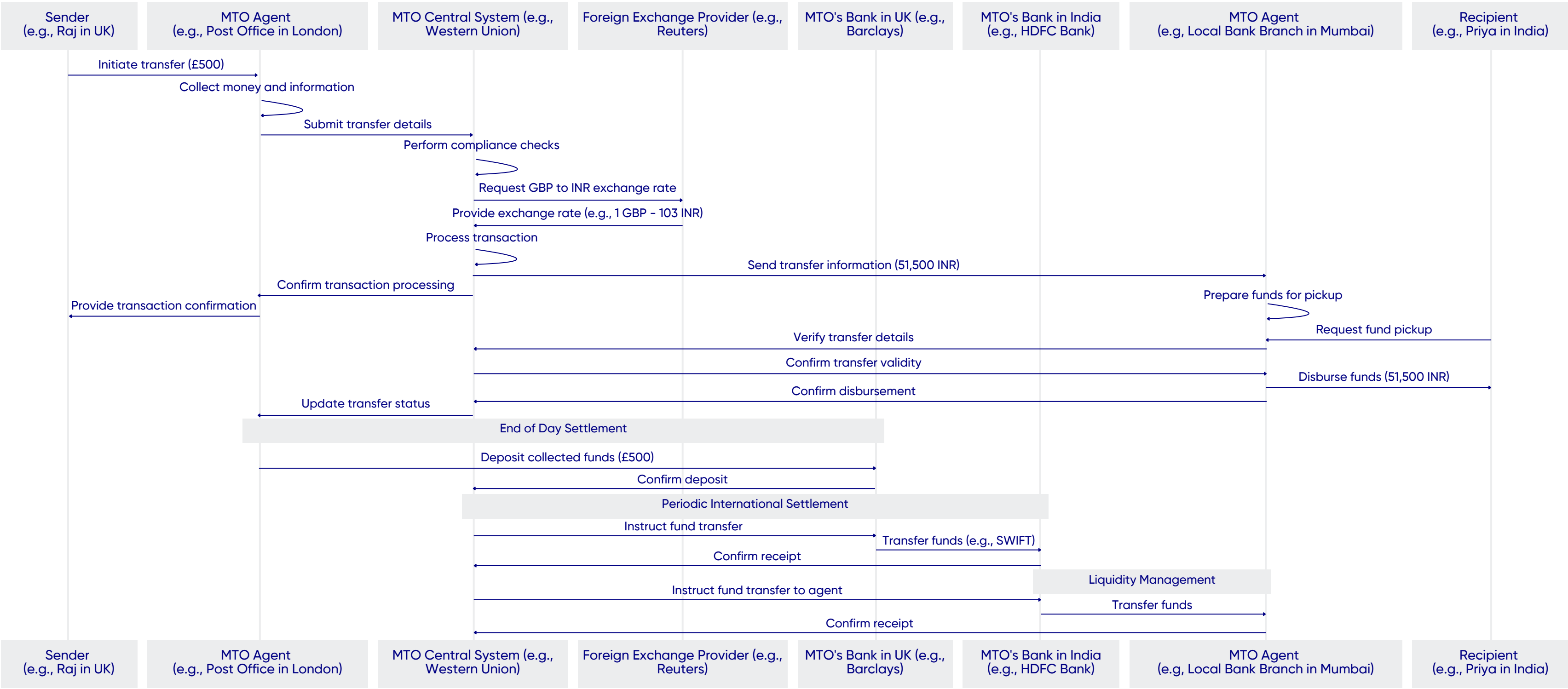


Source: Industry Experts, Varanium Research

Cross Border Payments – Traditional Rails



Money Transfer Operator – Inward Remittances

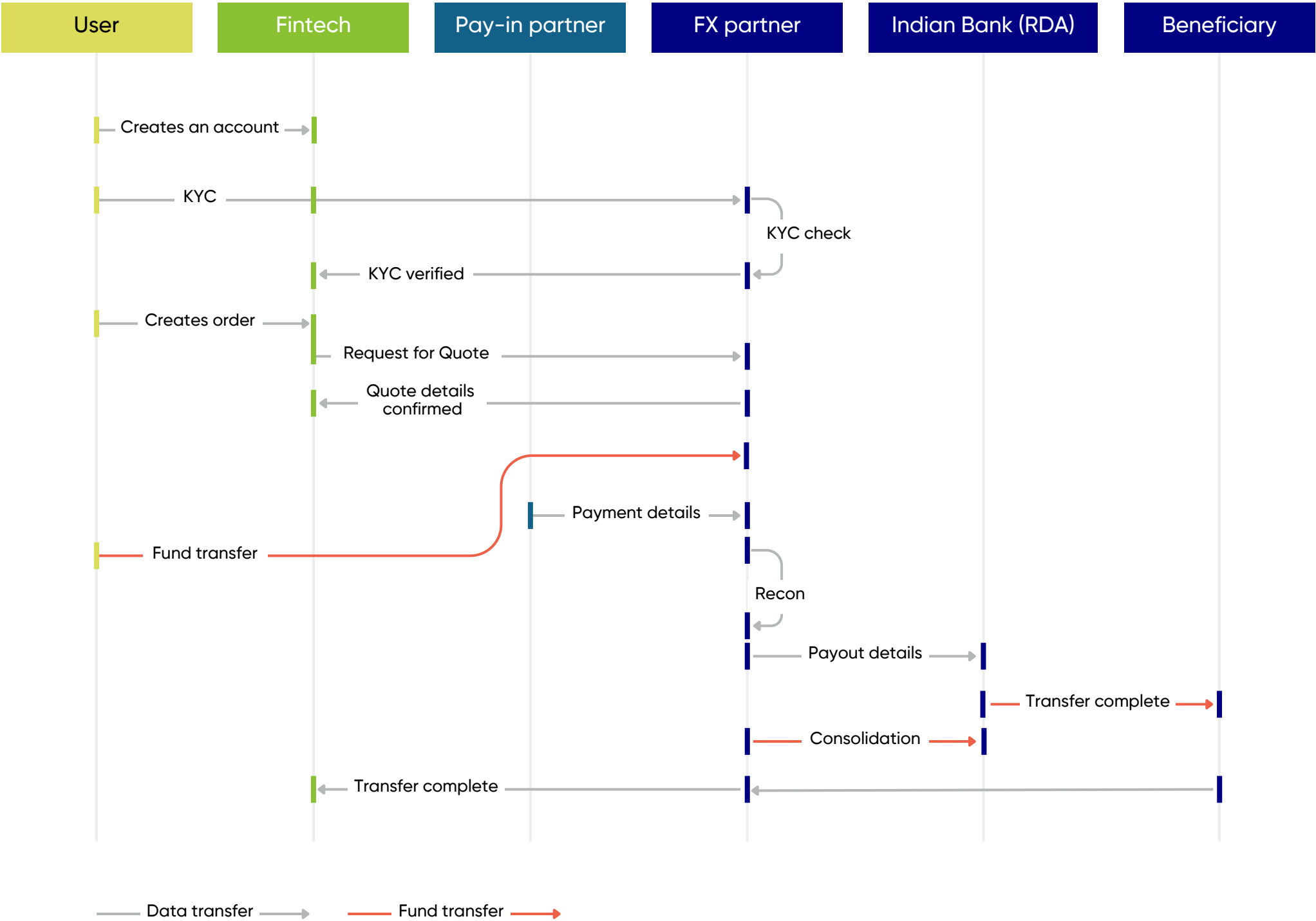


Source: Industry Experts, Varanium Research

Cross Border Payments – New Age Rails



Closed Loop: P2P Inward Remittance (Real-time Settlement)



There is no fundamental difference between new-age payment rails and traditional payment rails, as both rely on SWIFT for transaction processing. The distinction lies in how the transaction flow is managed and handled along with pre-funding/ working capital being used.

The diagram above illustrates the inward remittance payment rails in India, specifically for Person-to-Person (P2P) transfers.

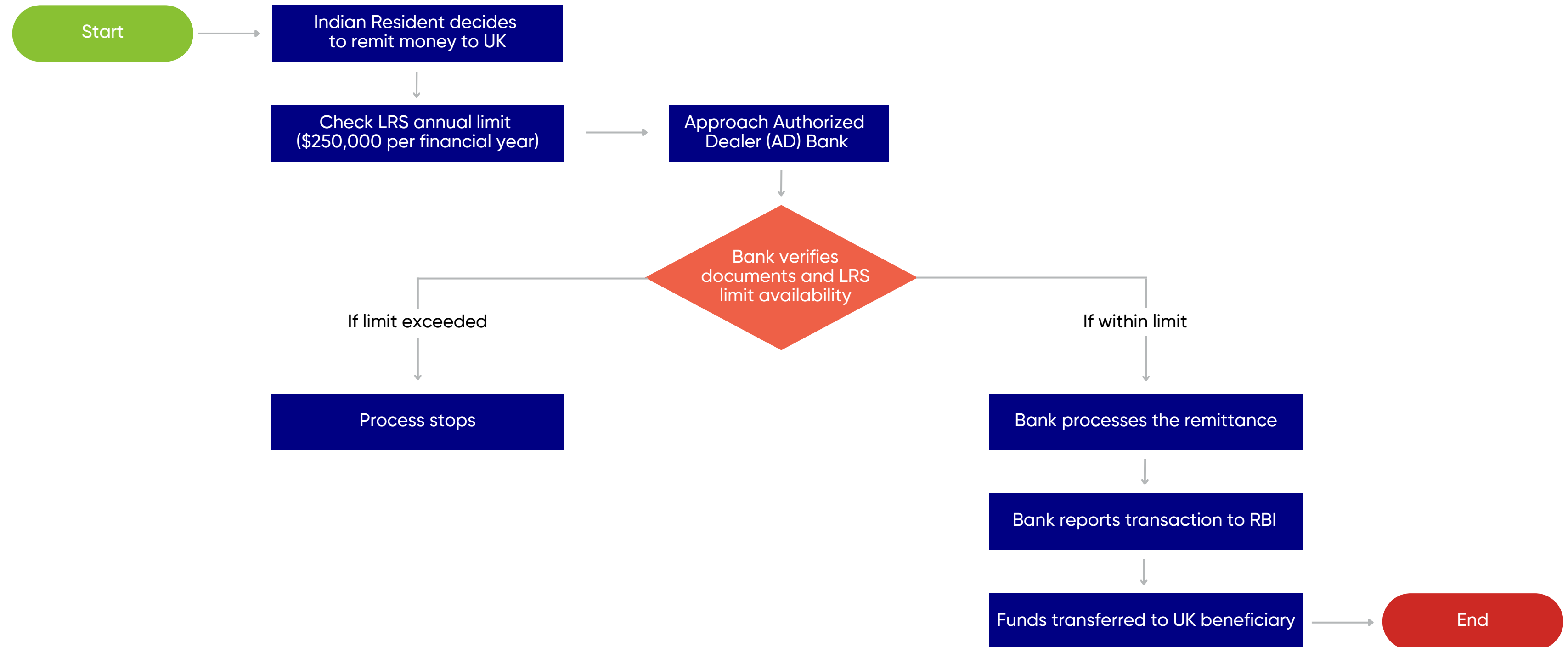
The company sets up a bank account with a foreign bank to facilitate and safeguard user funds/ transactions. All funds from users intending to transfer money are credited to this account by payment processors accepting cards/ account to account transfers on local payment schemes. At the end of the day or at specific intervals, funds are moved programmatically from the foreign bank in bulk to Indian Bank's Vostro Account with a Foreign Bank. As soon as the funds are sighted/ credited in the Vostro account - Rupee Drawing Account maintained with the Indian Bank is credited with a corresponding INR amount (FX conversion).

Prefunding the RDA account ensures real-time transfers to the recipient as soon as the remitter initiates the transaction. To achieve this, the company uses its own balance sheet to immediately transfer funds to the recipient, resulting in a temporary mismatch of funds for a few hours or up to a day. To manage this, the company maintains a reserve of parked funds in its Indian bank account, ensuring smooth operations until the domestic bank settles the amount received from the foreign bank.

By batching transactions instead of processing them individually, the company reduces transaction fees. These cost savings are passed on to customers, while recipients benefit from real-time fund transfers.

Cross Border Payments – New Age Rails

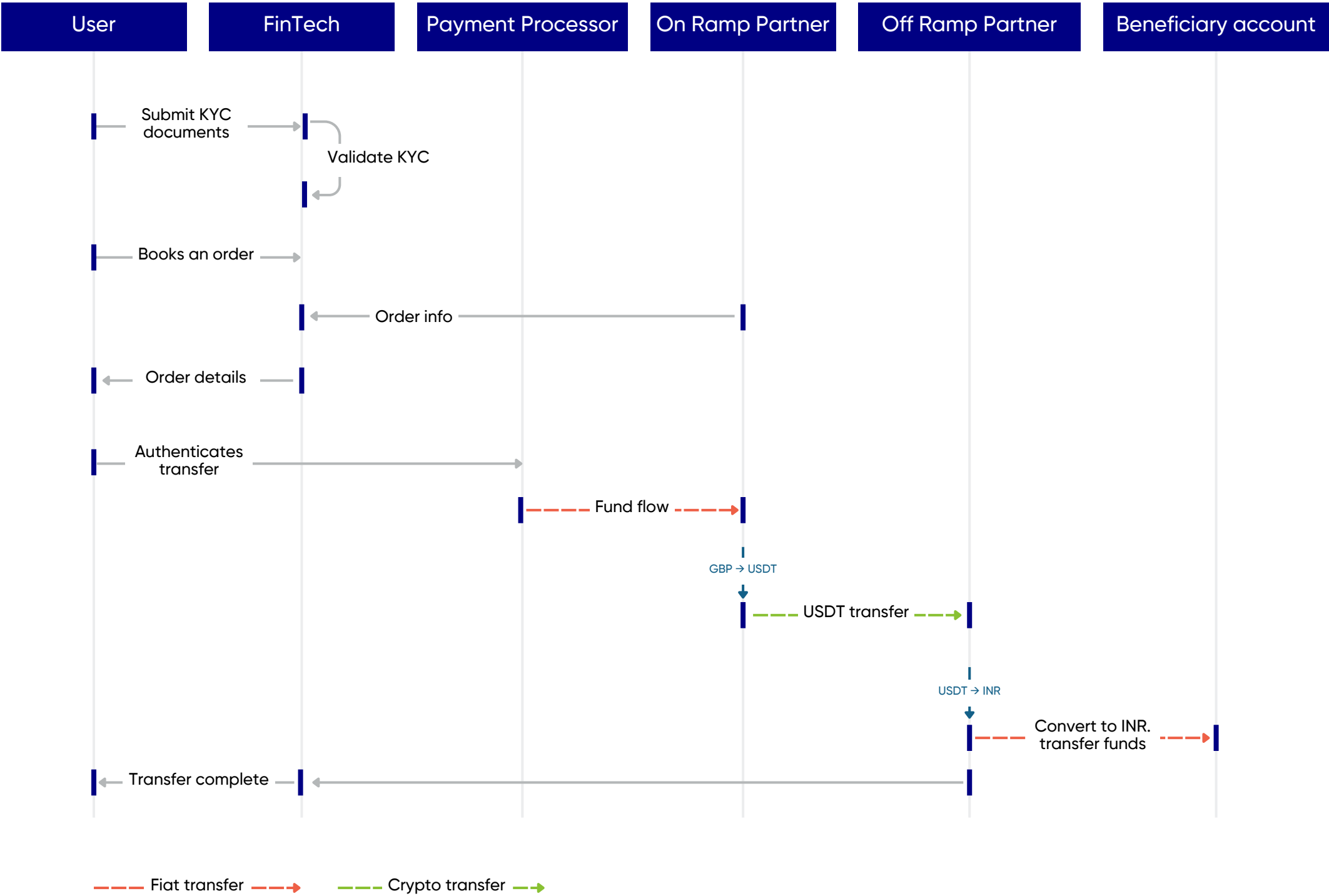
Outward LRS: P2P Transfer



Cross Border Payments: New Age Rails



Distributed Ledger Technology: P2P Transfer



Source: Industry Experts, Varanium Research

Comparison: Traditional vs New Age



Modes	Speed	Cost	Transparency
Swift + MTO	2010: Several Days	2010: 9.67%	2010: Lack of transparency, hidden fees & unclear exchange rates
	Present: Near Instant	2023: 6.3%	Present: Increased regulatory pressure, competition have forced MTOs to be more transparent with clear fee structures and upfront exchange rates
Closed Loop	2015: Same day	2015: 2-3%	2015: Fintech companies introduced transparent pricing models, displaying fees and exchange rates upfront
	Present: Near Instant	2023: 0.5-1.5%	Present: Transparency- a key selling point with real-time tracking and clear pricing being standard features
Virtual Digital Assets	2017: 10 mins- 1 hour	2017: 2-10%	2017: Transparency depended on user understanding of blockchain transactions with fees visible on public ledgers
	Present: Near Instant	2023: 0.5-2%	2023: User-friendly interfaces and clearer fee structures have improved transparency, though understanding network fees can still be complex
Cross Country Closed Loop (Project Nexus)	Within 60 sec	NA	NA

Interview with NIUM



NIUM has a global presence. What are some of the unique challenges and opportunities you encounter in different regions? How does NIUM ensure compliance with the varying regulations in different countries?

As a global leader in cross-border payments, Nium encounters distinct challenges and opportunities across various regions. Each market presents its own regulatory landscape, cyber threat environment, and customer expectations, requiring a nuanced approach to maintaining excellence in service delivery.

Nium's cross-border payments solution exemplifies innovation by offering seamless and secure transactions for businesses and individuals worldwide. By enabling real-time transactions in 100 markets and supporting 100 currencies, we drastically reduce processing times from days to seconds, enhancing both efficiency and user experience. Our local collection capabilities in 35 markets further optimize costs and streamline operations.

However, with this global reach come significant challenges, such as data breaches, identity theft, and financial fraud, all of which are compounded by varying regulatory requirements and cyber threats across countries. To address these, Nium adheres to a rigorous compliance and legal framework during the onboarding process, aligning with the most respected regulators, such as the Monetary Authority of Singapore (MAS), to set a gold standard of protection across all regions.

With regulatory licenses and authorizations in over 40 countries, Nium ensures seamless onboarding, rapid integration, and compliance, regardless of geography. This comprehensive approach allows us to navigate the complexities of global operations while maintaining trust and security at the core of our services.

Can you talk about any key partnerships NIUM has formed and how they have benefited the company and its customers?

At Nium, our strategic partnerships are crucial to delivering exceptional value to our customers. We collaborate with some of the world's leading financial institutions and payment networks to ensure our services are secure, efficient, and globally competitive.

Interview with NIUM



- **Bank Partners:**
Partnering with some of the world's biggest banks like J.P. Morgan Payments allows us to offer our customers enhanced security and access to some of the best foreign exchange (FX) rates in the market.
- **Card Issuance:**
Through our partnerships with Visa and Mastercard, we provide world-class card issuance services. These partnerships enable us to offer a wide range of payment solutions, from virtual and physical cards to multi-currency wallets, catering to diverse customer needs and enhancing their payment experiences globally.
- **Key Payment Networks:**
By working with key payment networks like FAST in Singapore, we provide direct payment services that are fast, reliable, and secure.

These partnerships have been instrumental in expanding our service offerings, improving transaction speed and security, and ultimately enhancing the overall customer experience. By aligning with industry leaders, we continue to set the standard for innovation and excellence in cross-border payments.

What are the latest pay-in and pay-out methods been introduced for money remittances?

In 2024, Nium introduced three groundbreaking enhancements to its platform, designed to improve cross-border payment visibility and simplify client integration:

- **Confirmation of Payee:**
This feature enhances accuracy by validating bank details against registered account holder information before processing a transaction. By ensuring the correct recipient is identified, it reduces return rates and increases transaction reliability, offering peace of mind to both senders and recipients.
- **Swift GPI:**
Leveraging Swift GPI, this tool provides detailed, real-time transaction status updates. It offers end-to-end visibility, allowing customers to track payments from initiation to completion, significantly improving the overall customer experience.
- **Batch Payouts:**
This feature automates bulk payment processing, eliminating the need for manual coding. Businesses can manage large volumes of payouts effortlessly, with real-time monitoring and automatic data validation ensuring accuracy and efficiency.

Interview with NIUM



These innovations highlight our commitment to delivering advanced, user-friendly solutions that address the evolving needs of our clients and the broader financial ecosystem. By continually enhancing our platform, we strive to make cross-border payments more seamless, reliable, and transparent.

Whats your view on Project Nexus and how do you see NIUM perceive the potential impact of Project Nexus on the global payments landscape?

Project Nexus represents a groundbreaking initiative in the global payments landscape, aiming to connect domestic instant payment systems across borders, thereby enabling faster, more efficient, and cost-effective cross-border transactions. At Nium, we see this as a significant step toward achieving greater financial inclusion and interoperability on a global scale.

Nium perceives Project Nexus as a catalyst for transformation in the payments industry. By simplifying and standardizing cross-border payments, the project aligns closely with our mission to deliver seamless and secure transactions across the world. The potential impact of Project Nexus on the global payments ecosystem is profound—reducing friction, lowering costs, and enhancing the speed of transactions, which are all critical to the success of businesses and individuals operating in a global marketplace.

Moreover, Project Nexus' emphasis on collaboration among different countries' payment systems resonates with Nium's approach of fostering partnerships and innovation. As a leader in cross-border payments, Nium is well-positioned to leverage the advantages of Project Nexus, further improving our service offerings and expanding our reach. We believe that the widespread adoption of this initiative could lead to a more connected and efficient global economy, benefiting all stakeholders involved.

What advice would you give to individuals developing cross-border payment solutions, and what challenges should they anticipate?

For those developing cross-border payment solutions, our advice is to focus on three critical areas: regulatory compliance, technological innovation, and customer-centricity. The global payments landscape is complex, with each market presenting unique regulations, customer expectations, and technological infrastructure. Successfully navigating these differences is essential.

Interview with NIUM



- *Prioritize Regulatory Compliance:*

One of the biggest challenges in cross-border payments is ensuring compliance with diverse and often stringent regulations across multiple jurisdictions. We emphasize the importance of deeply understanding the legal frameworks in each market and building robust compliance processes that can adapt to evolving regulations. Partnering with local experts and securing the necessary licenses and authorizations are crucial steps in this journey.

- *Invest in Advanced Technology:*

The payments industry is rapidly evolving, and staying competitive requires developing scalable and secure technological solutions that can handle the complexities of cross-border transactions. This includes areas like currency conversion, fraud detection, and data security. We believe that real-time processing capabilities and seamless integration with various financial systems are essential for meeting user expectations and delivering a superior experience.

- *Focus on Customer-Centric Design:*

Understanding the needs and pain points of our customers is at the heart of what we do. Cross-border payments can be daunting for users due to the perceived risks and complexities involved. We prioritize user experience by ensuring transparency, ease of use, and reliability in our solutions. Simplifying processes like onboarding and transaction tracking, along with providing robust customer support, helps us build trust and confidence with our customers.

- *Anticipating Challenges:*

We anticipate challenges such as navigating regulatory discrepancies between regions, managing cross-border fraud risks, dealing with currency volatility, and addressing the high operational costs associated with global transactions. Additionally, building and maintaining a network of banking and payment partners across various markets is crucial but can be resource-intensive.

By focusing on these areas and proactively addressing challenges, we are confident that we can develop cross-border payment solutions that not only meet market demands but also stand out in a competitive industry.

Project Nexus



Meaning

Project Nexus is an initiative led by the Bank for International Settlements (BIS) to enable instant cross-border payments by interlinking domestic instant payment systems (IPS) globally. It aims to achieve the G20 target of enabling faster, cheaper, more transparent, and more accessible cross-border payments.

How it works

Nexus standardizes the way instant payment systems connect. Instead of building custom connections for each country, payment system operators can connect to the Nexus platform once, allowing them to reach all other countries on the network. This approach enhances the efficiency and scalability of instant cross-border payments.

Parties Involved

- BIS (Bank of International Settlement): Leading the project
- Central Banks of : India, Malaysia, Philippines, Singapore, Thailand, and Indonesia (and their respective IPS)

Progress

Nexus is in its final stage (4th), where it will support a coalition of countries interested in implementing Nexus in their cross-border payment system.

Benefits

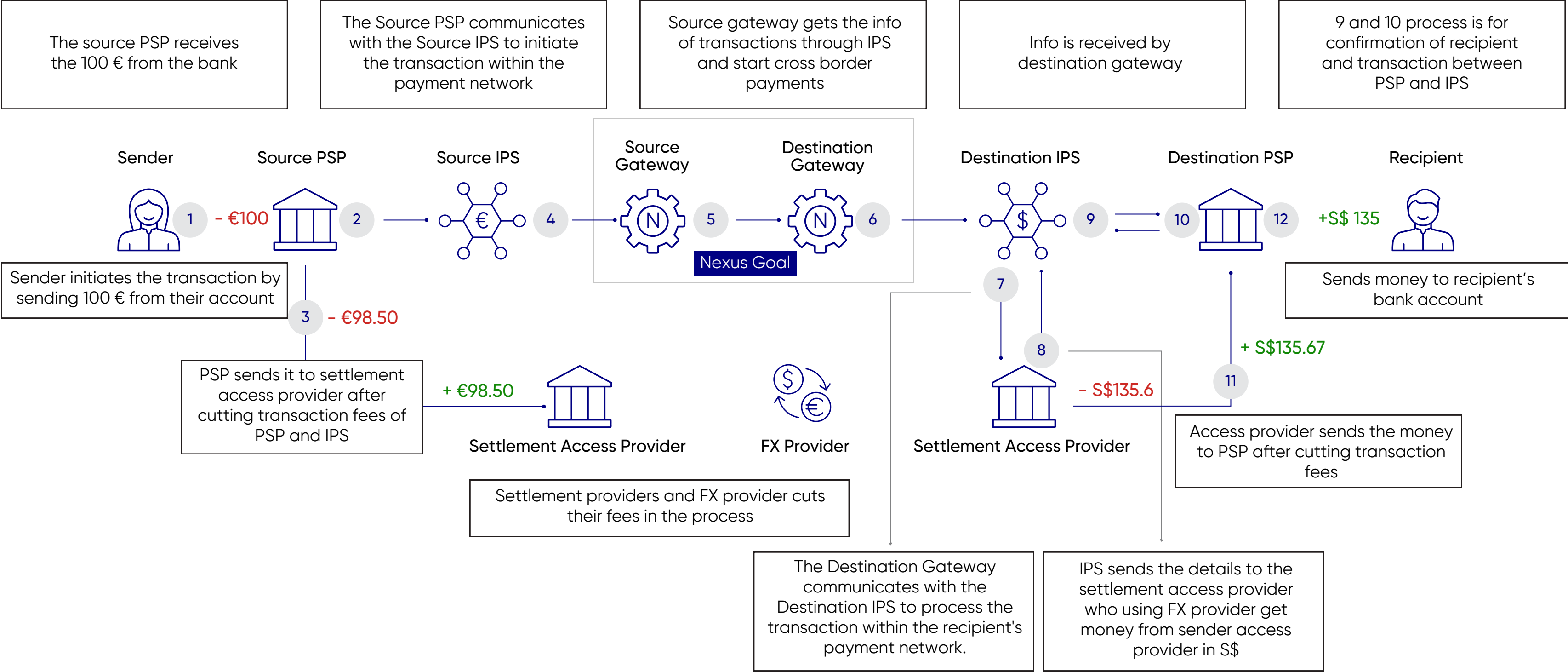
- Speed: Cross-border payments can be completed in 60 seconds or less, operating 24/7/365.
- Cost: Lower transaction fees and reduced administrative costs by eliminating the need for correspondent accounts.
- Access: Access through non-bank PSPs and simplified processes using proxies like mobile numbers.
- Transparency: FX rates and other fees will be shown upfront thereby sender knows the exact amount credited to the recipient
- Safety and Risk: Builds on existing IPS risk management frameworks, reducing reliance on correspondent banking and mitigating cross-border credit risk.

Current Situation

Currently, markets are running on old payment roads and various intermediaries which make the process highly inefficient and costly.

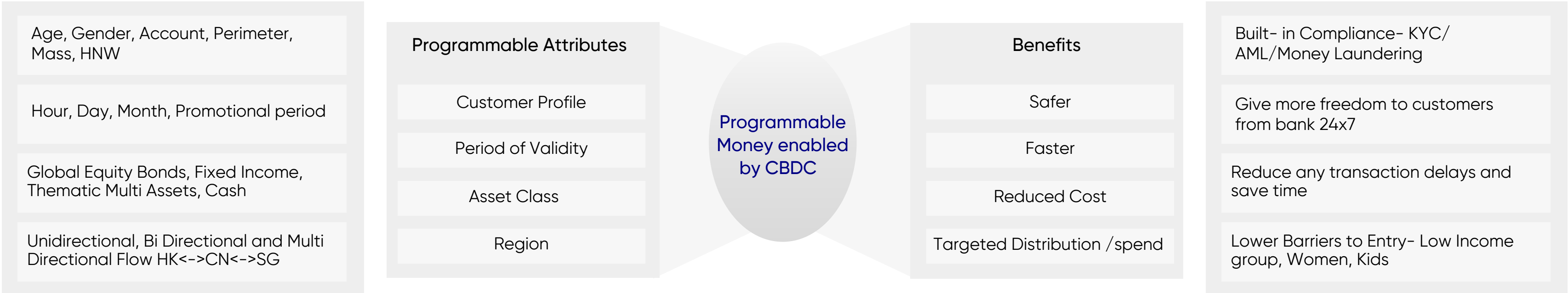
- Payments are made by sending messages which contains transaction data between financial institutions to update the account of sender and receiver, but these process differs with country which results in difficult of automation
- Regulations for payments and frauds, makes the compliance costlier
- Banks works on working hours which results in increase approval and transaction time
- Market is highly driven by big players which results in high cost
- Various bodies and countries are chained in a process that adds to delay and inefficiency

Project Nexus



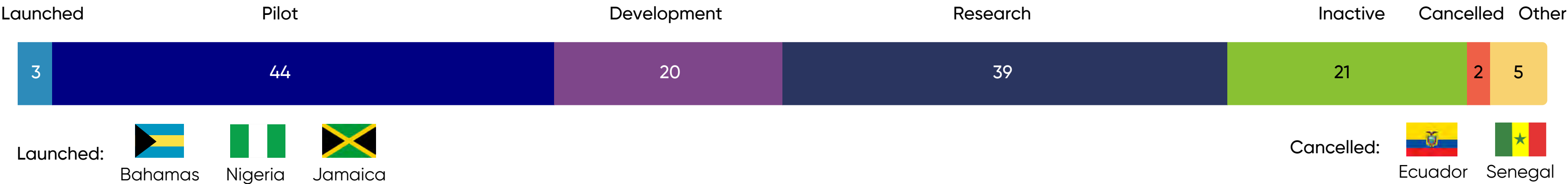
As a roadmap, Project Nexus may get integrated with Project mbridge, which is a multi CBDC platform.

Central Currency (CBDC) is a digital form of a country's fiat currency issued and regulated by its central bank. CBDCs are designed to be similar to cryptocurrencies, but they may not require blockchain technology or consensus mechanisms. CBDCs can be developed in a number of ways, including centralized and decentralized approaches. In a centralized approach, the central bank manages the ledgers that record transactions and also provides user-facing services. In a decentralized approach, the central bank sets rules and requirements for CBDC transactions, which are then recorded by users or financial intermediaries.



Timeline: Race for the future of money

Number of countries and currency unions exploring CBDC over time



Source: Atlantic Council

CBDC Use Cases



Use cases	Problem Statement	Solution and Impact
Automated Tax Deduction / Collection at Source Using CBDC	<p>Traditional tax collection systems often involve complex processes that can lead to inefficiencies, tax evasion, and high compliance costs for both taxpayers and tax authorities. Key challenges include:</p> <ul style="list-style-type: none">• Manual process• Compliance Burden• Tax Evasion• Delayed revenue collection	<p>CBDCs can automate tax deduction and collection processes through programmable features, significantly enhancing the efficiency and effectiveness of tax systems. Here's how:</p> <p>Real-Time Tax Deduction:</p> <ul style="list-style-type: none">• Instant Calculation: When a transaction occurs, the CBDC system can automatically calculate the applicable taxes based on pre-defined rules (e.g., VAT, sales tax).• Automatic Withholding: The tax amount can be automatically withheld at the point of sale or during transactions, ensuring that taxes are collected immediately rather than relying on post-transaction reporting. <p>Programmable Tax Features:</p> <ul style="list-style-type: none">• Smart Contracts: CBDCs can utilize smart contracts to automate tax calculations and payments. For instance, when a purchase is made, the smart contract can execute the tax deduction and transfer the funds directly to the tax authority.• Pre-filled Tax Returns: Transaction data stored in the CBDC system can be used to pre-fill tax returns for businesses and individuals, reducing the compliance burden and minimizing errors.
Direct Beneficiary Transfer	<p>Traditional methods of transferring benefits and subsidies often face challenges such as:</p> <ul style="list-style-type: none">• Leakage and Misuse• Delayed Payments• High Administrative Cost• Lack of Transparency	<p>CBDCs can streamline and enhance the DBT process in several ways:</p> <p>Programmable Money:</p> <ul style="list-style-type: none">• Conditional Payments: CBDCs can be programmed to ensure that funds are only used for specific purposes. For example, a CBDC issued for a subsidy (like LPG or fertilizer) can be restricted to transactions at authorized outlets, minimizing misuse.• Smart Contracts: Utilizing smart contracts, CBDCs can automate the transfer of funds based on predefined conditions, ensuring that payments are made only when specific criteria are met. <p>Improved Targeting and Efficiency:</p> <ul style="list-style-type: none">• Data-Driven Eligibility: CBDCs can be integrated with government databases to automate the verification of beneficiaries' eligibility, ensuring that assistance reaches those who truly need it.• Reduced Administrative Burden: The automation of the payment process reduces the administrative workload on government agencies, allowing them to allocate resources more effectively.

CBDC Use Cases



Use cases	Problem Statement	Solution and Impact
Trade Finance	<p>Trade finance traditionally involves complex processes that can lead to inefficiencies, high costs, and delays. Key challenges include:</p> <ul style="list-style-type: none">• Multiple Intermediaries• Slow Settlement Time• Lack of Transparency• Fraud and Risk Management	<ul style="list-style-type: none">• Smart Contracts: CBDCs can be programmed to execute smart contracts that automate payment processes based on predefined conditions (e.g., delivery confirmation). This reduces the need for manual intervention and minimizes the risk of disputes.• Conditional Payments: Payments can be made contingent upon the fulfillment of specific terms, enhancing trust between trading partners.• Reduced Fraud Risk: The secure and transparent nature of CBDC transactions reduces the risk of fraud, as all parties have access to the same information.• Enhanced Compliance: CBDCs can facilitate compliance with regulatory requirements by providing real-time data to authorities, reducing the burden on businesses.• Immutable Ledger: The use of blockchain technology in CBDCs ensures that all transactions are recorded on an immutable ledger, providing a transparent and traceable record of trade activities.• Real-Time Tracking: Businesses can track the status of their transactions in real time, allowing for better planning and risk management.
Wealth Management		<p>Central Bank Digital Currencies (CBDCs) have significant potential in transforming the wealth management industry.</p> <p>Tokenization of Assets</p> <ul style="list-style-type: none">• CBDCs enable the tokenization of various assets, including stocks, bonds, real estate, and commodities, by representing them as digital tokens on a blockchain.• This increases liquidity, accessibility, and efficiency in asset markets, as tokenized assets can be traded more easily and fractionally.• Tokenization also allows for programmable features, such as automated dividend payments or coupon distributions based on smart contracts. <p>Automated Portfolio Rebalancing</p> <ul style="list-style-type: none">• CBDCs can be programmed to automatically rebalance investment portfolios based on predefined rules or market conditions.• Smart contracts can execute trades and reallocate assets within a portfolio, reducing the need for manual intervention and ensuring timely rebalancing.

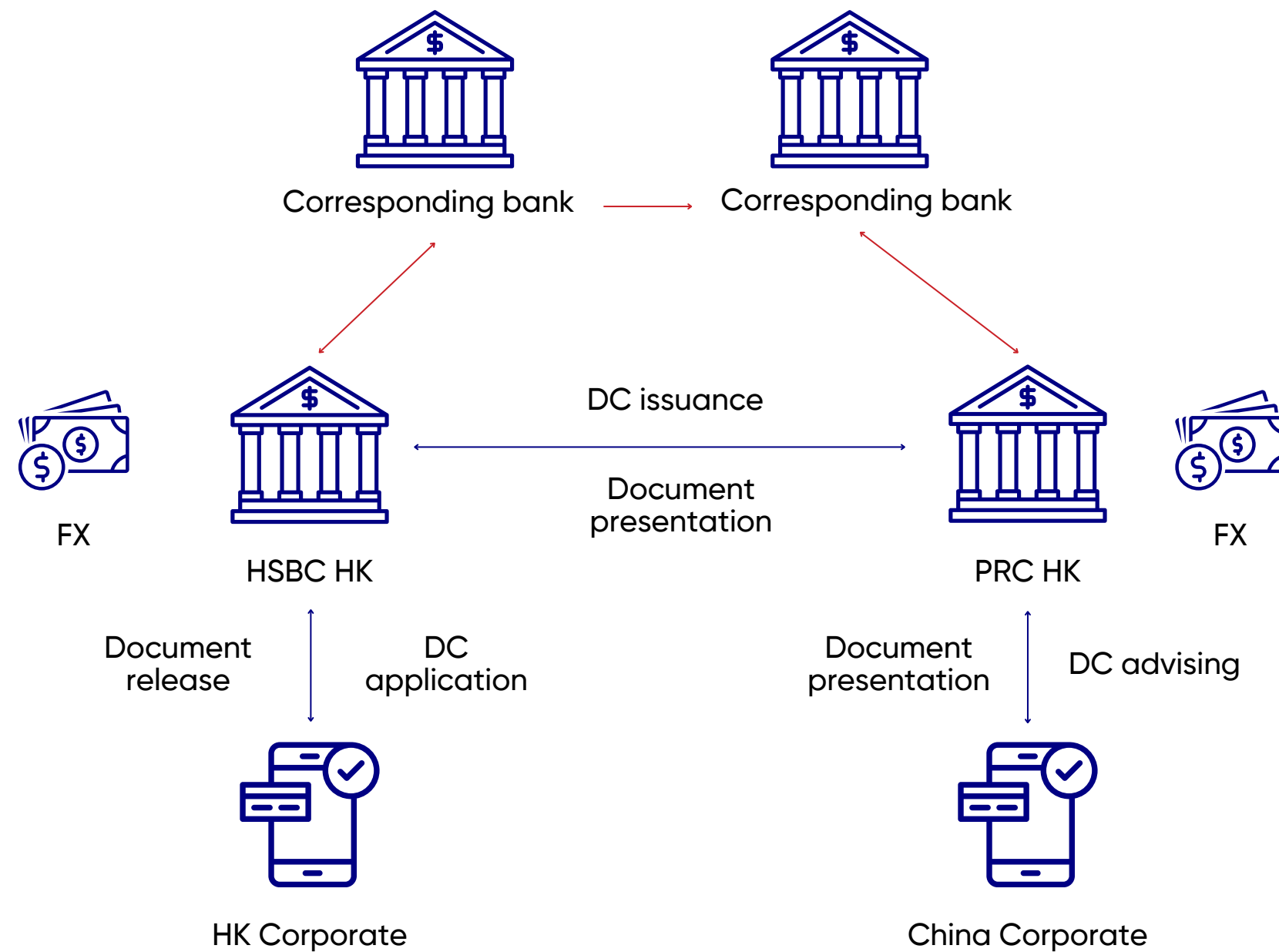
CBDC Use Cases



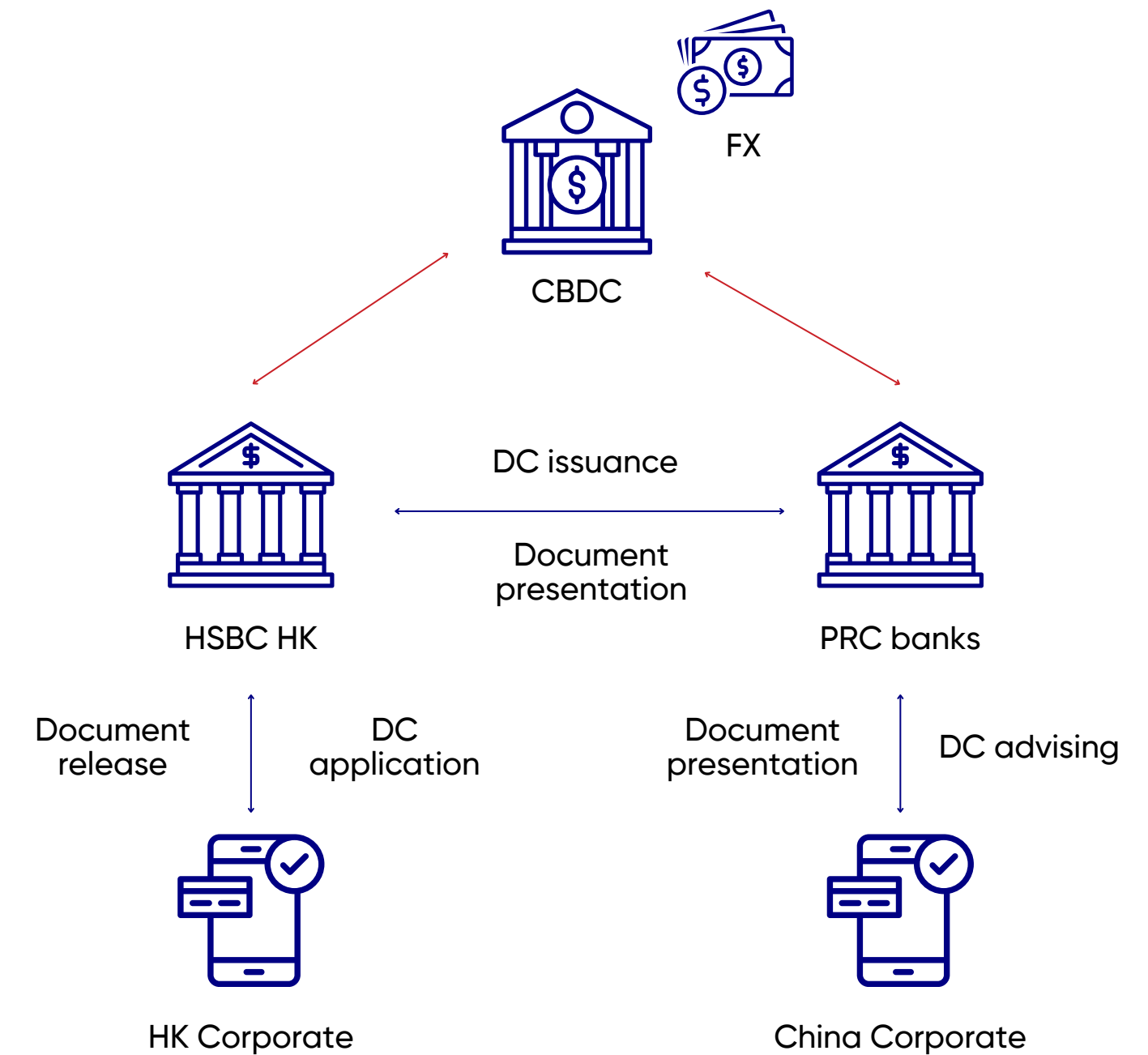
Use cases	Problem Statement	Solution and Impact
Cross Border Payment	<p>Current Challenges in Cross-Border Payments</p> <ul style="list-style-type: none">• High Costs: Traditional cross-border payment systems often involve multiple intermediaries, leading to high transaction fees.• Slow Settlement Times: Transactions can take several days to settle, particularly when multiple currencies are involved.• Regulatory Complexity: Different countries have varying regulations, which can complicate compliance and increase the risk of delays.• Lack of Transparency: Limited visibility into transaction statuses can lead to uncertainty for both senders and recipients.	<p>Reduced Transaction Costs:</p> <ul style="list-style-type: none">• Fewer Intermediaries: CBDCs can facilitate direct transfers between parties, bypassing the need for multiple banks and financial institutions. This reduction in intermediaries can significantly lower transaction fees.• Economies of Scale: As CBDCs gain adoption, the cost per transaction can decrease due to economies of scale, making cross-border payments more affordable. <p>Faster Settlement Times:</p> <ul style="list-style-type: none">• Real-Time Transactions: CBDCs can enable instant settlements, allowing transactions to be completed in seconds rather than days. This is particularly beneficial for businesses that rely on timely payments.• Elimination of Currency Conversion Delays: With interoperable CBDCs, transactions can occur directly in the digital currency of the sending and receiving countries, reducing the time spent on currency conversion. <p>Increased Transparency and Traceability:</p> <ul style="list-style-type: none">• Immutable Ledger: CBDCs utilize blockchain technology, providing a transparent and immutable record of all transactions. This enhances accountability and reduces the risk of fraud.• Real-Time Tracking: Both parties can track the status of their transactions in real time, improving visibility and reducing uncertainty. <p>Enhanced Regulatory Compliance:</p> <ul style="list-style-type: none">• Built-In Compliance Features: CBDCs can incorporate features that ensure compliance with anti-money laundering (AML) and counter-terrorism financing (CTF) regulations, making it easier for financial institutions to adhere to legal requirements.• Standardization: The use of CBDCs can lead to the establishment of standardized protocols for cross-border transactions, simplifying compliance across jurisdictions. <p>Interoperability Between Countries:</p> <ul style="list-style-type: none">• Collaborative Frameworks: CBDCs can be designed to be interoperable, allowing for seamless transactions between different countries' digital currencies. This requires cooperation between central banks to establish common standards and protocols.• Cross-Currency Transactions: If allowed, CBDCs can facilitate cross-currency payments without the need for traditional currency conversion, streamlining the process. <p>Examples of CBDC Initiatives for Cross-Border Payments.</p> <ul style="list-style-type: none">• Project Aber: A collaboration between the central banks of the United Arab Emirates and Saudi Arabia to explore the use of CBDCs for cross-border payments, testing a joint digital currency for both local and international transactions.• Project Inthanon-LionRock: A joint initiative between the Bank of Thailand and the Hong Kong Monetary Authority that successfully demonstrated cross-border payments using CBDCs, achieving fast transaction times and reduced costs.

Comparison of Trade Payment Flow: Existing vs CBDC

Existing trade payment model



Potential trade payment model with CBDC



→ Payment flow → Trade document flow

BIS Innovation Hub

Projects on Central Bank Digital Currency (CBDC)



Projects	Overview
Project m bridge	Project mBridge experiments with a multiple-central bank digital currency (multi-CBDC) common platform for wholesale cross-border payments. It seeks to solve some of the key inefficiencies of cross-border payments, such as high costs, low speed and transparency, and operational complexities. Project mBridge continues its development and has reached the minimum viable product (MVP) stage, while broadening its international reach.
Project Rialto	The Bank for International Settlements (BIS) is launching Project Rialto to explore how instant cross-border payments could be improved using a modular foreign exchange (FX) component combined with settlement in wholesale central bank digital currencies (wCBDC).
Project Aurum 2.0	Project Aurum 2.0 will focus on how to use technologies to enhance privacy for retail central bank digital currencies (CBDC). The project is a collaboration between the Hub's Hong Kong Centre and the Hong Kong Monetary Authority and builds on the existing Aurum prototype
Project Tourbillon	Project Tourbillon is a project launched by the BIS Innovation Hub's Swiss Centre which explores how to improve cyber resiliency, scalability and privacy in a prototype Central Bank Digital Currency (CBDC).
Project Mandala	Project Mandala explores the feasibility of encoding jurisdiction-specific policy and regulatory requirements into a common protocol for cross-border use cases such as foreign direct investment, borrowing and payments.
Project Polaris	As part of Project Polaris, the BIS Innovation Hub Nordic Centre has published a comprehensive handbook exploring key aspects of how central bank digital currencies (CBDCs) could work for offline payments, a security a resilience framework for CBDC systems and a paper on Closing the CBDC threat modelling gaps.

BIS Innovation Hub

Projects on Central Bank Digital Currency (CBDC)



Projects	Overview
Project Mariana	Project Mariana explores automated market-makers (AMM) for the cross-border exchange of hypothetical Swiss franc, euro and Singapore dollar wholesale CBDCs. It will seek to examine the potential for financial institutions to settle foreign exchange trades in financial markets. Mariana is a joint project of the BIS Innovation Hub, the Bank of France (within the Eurosystem), the Monetary Authority of Singapore and the Swiss National Bank.
Project Sela	Project Sela, a joint experiment by the Bank for International Settlements (BIS) and the central banks of Hong Kong SAR and Israel, has proven the feasibility of a retail central bank digital currency (rCBDC) ecosystem that combines accessibility, competition and preventative cyber security, while retaining key advantages of physical cash.
Project Rosalind	Developing a retail central bank digital currency (CBDC) system is a significant undertaking and there are many areas that central banks need to explore including: How to improve public-private sector collaboration? How to maximize interoperability, encourage competition and enable adoption? How might retail CBDC meet current and future consumer needs in a fast-changing payments landscape? Project Rosalind, aims to help answer some of these questions.
Project Dunbar	Project Dunbar explores how a common platform for multiple central bank digital currencies (multi-CBDCs) could enable cheaper, faster and safer cross-border payments. It identified challenges of implementing a multi-CBDC platform shared across central banks and proposed practical design approaches to address them.
Project Helvetia	Project Helvetia explored how central banks could offer settlement in central bank money in a future in which more financial assets are tokenised and financial infrastructures run on distributed ledger technology (DLT), focusing on operational, legal and policy questions.
Project Jura	Project Jura explores cross-border settlement of tokenised assets between financial institutions in wholesale central bank digital currencies (wCBDCs) on a distributed ledger technology (DLT) enabled platform.

Emerging Trends: B2B Cross Border Payments



Particulars	Cross Border Payments for B2B transactions
Total Addressable Market	Inward Remittance: By 2030, \$2.0T in exports is expected, with MSMEs contributing 50%. Fintech is projected to handle 20% of payments, equating to \$400B. Outward Remittance: India's overall exports of goods and services in 2024 has been estimated to cross USD 814 billion, an increase of 5.58 %.
Key Regulatory Aspects	<ul style="list-style-type: none">• After the PA-CB guidelines, now the entitles come under direct regulation of RBI, as opposed to supervision through AD Banks.• In respect of import and export transactions processed by PA-CBs, the maximum value per unit of goods / services sold / purchased must not exceed be INR 25,00,000.• PA-CBs must undertake due diligence of the buyer if per unit goods / services imported is more than INR 2,50,000.• Only transactions for permissible goods/ services under the Foreign Trade Policy may be facilitated by Cross-Border Pas.
Potential Opportunity for start-ups in the space	<ul style="list-style-type: none">• Startups solving for MSME use cases will have opportunity to process around \$200 bn
New Technology/ Rails	<ul style="list-style-type: none">• Onboarding Stack• Compliance Engines for faster processing and reduction of Frauds• Globalization of Local Payment rails i.e. UPI
Challenges (existing) and Benefits/Improvement by new age players	<p>Existing challenges (before) :</p> <ul style="list-style-type: none">• Swift messaging and RDA• High costs and slower process (Time taken: 4-5 days and Non-transparency in terms of cost break-down)• Long and complicated processing along with lack of transparency.• <p>Benefits and improvements (after):</p> <ul style="list-style-type: none">• Blockchain transactions, self and optimized usage of rails, multi currency accounts• Time taken is less than 2 days for settlement• Process and cost breakdown is much more transparent and clearer

Emerging Trends: B2B Cross Border Payments



Particulars	Cross Border Payments for B2B transactions
Other Key Considerations	<ul style="list-style-type: none">• Segment is prone to money laundering, tax evasion thus one requires a robust Fraud Risk Management solution, KYC, Tax Compliance etc• Acquiring large accounts will be challenging, as they have long-standing relationships with the bank, conducting transactions directly and benefiting from a dedicated point of contact (SPOC). However, with new age commerce channels (social commerce) new solutions from Fintechs will help making inroads. To win over these major clients, it will be necessary to offer value-added services beyond the plain vanilla gateway solution.• At present, companies entering this space are prioritizing inward remittances over outward remittances due to the latter's more complex processes and stricter regulations. It will be intriguing to see when start-ups begin facilitating outward remittances as well.
Companies	<div><div>BRISKPE</div><div> PayGlocal™</div><div> Xflow</div><div> skydo</div></div>

Interview with Briskpe



BRISKPE

Sanjay Tripathy

Co-founder & CEO

Banks have traditionally been processing payments through swift. Has anything changed in this? Do we have more rails available now?

Traditionally, SWIFT has been the backbone of cross-border payments for banks. However, the increasing demand for speed, efficiency, and lower costs has spurred the development of alternative payment rails.

SWIFT's Adaptation

While still a dominant player, SWIFT has responded to these pressures. Initiatives like SWIFT gpi have enhanced cross-border payments by providing end-to-end tracking and accelerating processing times. Nevertheless, the landscape has broadened.

Real-Time Payment Systems

Domestically, real-time payment systems have gained traction:



SEPA Instant Credit Transfer (SCT Inst) offers instant Euro transfers within the Single Euro Payments Area.



Faster Payments Service (FPS) enables near-instant domestic transfers.



FedNow and RTP provide near-instant domestic payment solutions.

Blockchain and Cryptocurrencies

Blockchain technology has introduced new possibilities:

- *Ripple (XRP): Often touted as a SWIFT alternative, Ripple leverages blockchain for faster and cheaper cross-border payments.*
- *Stablecoins: These cryptocurrencies pegged to fiat currencies are gaining popularity for cross-border transactions due to their speed and lower fees.*

Interview with Briskpe



Alternative Cross-Border Payment Networks

Beyond SWIFT and blockchain, other networks are emerging:

Visa Direct and Mastercard Send: These leverage existing infrastructure for fast, secure cross-border payments.
Fintech Innovations: Companies like BRISKPE are bypassing traditional correspondent banking networks by offering local collection facilities and partnering with providers like Currencycloud.

Central Bank Digital Currencies (CBDCs)

Several countries are exploring or piloting their digital currencies (e.g., China’s Digital Yuan), which could eventually become a significant player in cross-border payments.

Unit economics : Fintechs are charging around 2% - 2.5% for cross border payments. How does this compare to rates charged by a bank? How will you differentiate and ensure this does not become a margin game e.g. domestic payments in India

Fintechs have disrupted the traditional banking landscape, particularly in cross-border payments. While banks typically charge hefty fees, ranging from 3% to 6% including hidden charges and unfavourable exchange rates, fintechs have introduced a more competitive pricing model, often charging between 2% and 2.5%. Players like BRISKPE charge 1% or less (all inclusive).

To avoid a commoditization of the market and prevent a margin war similar to the domestic payments industry, fintechs must focus on differentiation. This involves offering a superior customer experience, emphasizing value-added services, and leveraging technology to reduce costs and improve efficiency.

Key differentiators include:

- 

Speed of transaction:
Faster settlement times compared to traditional banking channels.
- 

Transparency:
Clear fee structures and real-time transaction tracking.
- 

Competitive exchange rates:
Offering more favourable rates than banks
- 

Personalized customer support:
Providing dedicated support tailored to individual needs.

Interview with Briskpe



While dealing with cross border payments, how do you deal with compliances and licences in different countries. Do you need to open a bank account in every country you operate in?

Cross-border payments are subject to a complex web of regulations that vary significantly between countries. Adhering to these requirements is essential for businesses to operate legally and mitigate risks. To operate legally, you must obtain relevant licenses in each jurisdiction, which may require local partnerships or establishing entities in those regions. This often involves understanding local regulatory frameworks and meeting specific capital requirements.

Strict adherence to Anti-Money Laundering (AML), Counter-Terrorism Financing (CTF), and Know Your Customer (KYC) regulations is crucial. Data privacy laws also need to be considered when handling customer information across borders.

However, opening a bank account in every country isn't always necessary. Fintechs often leverage partnerships with local banks or payment processors to manage transactions, ensuring compliance without the need for physical presence in each market. This approach balances regulatory adherence with operational efficiency.

How would you compare to PayPal - money movement, Nium - infrastructure play?

PayPal and Nium are both significant players in the fintech landscape, but they occupy distinct niches.

Feature	PayPal	NIUM
Target Market	Primarily consumers and small businesses	Primarily businesses and fintech companies
Core Service	Consumer-to-consumer and consumer-to-business payments	Payment infrastructure, platform services
Business Model	Transaction fees, merchant fees	Platform fees, licensing fees
Brand Recognition	High	Lower, primarily among industry insiders

Interview with Briskpe



Unlike infrastructure-focused providers like Nium, our company BRISKPE, operates as a payment aggregator specializing in cross-border transactions. This positions us as a direct competitor to PayPal, offering a similar focus on facilitating seamless international payments. Our platform is designed to provide a streamlined experience for businesses engaged in global commerce.

Inward remittance is better solved for India by Fintechs, but how can Fintechs make outward remittance easier given the higher paperwork requirements?

India's fintech sector has shown remarkable prowess in facilitating inward remittances. However, outward remittances continue to be hampered by complex procedures and stringent regulations. To address these challenges and provide a seamless experience for customers, fintechs can adopt the following strategies:

End-to-End Digital Onboarding:

By leveraging e-KYC and e-signature technologies, fintechs can streamline the customer onboarding process, reducing paperwork and processing time. This aligns with the RBI's push for digital onboarding and customer verification.

Intelligent Document Management:

Employing AI-driven OCR and document verification systems can significantly expedite the processing of mandatory documents. This not only saves time but also minimizes errors.

Seamless Digital Platforms:

Creating intuitive platforms that integrate all remittance-related functions, from transaction initiation to tracking, provides a holistic user experience.

Robust Banking Integration:

Deep integration with Indian banking systems is crucial for smooth fund transfers. Fintechs need to prioritize real-time connectivity and adherence to RBI's interoperability standards to ensure swift and accurate transactions.

API-Driven Ecosystem:

Implementing API-based integrations can automate routine tasks, reduce manual intervention, and accelerate the remittance process. Automated Compliance: Leveraging AI and machine learning for automated compliance checks can help fintechs navigate the complex regulatory landscape.

Real-Time Tracking and Transparency:

Providing customers with real-time visibility into remittance status, including exchange rates and fees, builds trust and enhances customer satisfaction.

Interview with Briskpe



Personalized Customer Support:

Offering AI-powered chatbots or human support can assist customers in navigating the remittance process and addressing queries efficiently.

RegTech Adoption:

Utilizing RegTech solutions can help fintechs simplify compliance processes, reduce operational risks, and ensure adherence to RBI regulations.

Advanced Fraud Prevention:

Implementing robust fraud detection systems, including AI-powered anomaly detection, is essential to safeguard customer funds and maintain trust.

With Gift City allowing the opening of dollar accounts, does this facilitate easier outward remittance?

Gift City has the potential to simplify outward remittance; by allowing the opening of dollar accounts, Gift City enables Indian businesses and individuals to directly hold and transact in USD, bypassing the need for currency conversion that typically adds layers of complexity and cost to outward remittance. But the full impact will depend on how the new IFSC Payment Service Regulations are practically implemented and adopted. The real-world benefits are yet to be fully realized. The ease of integrating these dollar accounts with existing banking infrastructure in India and abroad will also play a crucial role.

There is a Project Nexus started by BIS. How does this solve for the cross border payment issue. Would you be riding this rails or is this a competition.

Project Nexus, by creating a unified infrastructure for cross-border payments, has the potential to significantly enhance efficiency and reduce costs for fintech businesses like ours. The platform aims to enable cross-border transactions within seconds, operating 24/7/365. This is like UPI going global. The platform supports various payment types including P2P, B2B, B2C, and C2B transactions. While we see it as a complementary platform rather than a competitor, a deep understanding of its technical specifications and governance structure will be crucial for us to effectively leverage its capabilities. By focusing on our core competencies and building value-added services on top of this infrastructure, we can create a compelling proposition for MSMEs and navigate the evolving cross-border payments landscape.

Emerging Trends: Payment Frauds



Particulars	Payment Frauds
Amount	According to recent data from the Reserve Bank of India (RBI), payment fraud in India has grown five fold, surging to INR 1,457 billion in the fiscal year ending March 2024. The primarily driver has been the rapid adoption of UPI (Unified Payments Interface) and digital account opening across the country.
Fraud Mechanism	Scams are the primary mode with innovative approaches including Digital Arrest, Investment Scam, Crypto Scam, Business email compromise, Whatsapp scams, Social Media scams, Romance Scams, Imposter scams, Tech Support Scam, Fake invoice etc.
New Age Vectors	Social Engineering is the largest threat vector. The use of mule accounts as a via media to move money is the key focus area for scam mitigation.
Regulatory Tailwinds and emphasis of regulator	The Reserve Bank of India (RBI) directives on fraud mitigation primarily focus on establishing robust systems for early fraud detection, timely reporting, and robust governance practices within banks, including mandatory reporting of frauds, utilizing a Central Fraud Registry, implementing strong customer authentication. The RBI also operated a Regulatory Sandbox to identify solutions to combat payment frauds and mule accounts RBIH has created a solution called MuleHunter.ai
Potential Opportunity for start-ups	The enhanced focus on Risk and Compliance by the regulator will translate to increased tech spend by the Banks over the next two years. Solutions at different sections of the problem ranging from data vendors that prevent onboarding issues, solutions for behavioural monitoring, IP monitoring and transaction monitoring should all see increased traction.
Notable Companies	India: Drona Pay, Clari5, Wibmo Global: Feedzai, Signifyd, Sift
Key Challenges in space	<ul style="list-style-type: none">• Evolving fraud techniques making it difficult to stay ahead of new threat• False positives• Building systems capable of handling high transaction volumes• Customers always look from a cost- benefit analysis of making investments in fraud prevention technologies and compliance adherence.• Difficulty in managing fraud risks in international payments, which involve varying regulations, currencies, and verification standards.• Higher TAT for onboarding clients as product is only suited only for large enterprises• Compete with global players

New Age Payment Frauds



Few of the most famous old age frauds are- Phishing, Vishing, Online sales, Fraud Skimming, Screen Sharing Access, SIM Swap/cloning, Lottery Frauds, Fake advertisement for loans, Fake loan websites.

Type of Fraud	UPI	E-Wallets	Cards	Bank Transfer	Modus Operandi	Steps to prevent
Compromising credentials			Yes	Yes	Fraudsters create fake search engine results of bodies such as government, insurance and banks to steal credentials via query form or phone calls to collect personal information	<ul style="list-style-type: none"> • Always obtain customer care contact details through official website only • Do not call on numbers displayed on search engine as they are often camouflaged • Customer care number are never in the form of mobile numbers • No banks or official bodies ever ask for OTP and passwords
QR code scan	Yes	Yes			Fraudsters use malicious QR codes to make customers unknowingly authorize them to withdraw money from their account.	<ul style="list-style-type: none"> • QR code have account details embedded in them to transfer money to a particular account, only scan legitimate QR codes • You do not to scan QR code to receive money as well as receipt transactions
Impersonation	Yes	Yes	Yes	Yes	Fraudsters impersonate individuals on social media to scam others.	<ul style="list-style-type: none"> • Always verify the genuineness of a fund request from a friend/ relative by confirming through a phone call/meeting • Do not make payments to unknown person online • Do not share personal or confidential details on social media platforms
Juice jacking	Yes	Yes	Yes	Yes	Fraudsters use public charging stations to steal data from connected devices and transfer malware to customers devices	<ul style="list-style-type: none"> • Avoid using public/unknown • chargers/ports/cables

New Age Payment Frauds



Type of Fraud	UPI	E-Wallets	Cards	Bank Transfer	Modus Operandi	Steps to prevent
Online Job Fraud	No	No	Yes	Yes	Fraudsters post fake job listings and interviews to steal personal information or money	<ul style="list-style-type: none"> Genuine company will never ask for money for offering a job Do not make payments on unknown job search websites Always ask for the reason of payment and their details
Money Mules	No	No	No	Yes	Fraudsters trick individuals into laundering money for attractive commission or via emotional stories. Such individuals creates a chain of transferring to each other where at the end fraudsters gain the money through bank transfer or cash	<ul style="list-style-type: none"> Do not act as a medium to transfer money from one account/person to another Do not respond to emails asking for your bank account details. Do not get carried away by attractive offers / commissions and give consent to receive unauthorised money and to transfer them to others or withdraw cash and give it out for a handsome fee. If someone sends the money to you by mistake and asks to send it to someone else, do not do so.
SMS/Email/Instant Messaging scam	Yes	Yes	Yes	Yes	Fraudsters send fake messages to steal personal information or money by asking for some upfront fees such as advance EMI, GST, etc	<ul style="list-style-type: none"> Never believe loan offers made by people on their own through telephones / emails, etc. Never make any payment against such offers or share any personal / financial credentials against such offers without cross-checking that it is genuine through other sources. Never click on links sent through SMS / emails or reply to promotional SMS / emails. Never open / respond to emails from unknown sources containing suspicious attachment or phishing links
OTP based fraud	Yes	Yes	No	No	Fraudsters trick victims into sharing OTPs to gain unauthorized access.	<ul style="list-style-type: none"> Genuine companies and service callers never ask for any OTPs Fraudsters create a sense of emergence, else something negative will happen, never believe so and share your details and OTP Regularly check your SMS and email to ensure no OTP is generated without your knowledge

Interview with Drona Pay



Satish Kashyap

CEO & Co-Founder

Let's begin by discussing the difference in fraud percentages between developed countries and India, particularly in relation to transaction volumes. How do factors like two-factor authentication impact these numbers?

There's a significant difference in fraud percentages between developed countries and India, primarily due to two-factor authentication. In India, the fraud rate is less than half of what we see globally. For example, in the US, the fraud loss is around 2.5% to 3%, while in India, it's between 0.5% and 1%. Two-factor authentication has been a key factor in keeping these numbers low, although it does add some friction to the user experience.

With the rise of generative AI (Gen AI), what new solutions do you believe will emerge, and how can they enhance enterprise products?

Generative AI offers exciting possibilities, but it's crucial to validate AI-generated outputs to avoid issues like hallucination. We experimented with using Gen AI to create rules for transaction monitoring. For example, we tried generating a rule to alert us when a customer who hasn't made an international transaction in the last year suddenly does one over ₹50,000, and block it if it's over ₹75,000. While Gen AI did well with basic rules, it struggled with more complex scenarios. We found it more effective as a rule tester rather than a rule creator. Recent advancements, like OpenAI's structured output guarantee and Microsoft's Graph Rank, could further enhance the accuracy and efficiency of these processes.

How does Graph Rank improve the application of rules, particularly in preventing redundancy?

Graph Rank helps in connecting the right set of information without redundancy, which is crucial when dealing with multiple overlapping rules. Previously, redundant rules could cause issues, but with these tools, you can apply rules independently or in combination, significantly improving accuracy. For example, Graph Rank's research shows 99.8% accuracy, which is impressive. We've been exploring these tools in combination with our existing solutions, and they seem promising.

How do you see the differentiation between legacy players and New Age fintech companies like yours, especially regarding solution offerings?

Legacy players were built during a batch processing era, focusing on low-volume transactions with higher loss ratios. In contrast, New Age companies like ours prioritize real-time, configurable solutions tailored to specific product types and threat vectors. We emphasize scalability and the ability to deploy across various cloud platforms. The shift towards real-time processing and customization is essential, and as regulatory pressure increases, many legacy systems may struggle to keep up.

Interview with Drona Pay



Regarding your engagements with established banks like Axis Bank, have you explored collaborations or product integrations with them?

Yes, we've engaged with Axis Bank before and are open to further discussions. Every new product launch presents an opportunity for collaboration. For instance, they might need our solutions for a new Forex card product or a Neo banking front-end. These engagements often lead to broader integration, and we aim to be the go-to partner when these banks recognize the need for more advanced, real-time solutions.

You touched on generative AI earlier. Could you elaborate on its specific use cases in your operations?

Generative AI is particularly useful in wealth management and transaction monitoring. One use case is market correction planning, where we use AI to determine immediate actions in response to market changes. It analyzes various variables like locked-in funds, short-term capital gains, and exit loads to provide specific, actionable insights. Generative AI helps with three main areas: making investment decisions, optimizing current portfolios, and devising strategies for adverse market scenarios.

When institutions already have long-standing vendors, how do you convince them to consider your solutions?

Institutions might not want to replace their existing systems immediately, but as they launch new products or face new challenges, they realize the limitations of their legacy systems. This is where we come in. We offer our solutions for these new products, gradually building a case for broader adoption. It's about showing that we can solve their current problems while being a reliable partner for future needs.

What are your thoughts on launching new products that could act as door openers for deeper engagements with clients?

Every new product launch is an opportunity. When institutions are looking to introduce a new product, such as a Forex card or a Neo banking front-end, it's the perfect time to bring in a new vendor. They may not replace their entire system immediately, but by introducing our solutions with these new products, we can slowly replace older systems as they evolve. This approach allows us to build trust and integrate deeper into their operations over time.

How do you ensure that your technology solutions can scale and remain effective as they expand to new use cases?

Scaling our technology solutions effectively requires continuous testing and refinement. For instance, when UPI started handling international payments, the security framework remained the same, but as the product gained traction, new threat vectors emerged. We need to be prepared for such scenarios and refine our solutions as new challenges arise. By continuously evolving our technology, we can ensure that it remains effective and scalable.

Interview with Drona Pay



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Lending

Interview with DLAI



Munish Lunia

Co-Founder

Can you talk about DLAI, its genesis, and how it manages the diverse interests of stakeholders in the personal loan, MSME, and P2P spaces?

DLAI was established about eight years ago, recognizing the importance of digital proliferation in lending. Our initial goal was to ensure that regulators and industry stakeholders understood digital lending practices. Over time, we have expanded to include consumer lenders, MSME lenders, and LSPs (Loan Service Providers)

We represent over 120 members and engage with regulators like RBI on key issues such as KYC policies. Our organizational structure includes an executive committee, a CEO, and various specialized committees focused on knowledge sharing and policy development. Our members include major players like DMI, Axio, Lendingkart, Money View, and Paytm, representing a mix of consumer and business lenders.

When engaging with policy makers, such as during pre- and post-COVID periods, we have successfully highlighted the importance of key policies like C-KYC and video KYC. Our unified representation helps us achieve a better policy level engagement with regulators and industry participants, ensuring that consumer lenders, MSME lenders, and LSPs benefit equally.

The recent RBI regulations on consumer lending haven't been favorable. How is DLAI addressing these challenges, and what changes you are advocating for with the government?

Our primary focus is on consumers. We emphasize fraud prevention and consumer awareness, ensuring that market participants do not overgeneralize small-ticket loans as risky. By collecting data and insights from our members, we present a consolidated view to policymakers, which is more impactful than individual feedback.

The Policy makers like SIDBI and RBI have been very receptive and proactive. We regularly communicate with them through meetings and written representations. For example, when the draft regulations around small-ticket loans were proposed, we compiled feedback from our members and presented a data-backed response to the policy makers

Interview with DLAI



ONDC and OCEN are emerging platforms in SME lending. How is DLAI ensuring a unified architecture to help lenders expand their loan books and reach granular markets?

We have been working closely with iSPIRT and Sharad Sharma's team for several years. MSME lending faces challenges such as KYC issues, cash flow based eligibility and repeat customer engagement. Platforms like OCEN are making interventions at the regulatory and operational levels to address these challenges.

We act as partners with iSPIRT and also collaborate with platforms like ONDC to ensure that the customer is the ultimate winner and we deepen the ecosystem. Many of our members have participated in RBI innovation sandboxes, which allow them to test new ideas and models. ONDC initially focused on e-commerce but is now expanding into financial services, including MSME, personal, gold, and home loans. Their platform is almost ready, and we expect engagement with ONDC to increase. Previously, their focus was on e commerce expansion, but now they are shifting towards financial services, creating new opportunities for digital lenders.

What steps is DLAI taking to protect consumers from predatory lending practices, especially given the rise of unregulated Chinese lending apps?

DLAI enforces a strict code of conduct for its members, aligned with RBI's Fair Practices Code. This includes transparency in credit pricing and clear communication with consumers. We regularly audit our members to ensure compliance and have a zero-tolerance policy for violations.. Recently, we updated this code to version 2.0 and shared it with RBI to demonstrate our commitment to consumer protection.

We also launched initiatives like FinTech Suraksha Week and Cyber Suraksha Week to educate consumers on safe lending practices. Additionally, DLAI operates a call center for consumer complaints and provided a list of whitelisted apps to RBI to differentiate legitimate lenders from fraudulent ones.

How is DLAI contributing to financial inclusion, particularly for underserved segments?

Many of our members focus on lending in tier-3 towns and below, where traditional banks have limited presence. For example, 60- 70% of loans disbursed by DLAI members are in underserved regions, with amounts typically under ₹10 lakhs.

Our members such as NeoGrowth, Indifi, Paytm, Cred and Lendingkart and FlexiLoans, lending to MSMEs collectively disburse around ₹7,000-8,000 crore per month, providing crucial funding to MSMEs that would otherwise lacking in access to formal credit. We also present this data to the policymakers at appropriate forums to highlight the significant role digital lenders play in financial inclusion.

What is the minimum criteria for lenders or NBFCs to join DLAI, and what are the associated fees?

All Fintech fraternity is welcome to join the DLAI. Membership fees are based on the lender's AUM or profitability and vintage. The base fee is the same for all members, with options for additional subscriptions to exclusive events like the Conclave and sponsorship opportunities.

Interview with DLAI



What are the key trends in the lending space you anticipate over the next five years, and how can digital lenders balance growth with responsible lending?

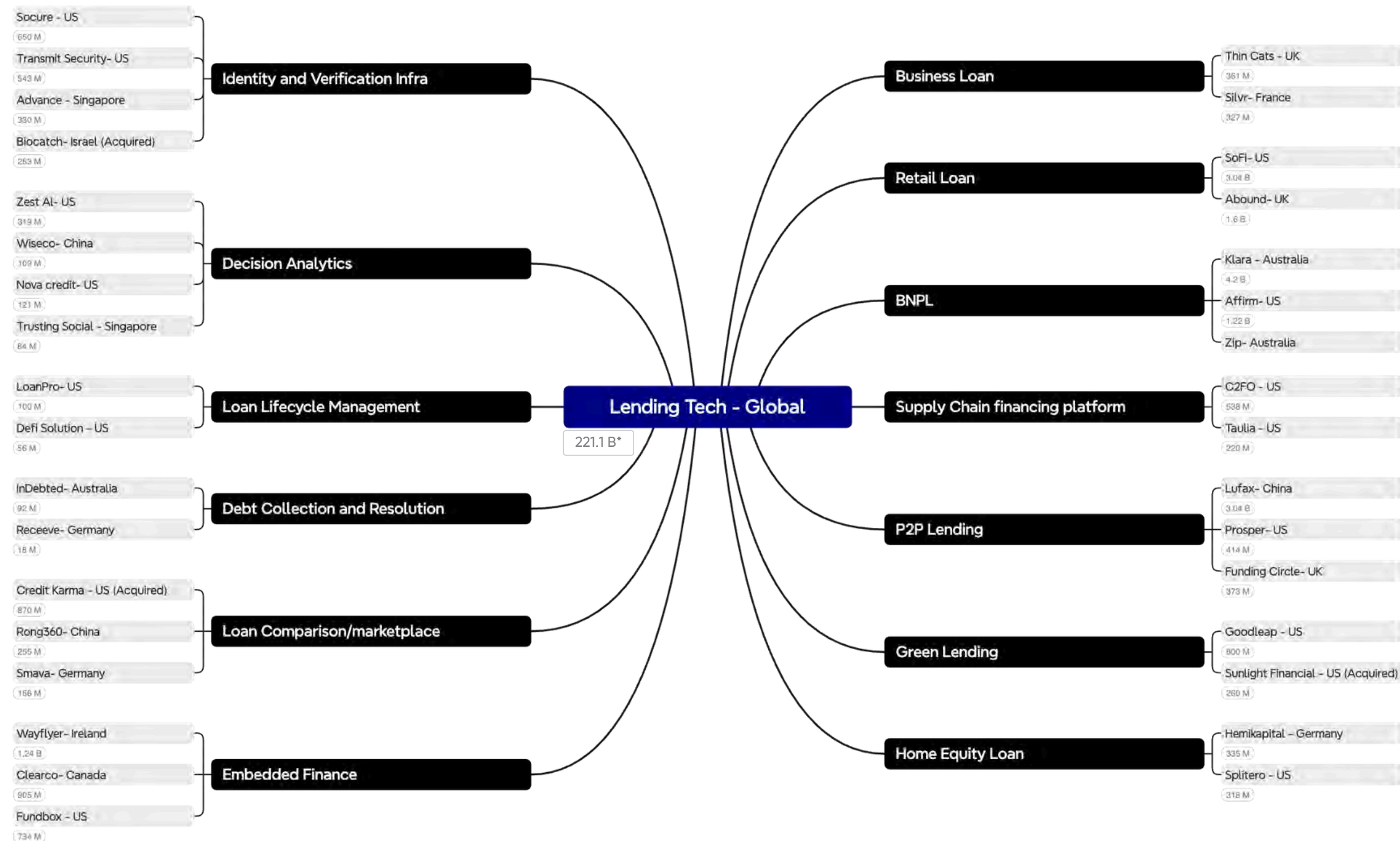
- **Shift from Informal to Formal Lending :** *As digital data becomes more accessible, informal lending will decline. Merchants who traditionally borrow at high rates from informal sources will transition to formal credit options.*
 - **Data-Driven Credit Models :** *Traditional balance sheet-based lending will be replaced by models that analyze real-time cash flow, payment history, and transaction velocity. This shift will enable more accurate credit assessments and broader access to financing.*
 - **AI-Driven Customer Journeys:** *AI will simplify the customer experience by addressing language and comprehension barriers. Many potential borrowers abandon applications due to confusion over terms like "vintage" or "incorporation." AI chatbots and voice interfaces will improve onboarding, customer servicing, and collections.*
- Responsible lending will be supported by adherence to regulatory standards and proactive monitoring to prevent fraudulent activities.*

Is there anything else you'd like to highlight that we haven't covered?

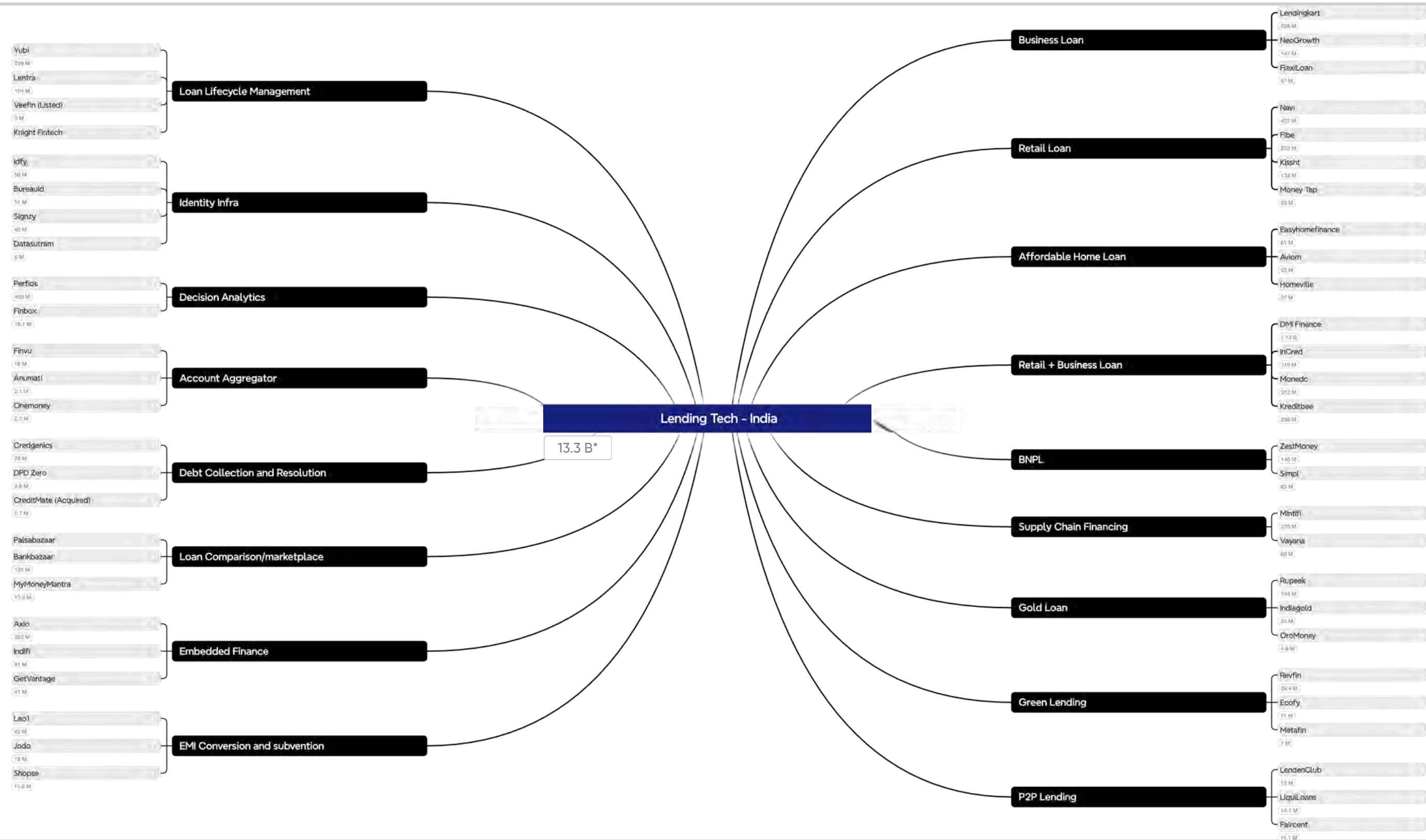
Many lenders are unaware of the benefits of joining industry associations like DLAI. We standardize processes, provide information access and awareness of government schemes like CGTMSE and CGFMU and help members navigate new regulatory requirements through expert consultations from top advisory firms and law firms.

We also work on standardizing co-lending documentation and are in the process of becoming a Self-Regulatory Organization (SRO). Even without SRO status, we foster collaboration among members to share knowledge and best practices. Organizations like SIDBI have been instrumental in helping us develop these standardized practices, which we continuously improve through discussions with industry experts and consultants.

Global Mindmap

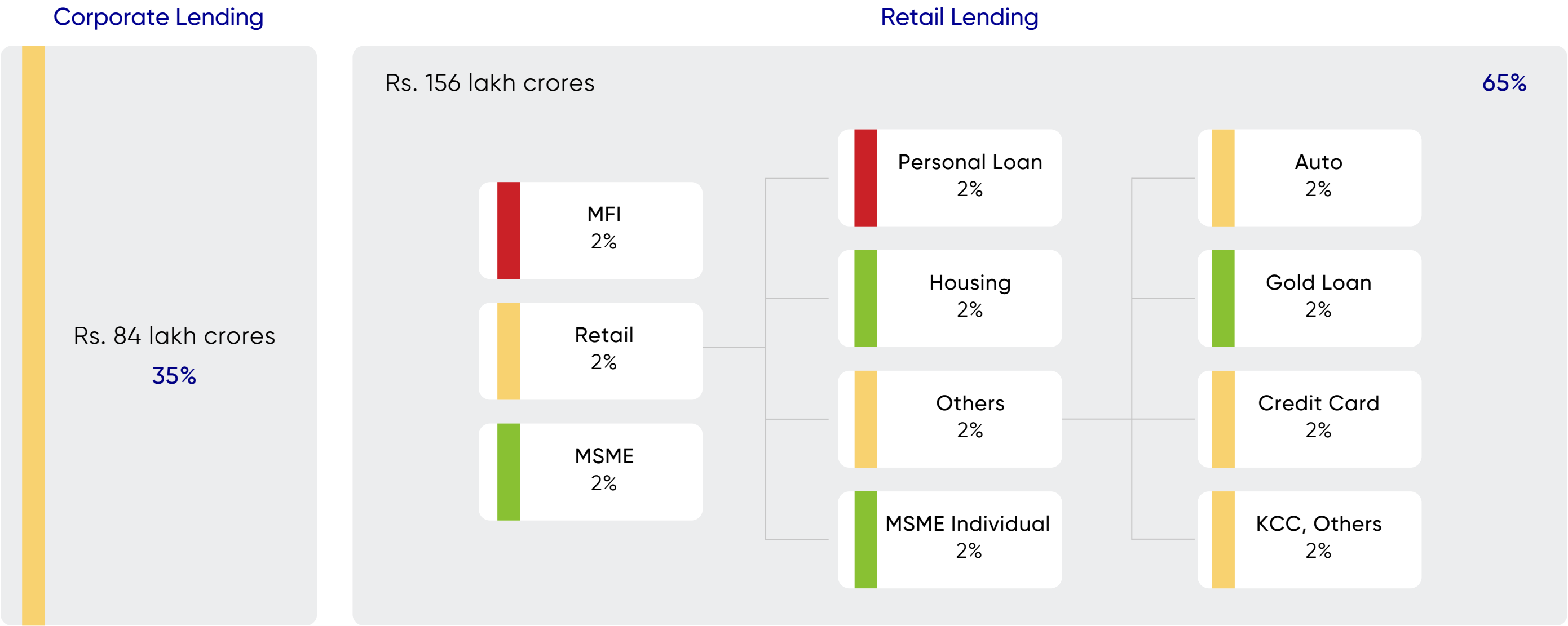


India Mindmap



* Funding Period from 2015 - 2024
Source: Tracxn, Varanium Research

Current Segmented Distribution of Indian Credit Market

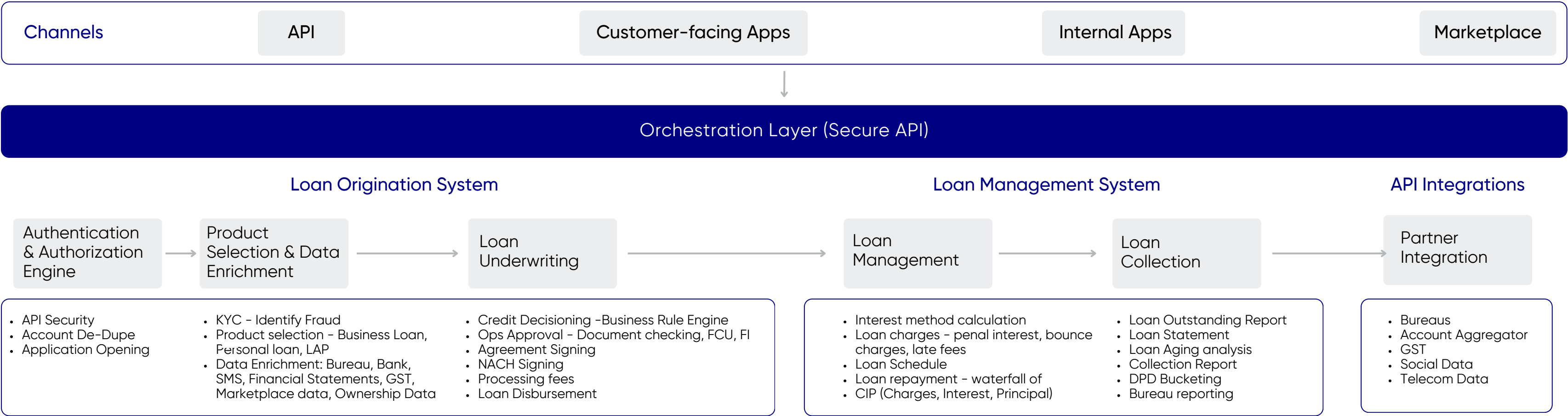


The coloured lines represent if there are any regulatory challenges or stress in the respective segments.

Functional Flow



Break down services into components to reduce risk and increase flexibility



The lending functional flow diagram presented illustrates a comprehensive and modular approach to digital lending platforms, designed to reduce risk and increase flexibility. At the top level, the system interfaces with various channels including APIs, customer-facing apps, internal apps, and marketplaces, all of which interact through a secure API orchestration layer.

The core of the system is divided into three main components: the Loan Origination System, Loan Management System, and API Integrations. The Loan Origination System begins with an Authentication & Authorization Engine, which likely employs robust security protocols and KYC (Know Your Customer) measures to prevent fraud and ensure regulatory compliance. This is followed by a Product Selection & Data Enrichment module, which leverages various data sources including bureau data, bank statements, and alternative data to offer tailored product recommendations and enhance the loan application with relevant information.

Functional Flow



The API Integrations component allows for seamless connection with various partners and service providers. This likely includes integration with credit bureaus, account aggregators, GST (Goods and Services Tax) systems, and potentially social media or telecom data sources for alternative credit scoring.

Underpinning the entire system is an Analytics & Reporting layer, which presumably provides real-time insights, regulatory reporting capabilities, and data-driven decision support tools for both operational and strategic purposes.

This modular architecture allows for flexibility in implementation and scaling, enabling fintech companies to adapt quickly to market demands and regulatory changes. The emphasis on data enrichment, advanced underwriting, and comprehensive loan management reflects the sophisticated approach modern lending platforms are taking to balance risk management with customer experience and operational efficiency.

Case Study



Bharat Housing Network is a platform of Homeville Group, a company building credit platforms and infrastructure to enable the flow of capital into credit assets linked to housing. BHN is focused on strengthening the entire Indian affordable housing finance sector.

Problem Statement

- **Technology:**
Total cost of ownership is high for a regional player, where keeping up to pace with the constantly evolving requirements becomes a challenge.
- **Limited capital:**
Regional affordable housing finance companies are dependent on banks & large NBFCs for capital restricting their growth
- **High opex:**
High operating cost for large lending companies in the sector

Solution

- Bharat Housing Network provides capital, integrated technology stack and infrastructure for Financial Institutions with modern lending & payment systems
- BHN is an API driven, cloud native platform leveraging data sciences and generative AI to strengthen underwriting in affordable housing

Impact

On regional HFCS & NBFCs

- 2-3x market expansion with ability to offer competitive interest rates
- Significant ROE expansion with higher yields and technology improving overall efficiency
- Improved ALM management

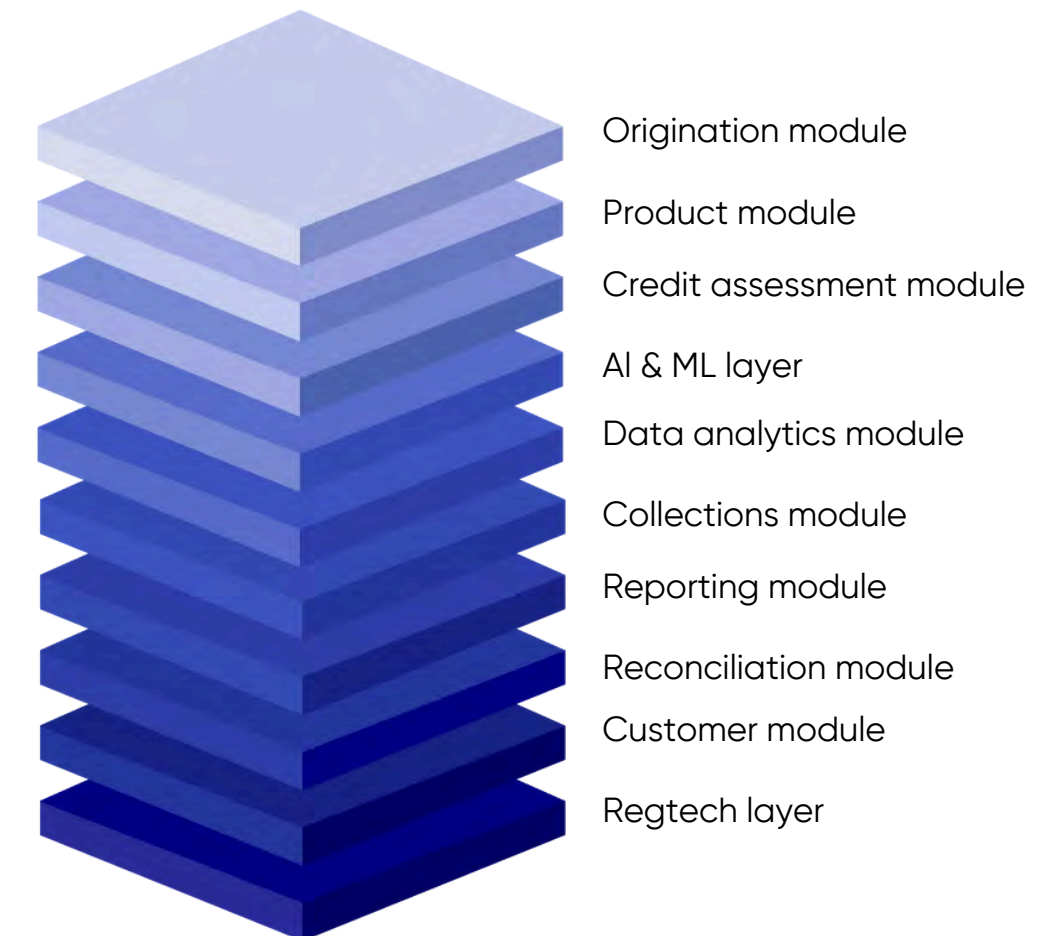
On large financial institutions

- Significant reduction in opex for capital deployment in the sector
- Middleware for end to end lending management (co-lending) resulting in fast go-lives with partners

On borrowers

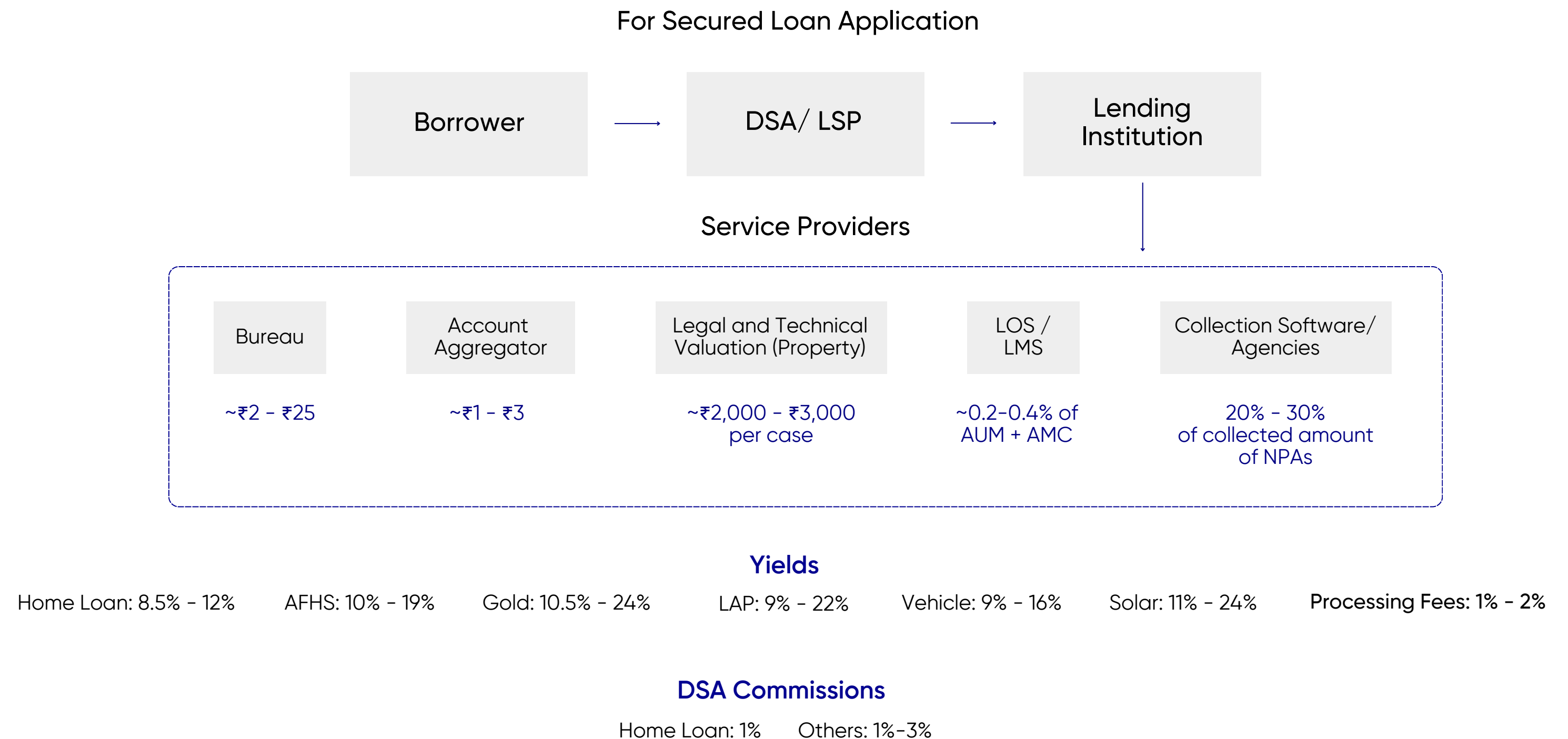
- Competitive pricing

BHN tech stack features



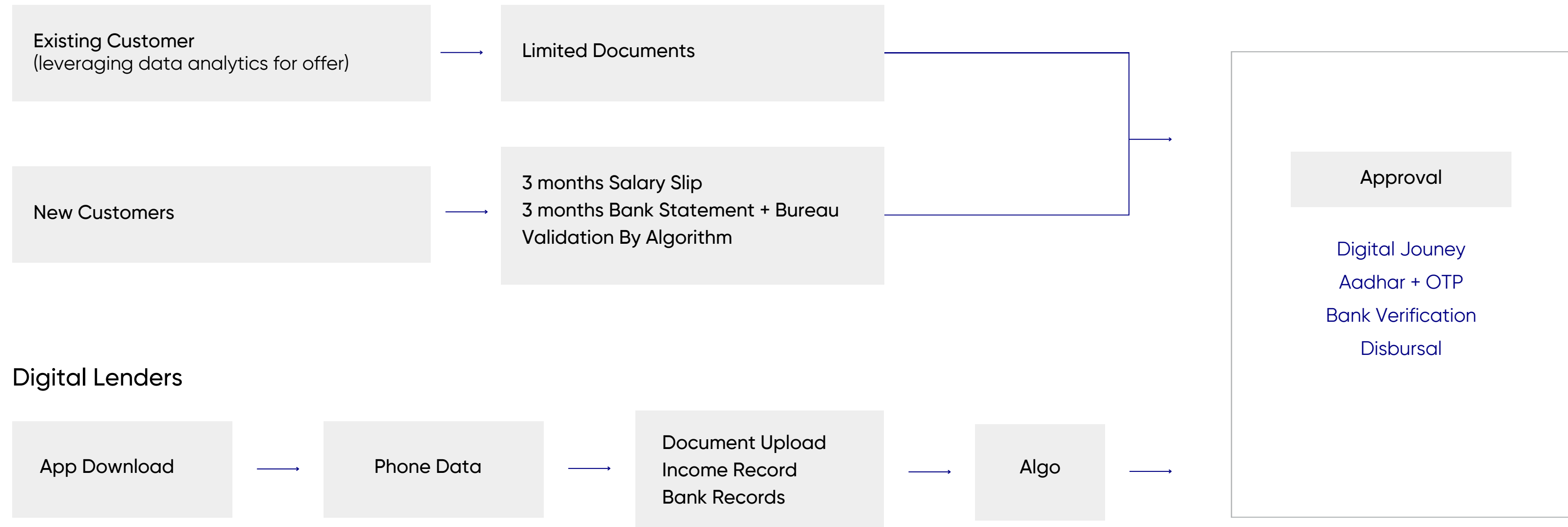
- API driven & cloud native platform
- Modern technology, payments infrastructure & trustee for efficient lending in the sector
- Leveraging AI for faster document processing

Value Chain Analysis

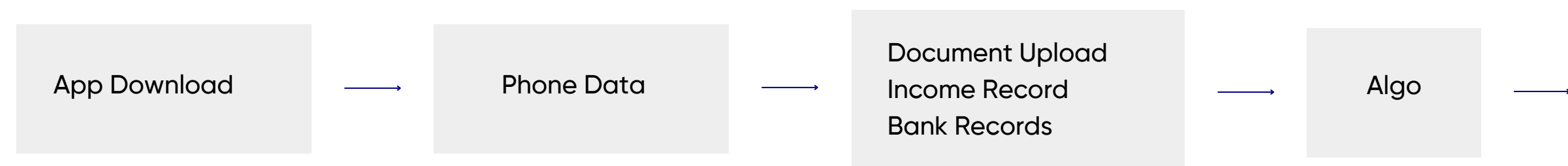


Value Chain Analysis: Unsecured

Traditional Lending Process



Digital Lenders



Traditional

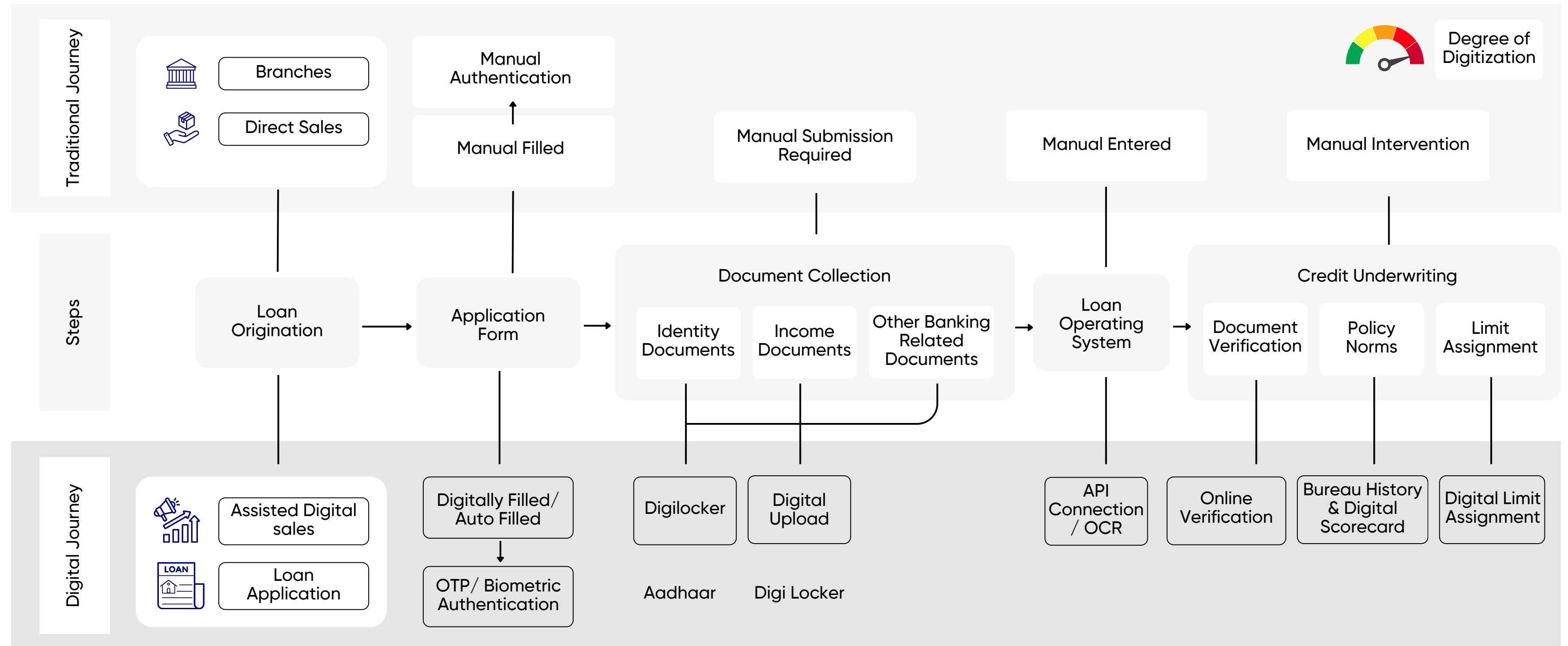
Yield: Bank: ~11-15% NBFCs: ~16- 22% Ticket Size: upto ₹ 1 Cr Processing Fee: 0.5 - 1%

Fintechs

Yield: ~24-60% Ticket size: ₹5,000 to ₹1,00,000 Processing Fee: upto 5%

Journey Flow: Comparision

Digital Lending Journey



Digitization in Secured Lending



Particulars	Processes/Tools	States Covered
<p>Digitization in Land Records</p> <p>The Digital India Land Records Modernization Programme (DILRMP), launched in 2008, aimed to create a transparent and efficient system for managing land records by digitizing Record of Rights (RoRs) and Cadastral Maps.</p>	<ul style="list-style-type: none">• Land Records Management System (LRMS): Centralized system for managing land records• DILRMP Platform: For managing and updating records, ensuring coordination between departments• Integration with Revenue and Registration Systems: Enables smooth sharing of information and streamlines record updates	<p>95% of RoRs computerized in 15 states/UTs 68% of cadastral maps digitized across 28 states</p> <p>Key States: Maharashtra, Karnataka, Gujarat, Punjab, Tamil Nadu, Uttar Pradesh, Telangana, Odisha, Madhya Pradesh, West Bengal, Andhra Pradesh, Bihar, Chhattisgarh, Haryana, Rajasthan</p>
<p>Digitization in Property Valuation</p> <p>Digitization has improved property valuation by leveraging market data, analysing factors like location, property type, and market trends.</p>	<ul style="list-style-type: none">• AVM Software Solutions (e.g., PropVal, Zillow API): Uses market data to generate property valuations• Real-time Market Analysis: Analyse price trends, historical sales data, and market fluctuations• Market Data Integration: Connects national property databases for comprehensive valuations	<p>90% of urban properties digitized for valuation in major cities</p> <p>Key States: Gujarat, Maharashtra, Karnataka, Tamil Nadu, Punjab, Rajasthan, Haryana, Delhi, Telangana, Andhra Pradesh, Uttar Pradesh</p>
<p>Digitization in Property Auctioning</p> <p>The evolution of digitization helped in property auctions, especially distressed asset sales.</p>	<ul style="list-style-type: none">• e-Auction Portal (e.g., e-Procurement Systems): Platform for transparent online auctions• Digital Bidding Platforms: Real-time bidding systems for secure transactions• Payment Integration Systems: Secure payment gateways integrated for seamless payments	<p>85% of property auctions in major cities conducted online</p> <p>Key States: Delhi, Karnataka, Maharashtra, Rajasthan, Gujarat, Tamil Nadu, Telangana, Uttar Pradesh, Andhra Pradesh, Punjab</p>

Digitization in Secured Lending

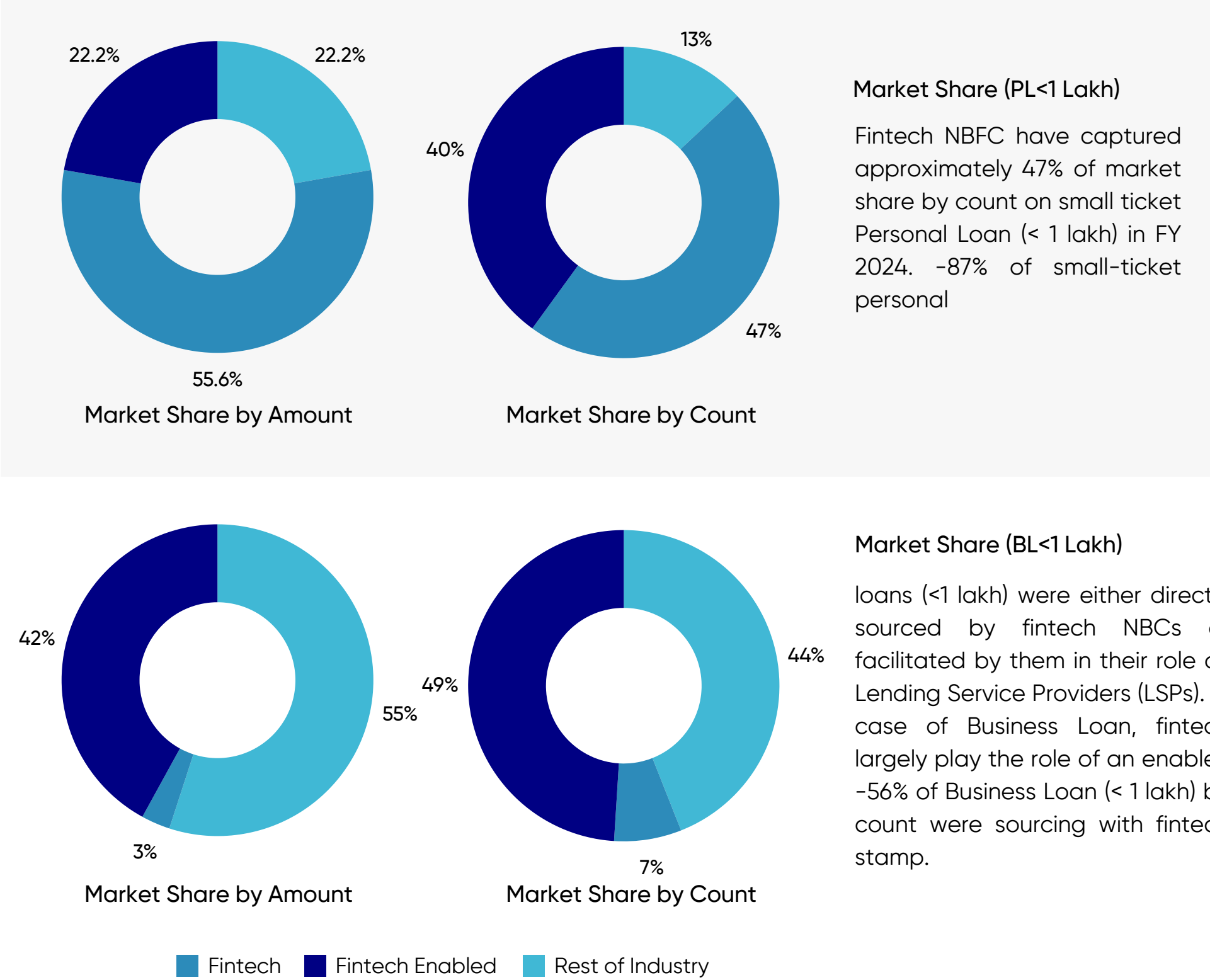


Particulars	Processes/Tools	States Covered
Digitization in Document Management	<ul style="list-style-type: none">Document Management Systems (DMS) (e.g., SharePoint, OpenText): Manage and organize digital property documentsOCR (Optical Character Recognition): Extracts data from scanned documents to automate summarizationAutomated Document Tagging: AI-driven categorization and retrieval of documents	<p>70% of property documents digitized in key urban centres</p> <p>Key States: Maharashtra, Delhi, Karnataka, Tamil Nadu, Gujarat, West Bengal, Uttar Pradesh, Andhra Pradesh, Telangana, Haryana</p>
<p>Digitization in Stamp Duty Payments</p> <p>Digitization has helped in improving tax compliance and tracking.</p>	<ul style="list-style-type: none">e-Payment Gateways (e.g., Paytm, Government e-Services): Allows for online payment of stamp dutiese-Stamping Platforms: Verifies and tracks payment of stamp duties for complianceIntegration with Revenue Collection Systems: Links tax and revenue systems for streamlined operations	<p>80% of stamp duty payments in major cities processed digitally</p> <p>Key States: Maharashtra, Karnataka, Delhi, Tamil Nadu, Gujarat, Uttar Pradesh, Andhra Pradesh, Telangana, Punjab, West Bengal</p>

Fintech In Lending



	As of March 24	Personal Loan	Business Loan
AUM Amount (in Cr)	Fintech NBFC	2,48,006	28,607
	Fintech Enabled	32,515	21,450
AUM # (in Lac)	Fintech NBFC	388	15
	Fintech Enabled	242	38
FY24 Disbursal Amount (in Cr)	Fintech NBFC	2,11,794	17,345
	Fintech Enabled	28,737	8,317
FY24 Disbursal Amount ('000)	Fintech NBFC	49,193	951
	Fintech Enabled	11,318	1,684
FY 24 Market Share Amount	Fintech NBFC	25%	21%
	Fintech Enabled	3%	10%
FY 24 Market Share Amount	Fintech NBFC	52%	16%
	Fintech Enabled	12%	18%
Net 90+%	Fintech NBFC	1.51%	1.28%
	Fintech Enabled	1.35	1.75%



Interview with Olyv



Rohit Garg

Co-Founder & CEO

What nuanced approach has Olyv (formerly known as SmartCoin) adopted for underwriting customers, and how have alternative credit scoring methods/alternate data enhanced your ability to assess and approve applicants compared to traditional methods?

Olyv's mission is to expand credit access for India's mass middle-income population, including Tier 2+ locations and self-employed customers. The challenge lies in underwriting thin-file customers with limited credit histories, as many have short-term credit exposure, like small-ticket loans for smartphones. Traditional bureau scores often aren't reliable enough to approve larger loans or credit cards.

To address this, Olyv combines bureau data with alternative data sources like financial SMSs, banking transactions, and digital behavioral footprints. Machine learning models are employed to analyze these diverse data points, allowing us to create a holistic view of the applicant's creditworthiness. This nuanced approach, supported by explainable AI, ensures accurate underwriting and expanded access to underserved segments.

Given the backdrop of low wage growth, rising joblessness, and increased consumer borrowing for consumption, we've seen a surge in personal lending, leading to a rise in NPAs and prompting regulatory interventions from the RBI. How do you see the future of the personal lending sector evolving, particularly in terms of the role of fintech lenders versus traditional banks, the impact of RBI's measures, and the overall credit risk environment?

India's personal lending sector is poised for long-term growth due to its significant demand-supply gap. Even compared to other developing countries, India has ample room to expand credit access. The growth trajectory may fluctuate, but financial services are central to India's goal of becoming a \$5 trillion economy.

RBI's regulatory interventions are a long-term positive for the sector, providing much-needed clarity on permissible activities and customer protections. Fintech lenders, with their digital-first models, are better positioned than traditional banks to harness data-driven underwriting and risk management strategies. Over time, the ecosystem will mature further, and prudent lenders focusing on sustainable growth and sound underwriting practices will thrive.

Interview with Olyv



How do you anticipate the regulatory impact of increased risk-weighted assets and the RBI's directive to slow down unsecured lending on the space as a whole? Are you witnessing a liquidity crunch in the space as a result of these regulatory changes?

The RBI's measures have successfully slowed the rapid growth seen post-COVID, bringing the sector's growth rates more in line with long-term sustainable trends. This normalization was necessary to prevent overextension.

We've seen a liquidity crunch, particularly on the equity side, as investors have become more cautious. Debt funding has also tightened, with banks scrutinizing operational metrics more rigorously before extending credit lines. However, companies with fundamentally sound business models and disciplined growth strategies are still able to secure funding. This environment is separating strong players from those overly focused on rapid expansion.

Given that very few companies globally like Capital One have scaled in the unsecured lending space, how do you see Olyv's journey, and are you planning to diversify offerings to drive growth?

Olyv's vision extends beyond lending to create a one-stop financial services platform for India's mass middle-income segment. In addition to credit products, we've already launched offerings related to savings, insurance, and financial management.

Cross-selling is a critical aspect of our strategy, leveraging customer data and multiple product touchpoints to provide personalized financial solutions. By diversifying our product suite, we not only drive growth but also enhance customer retention and engagement. Similar to successful global financial services companies, we believe that a diversified product portfolio is key to sustainable growth.

What are some of the biggest operational challenges Olyv has faced in scaling its services, and how have you addressed them?

As a digital-first startup, Olyv has faced relatively fewer operational challenges. However, one significant challenge has been managing collections across India's diverse geographies and customer profiles. Developing cost-effective and scalable collection models without overextending capital expenditures was key. We adopted a full-stack approach, segmenting customers based on their profiles and tailoring collection strategies accordingly. Digital channels were used for segments where it was feasible, while on-ground collection teams were deployed where necessary. Local partnerships helped us maintain cost efficiency, and this targeted strategy has enabled us to scale effectively while keeping operational expenses under control.

Interview with Olyv



How's the NPA shaping up in the industry, and what ROE and ROA can one expect with a credible book size?

The post-COVID boom led to an increase in NPAs across the industry, but prudent players have taken the necessary steps to manage risk effectively. Overall, NPAs are within acceptable ranges for most major players, with risk management practices improving across the board.

With a well-managed book and optimized cost structures, we can expect a steady state ROA of 4-6% and an ROE of 20-25%. These figures reflect the efficiency gains from digital operations and the benefits of scale. As the industry matures over the next five to six years, we expect these targets to be achievable consistently.

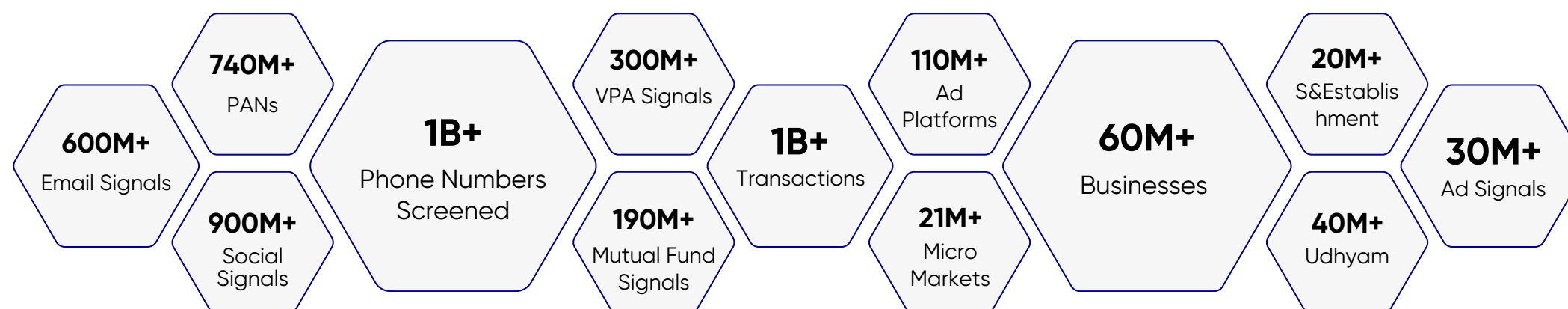
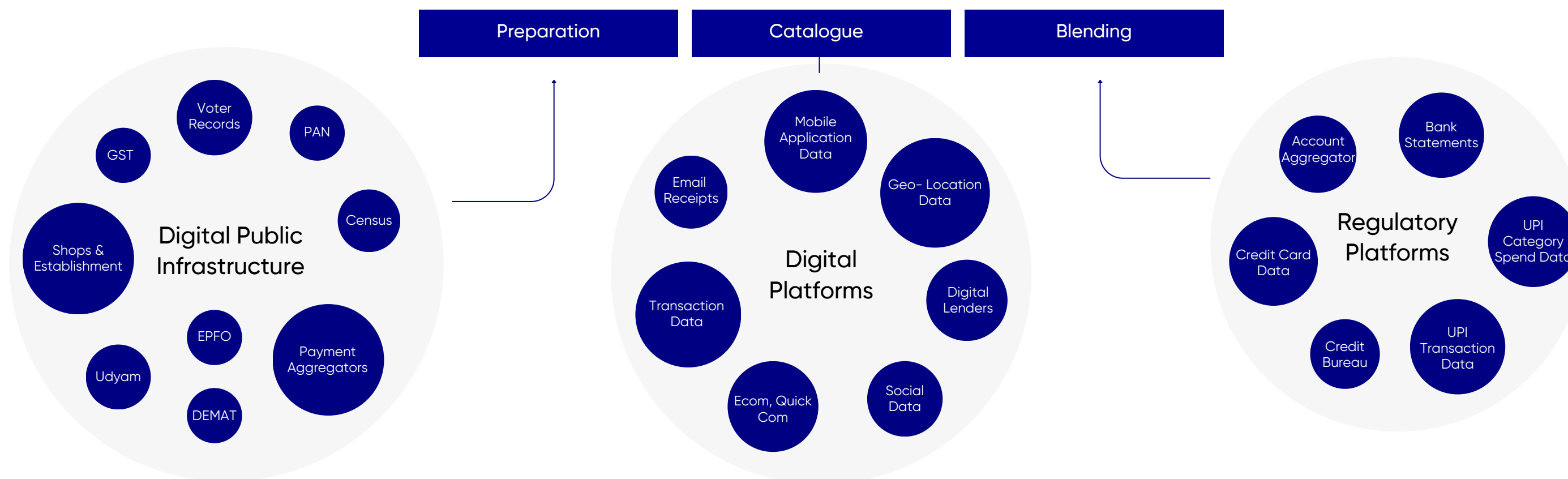
How is the funding environment, especially on the equity side? How has fundraising been across the sector?

Between 2020 and 2022, the sector experienced a robust funding cycle due to high growth rates and investor enthusiasm. However, with increased regulatory scrutiny and the market normalizing, fundraising has become more selective over the past couple of years.

Equity funding has been particularly tight, with investors prioritizing companies that demonstrate profitability and resilience. Debt funding, while relatively more accessible, is also subject to stricter due diligence. As companies adapt to the new regulatory environment and improve their operational metrics, I expect the funding cycle to turn more positive within the next one to two years.

Alternate Data

Emerging as the backbone for lending



Customer Acquisition

Planning Growth

- Qualifies Locations for Market Expansion
- Identify sales potential
- Plan Branches, Resources

Onboarding

Increasing Sales

- Qualifies Leads at the time of onboarding
- Identify earning potential
- Create product recommendations

Underwriting

Reducing Fraud

- Identifying application level triggers
- Risk Assessment at onboarding
- Early Warning Signals on Portfolio

Collections

Improving Recovery

- Prioritising Addresses for Collection
- Contact Poin Verification Waiver
- Skip Tracing (DPD >90)

Effectiveness of Alternate Data

The Fraud Case

Name: Sarla Agarwal
Phone: 673X XXXX33
Email: sarXXXXX@gmail.com
PAN: AKKPXXXXP
TrustScore: 340

Negative Flags:

- **High Location Volatility:** Multiple bank accounts in Regional Banks and cooperative banks are connected to the phone number.
- **No Professional History:** No Employment history found against pan (no connected UAN). Also, no GST/Udhyam was discovered.
- **Multiple IFSC:** Multiple Bank branches IFSC from multiple districts from a nearby region.

Discovery:

Thousands of low-value transactions at cyclic periodic intervals. Common repeated receiver bank accounts.

Conclusion: Suspected Mule Account

The Fraud Case

Name: Rohit Mehta
Phone: 897X XXXX32
Email: rockXXXXXXXXX@gmail.com
PAN: DCKPMXXXXW
TrustScore: 230

Negative Flags:

- **Name Mismatch as per Banking records:** The name provided at the application stage does not match the name connected to the phone number on the UPI Network.
- **Low Digital Vintage:** The provided phone number has been recycled multiple times in the past. Also, the same phone number is seen with multiple other names.
- **High Bank relation count:** Multiple bank accounts connected to the same Identity.

Discovery:

The phone number was a temporary one picked up for the sole purpose of defrauding Fls. The rest of the Identity was created by piecing together fragments of stolen personal information.

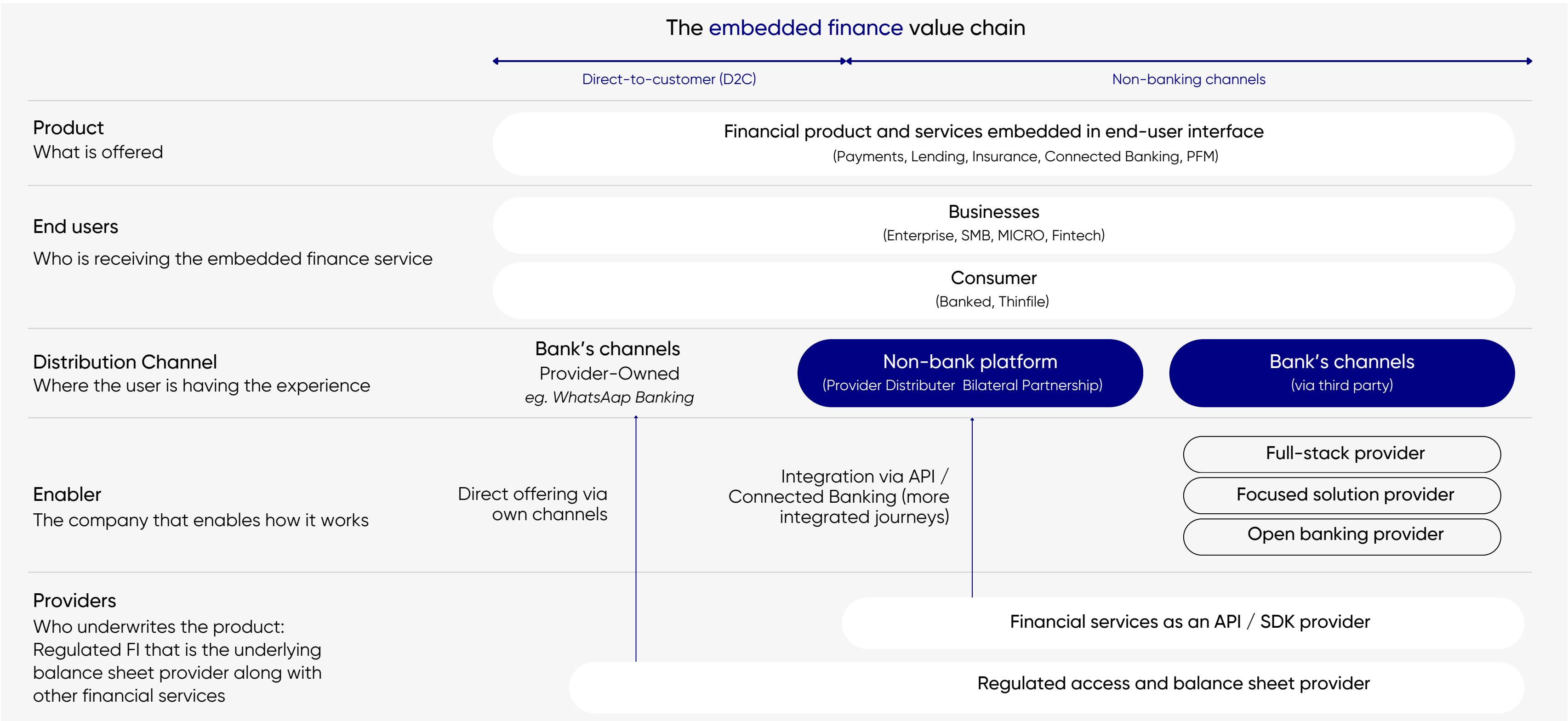
Conclusion: Probable Mule Account

Conclusion:

Use of various signals like name miss match across records, e mail signals, social signals, VPA Signals etc helps banks and other establishments avoid onboarding fraudulent customers



Embed Finance



Case Study



GetVantage

GetVantage is an embedded finance fintech that offers fast and flexible financing solutions to micro, small, and medium-sized enterprises (SMEs). Powered by GetGrowth Capital, its own RBI-licensed NBFC, it offers a single integration point to multiple regulated entities (lenders).

Over ₹900 Crores

Funded & financed across 18+ SME sectors

Problem Statement

Borrower agents seeking to integrate lenders into their platforms faced a multitude of challenges. The financing landscape was complex, presenting several significant hurdles:

- High Cost of Short-Term Lending: Cost per loan has been the primary deterrent for lenders to add short-term lending in their portfolios.
- Diverse Product Offerings: Agents struggled to incorporate multiple lenders offering various financial products, including short-term working capital, invoice financing, vendor financing, and term loans.
- Fragmented Lending Ecosystem: Each lender operated with unique processes, compliance requirements, credit policies, and operational procedures, creating a disjointed and complex system.
- Inefficient Application Processes: Borrowers were required to submit separate applications for each lender on the platform, resulting in a time-consuming and repetitive process.
- Elevated Compliance Costs: Managing multiple vendors increased cybersecurity risks and necessitated robust vendor risk management. Ensuring 100% compliance with regulatory requirements for each lender added another layer of complexity and cost.
- Increased Operational Expenses: Agents had to manually manage relationships with multiple lenders, track various application statuses, and maintain multiple integrations, leading to higher operational costs.
- Lender-Specific Criteria: Some lenders had specific preferences, only offering loans in certain sectors or geographical areas (pincodes), further complicating the matching process.
- Inconsistent Customer Experience: Borrowers often encountered varying experiences with different lenders on the platform, resulting in an inconsistent and potentially confusing user journey.

These challenges collectively hindered the efficiency and effectiveness of borrower agents' platforms, calling for a more streamlined and integrated solution.

Solution

GetVantage developed an embedded lending platform* that addressed these challenges by providing a single integration point connecting multiple regulated entities.

- Unified Application Process: Borrowers could apply once and be considered by multiple lenders simultaneously.
- Customizable Lending Products: Lenders could easily configure their products and eligibility criteria on the platform.
- Intelligent Matching Algorithm: The platform used advanced algorithms to match borrowers with the most suitable lenders based on their profiles and lender criteria.
- Full Process Management: Covers onboarding, disbursement, and monitoring, with multiple scorecards for quicker evaluations across sectors.

*Click on the underlined text for the video

Case Study



- Efficient Collection Process: High frequency and collectively digital / auto-repayments reduce risk exponentially. Collections Control with virtual Escrow a/c and also with integrations with marketplaces and Payment aggregators they are able to recover the money on a daily/weekly basis.

Furthermore, innovations like the Open Credit Enablement Network (OCEN) have revolutionized access to credit by standardizing protocols and facilitating real-time data exchange between lenders and platforms. This infrastructure, combined with AI's role in building accurate borrower profiles and automating credit assessments, ensures quicker and more reliable financing for small businesses.

Implementation and Results:

Looking beyond AUM: While AUM has traditionally been the key metric for lenders, it may not fully reflect the opportunity within short-term lending. New metrics such as Total Disbursement and Total Income, are key to understanding the potential of tech driven, low- OPEX lending for MSMEs.

Increased Efficiency:

- Application processing time reduced by 70%
- Agents could manage 3x more loan applications in the same time

Improved Access to Credit:

- 40% increase in loan approval rates
- 25% increase in the number of first-time borrowers served

Cost Reduction:

- Operational costs for agents decreased by 50%
- Lenders reported a 30% reduction in customer acquisition costs

Enhanced Transparency:

- 85% of borrowers reported better understanding of loan terms
- Complaints of hidden charges decreased by 80%

Expanded Market Reach:

- Lenders could reach previously underserved segments
- 35% increase in Tier2 & rural lending

Regulatory Compliance:

- 100% compliance with regulatory requirements
- Reduced audit-related issues for lenders by 60%

Improved Customer Satisfaction:

- Net Promoter Score (NPS) for the lending process improved by 40 points

By leveraging the transformative power of embedded finance, AI, and OCEN, GetVantage has helped borrower agents overcome complex challenges, streamline their processes, and expand access to capital for SMEs, making financing faster, more transparent, and more inclusive.

Emerging Trends: ESG Lending



Parameters	Solar Financing	EV Financing
Popular Business Models	Direct Lending, Power Purchase Agreements, Individuals investing in clean and green assets through SPV	Leasing of fleets, Lending
Benefits Brought in Ecosystem	Grid Cost: 8-16 per unit (comprises of variable and cess)* not considering diesel genset to generate electricity	Operating cost of ICE : INR 4 per km
	Solar Cost: 4-7 per unit depending upon the size of the plant (commercial) subject to regulations	Operating cost of EV : INR 1.5 per km
Lifecycle of Asset	20-25 years	Battery Replacement: Cars: 6 years, 2-wheelers: 36 months, E-rickshaw: 18 months, 3-wheelers – 48 months
Risks and Challenges	Regulatory Risk: State-wise solar policies, permissions for net metering, etc	
	Dependence upon subsidies in residential projects <ul style="list-style-type: none"> • Project Implementation risk (quality of installation) • We intend to see a rise in competition as MFIs and secured lenders are also entering the space 	<ul style="list-style-type: none"> • Very high competition and very high LTVs being offered on EV financing, • Pressure on margins and in long run there'll be no differentiation between EV financiers and regular vehicle financiers.
Subsidies offered	Primarily on-grid projects, only on Residential Rooftop solar,	FAME II subsidy has been phased out and PM subsidy for EV vehicle has been introduced (PM E-Drive Scheme)
Underwriting and Monitoring	Ongoing Monitoring and maintenance of plant health leads to better risk management, Remote Kill Switch	IOT devices to check health of battery and kms covered, signaling repairs and maintenance, GPS Monitoring
Notable Companies	Metafin, Aerem, Pyse, Cleanmax, Anplus, Sustvest	Ecofy, Revfin, Everest Fleet, OTO Capital, Mufin, Alt Mobility, Greaves Finance
Impact Created	Co2 reversal, unlike EV which uses thermal energy to charge batteries – solar reduces greenhouse gas emission	Co2 reversal

Source: Industry Experts, Varanium Research

Emerging Trends: ESG Lending



Parameters	Solar Financing	EV Financing
Lending Economics		
Cost of Acquisition	0.5-1.5%	1-2% (higher due to dealer partnerships / competing players)
Lending Cost	14-24 % for MSMEs, 9-14% residential rooftops	14-27%
Cost of Opex	3-5% on a stable book	7-8%
Credit Cost	Still early	3-5%
Cost of Tech	0.5-1.5%	NA
Other Major Income	Carbon Credits (where additionality criteria are met), Insurance Income, Maintenance Income	Secondary vehicle sales, Insurance, Repair/Maintenance
Top-up loan facility	Generally not available	Yes

Green Bonds and recent launch Green Deposit framework will accelerate funding and drive sustainable growth in the ESG sector.



Insurance

Interview with Sarbvir Singh



Sarbvir Singh

CEO Policy Bazaar

Speaking of insurance, there's a lot of talk about the mis-selling of insurance policies. How does Policy Bazaar address this issue?

Mis-selling is a significant concern, especially in traditional insurance products like participating plans. At Policy Bazaar, our focus is on protection products such as health insurance and term insurance, where the risk of mis-selling is lower due to the straightforward nature of these products. We do not sell participating products because they are often associated with higher potential for mis-selling. Instead, we focus on transparency and customer education to ensure that our clients fully understand the products they are purchasing.

That's reassuring. How does Policy Bazaar handle claims management to improve customer experience?

We place a strong emphasis on claims management, as this is a critical aspect of customer satisfaction. We focus on ensuring that all declarations are accurate at the time of sale to prevent issues later on. For health insurance, we conduct a verification process where a representative confirms the customer's declarations, reducing the chances of disputes during claims. If a claim is made, we go to great lengths to support our customers, even taking up their case with the insurance company if needed.

What about cases where the policy nominee is not as capable of handling claims, such as elderly parents? How does Policy Bazaar support them?

Education and information sharing are key. We encourage policyholders to ensure their nominees are fully aware of the policy details. For instance, during the COVID-19 pandemic, we had a case where a young child discovered that his father had a term insurance policy through an SMS reminder. We were able to assist them in successfully claiming the policy. It's crucial that nominees are informed to facilitate a smooth claims process.

As competition in the insurance aggregation space increases, how does Policy Bazaar plan to maintain its competitive edge?

Our strategy is to remain focused on being the best in insurance. We are insurance specialists and do not diversify into other areas. This allows us to continuously improve our offerings and customer experience. We also work closely with insurance companies to develop new and better products based on customer feedback. By staying true to our mission and focusing on what we do best, we believe we can maintain our competitive edge.

Interview with Sarbvir Singh



With the growing trend of point-of-sale insurance, how does Policy Bazaar address the issue of reducing margins due to competitive pressures?

Point-of-sale insurance is a different business model that focuses on products with low customer utility but high distributor margins. At Policy Bazaar, our focus is on products with high customer utility, where the claims ratio is much higher. We believe in providing value to our customers, and that's where our focus remains. We are not involved in the low-utility, high-margin products that are typically associated with point-of-sale insurance.

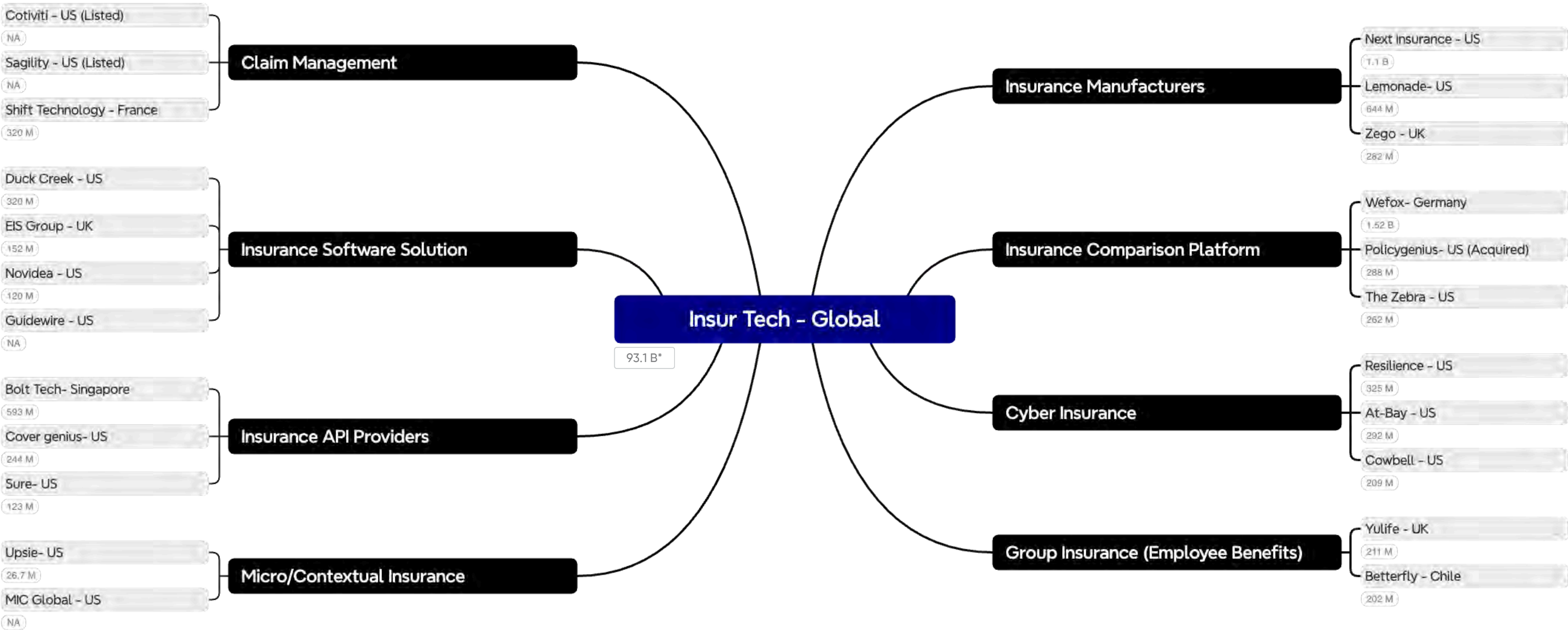
Customers often express concerns about receiving too many calls after using your platform. How do you balance customer service with the need to make sales?

It's a delicate balance. Insurance is a product that people don't often buy on their own initiative, so when someone shows interest by submitting their details, it's a significant step. We try to assist them in completing the purchase, but we are mindful of not overwhelming them. We are working on using technology to better segment our customers and tailor our approach based on their preferences, whether they prefer more support or less frequent contact.

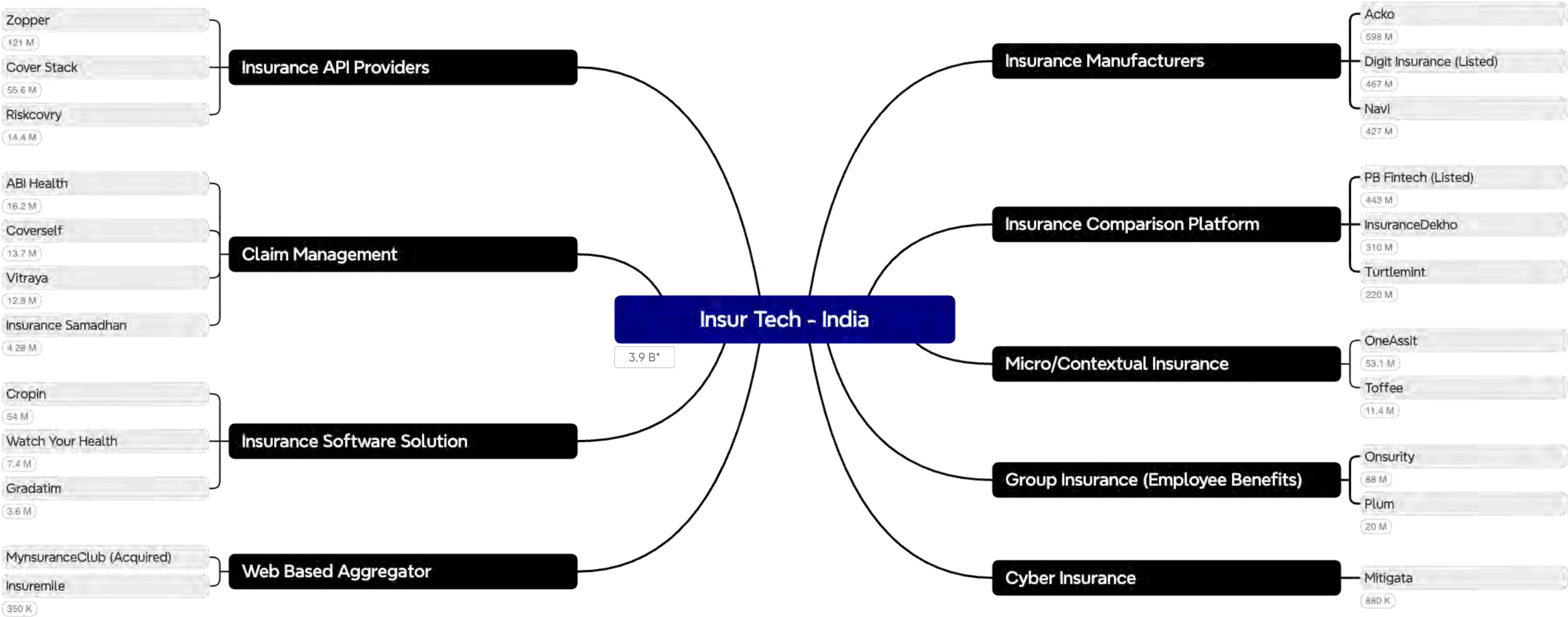
Lastly, where do you see the insurance industry evolving in the next 5 to 10 years, especially with innovations in product development and regulatory changes?

The insurance industry is poised for significant growth, especially with the progressive stance of the current IRDA chairman. The focus is shifting from just regulation to also fostering development, with ambitious goals like ensuring that all Indians are insured by 2047. Innovations in digital infrastructure, similar to what UPI did for financial services, will play a crucial role. The industry needs to work on increasing awareness, especially for products like term insurance, which are underutilized despite being highly affordable. With the right push, we can significantly increase insurance penetration in India.

Global Mindmap



India Mindmap



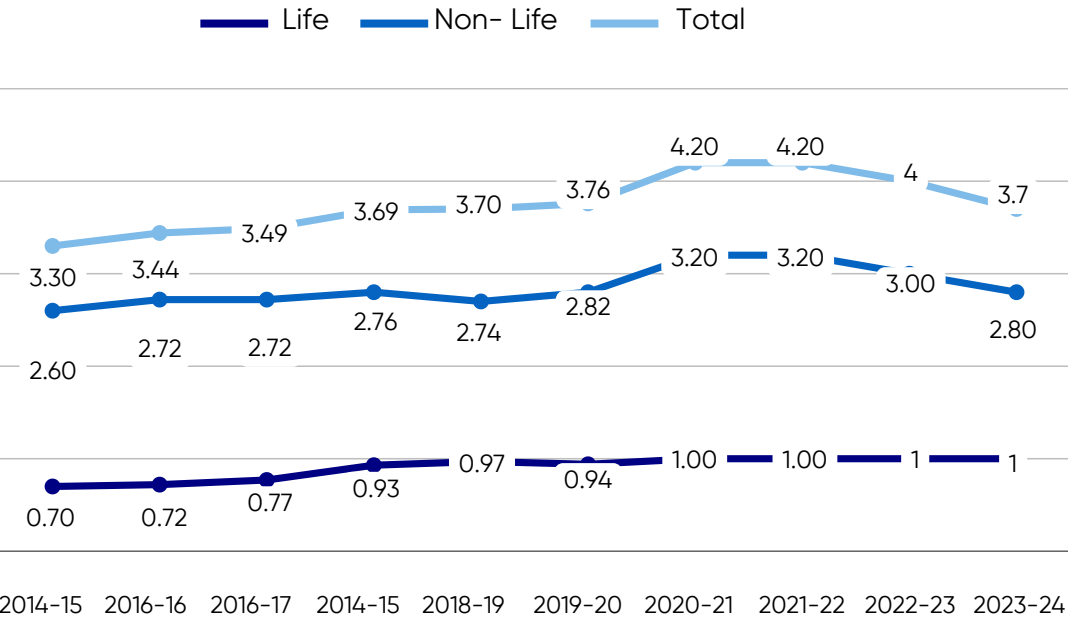
* Funding Period from 2015 - 2024
Source: Tracxn, Varanium Research

Insurance Penetration by Geography

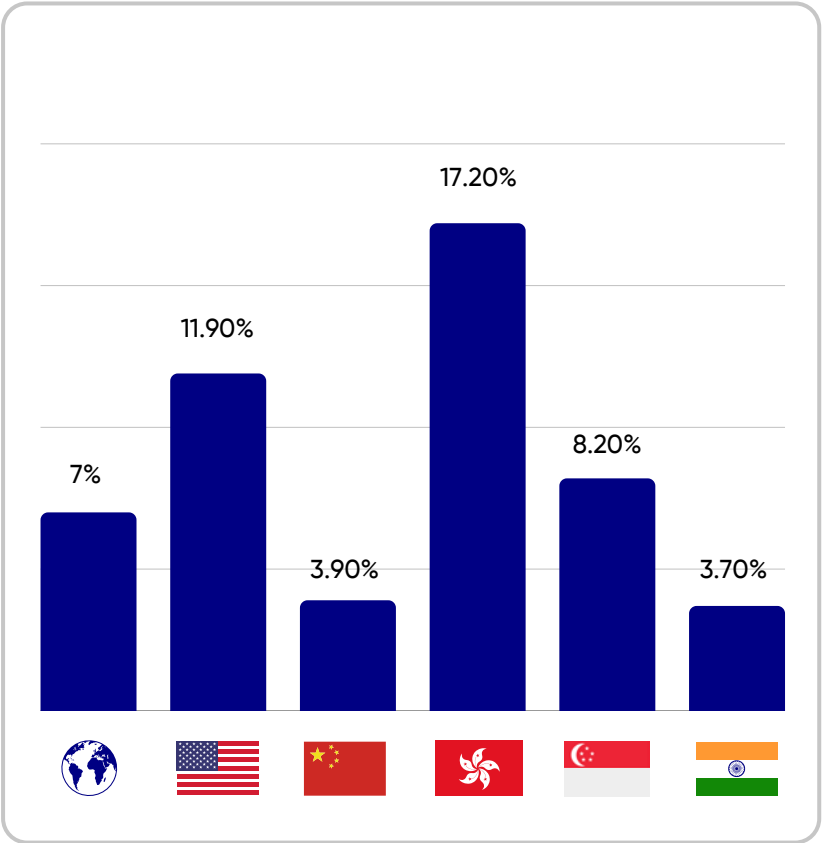


Rank	Market	Total premium volumes (USD bn)			Global market share	
		2023	2022	% change	2023	2022
1	United States	3227	2988	8.0%	44.9%	44.1%
2	China	724	698	3.7%	10.1%	10.3%
3	United Kingdom	375	337	11.3%	5.2%	5.0%
10	India	136	130	4.8%	1.9%	1.9%
	World	7186	6773	6.1%		

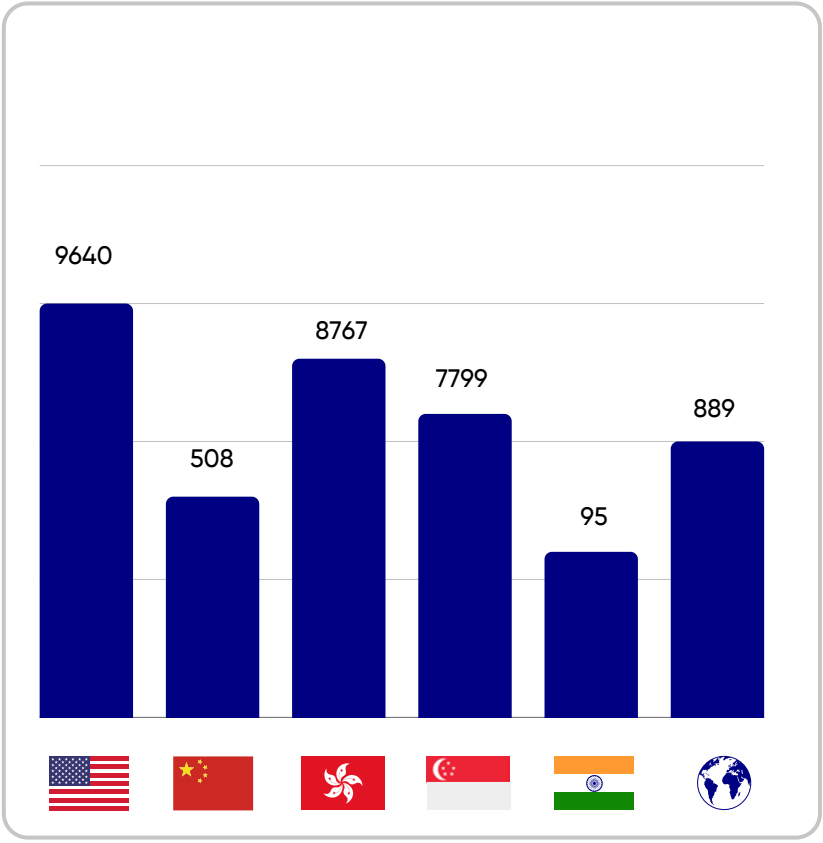
Insurance Penetration in India



Premium % of GDP



Insurance Density: Premium per capita in USD in 2023



Over the next five years (2024–28), we forecast that total insurance premiums will grow by 7.1% in real terms, well above the global (2.4%), emerging (5.1%) and advanced (1.7%) market averages. At this rate, India will have the fastest growing insurance sector of the G20 countries.

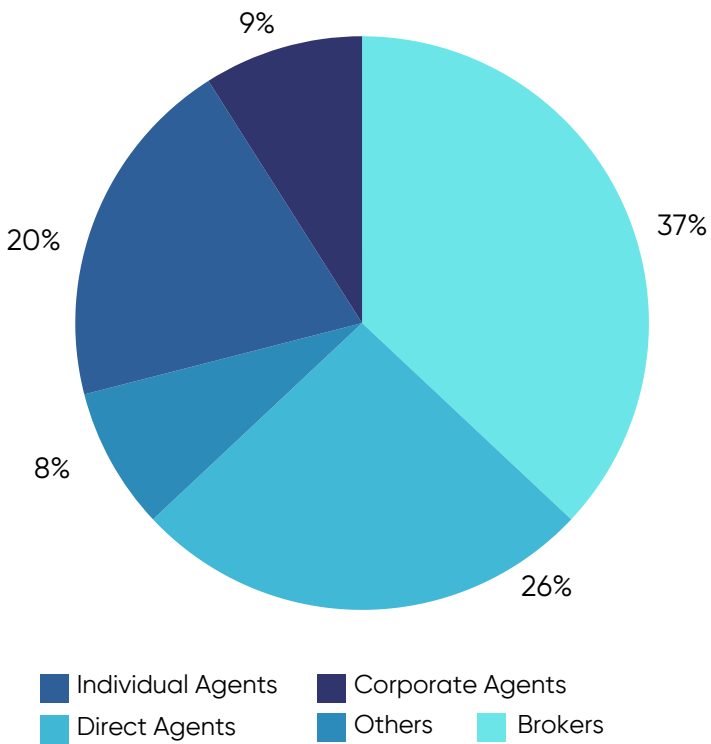
Insurance Distribution Landscape



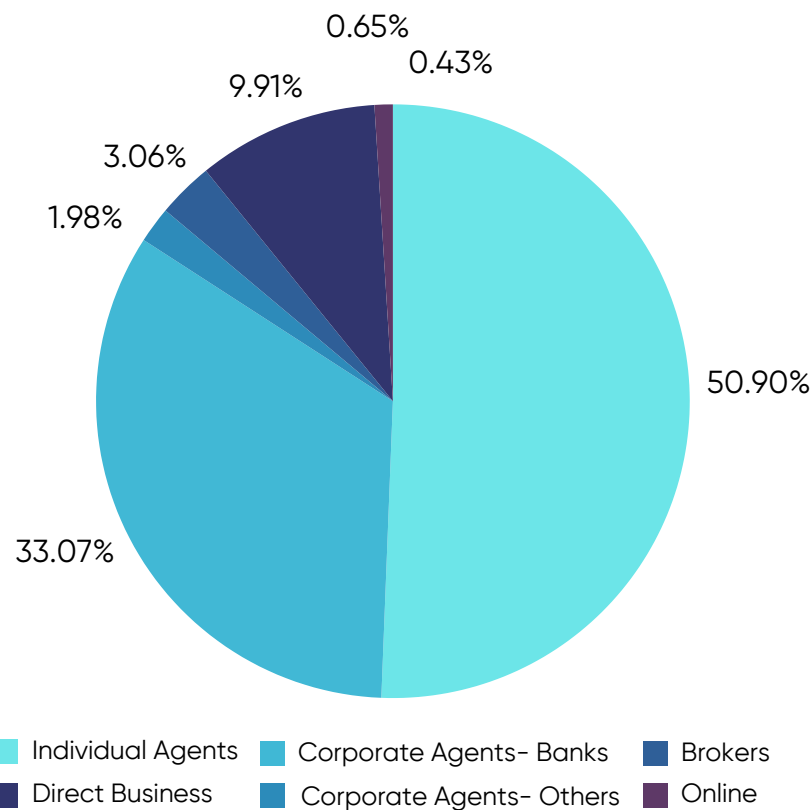
The Insurance Distribution Force



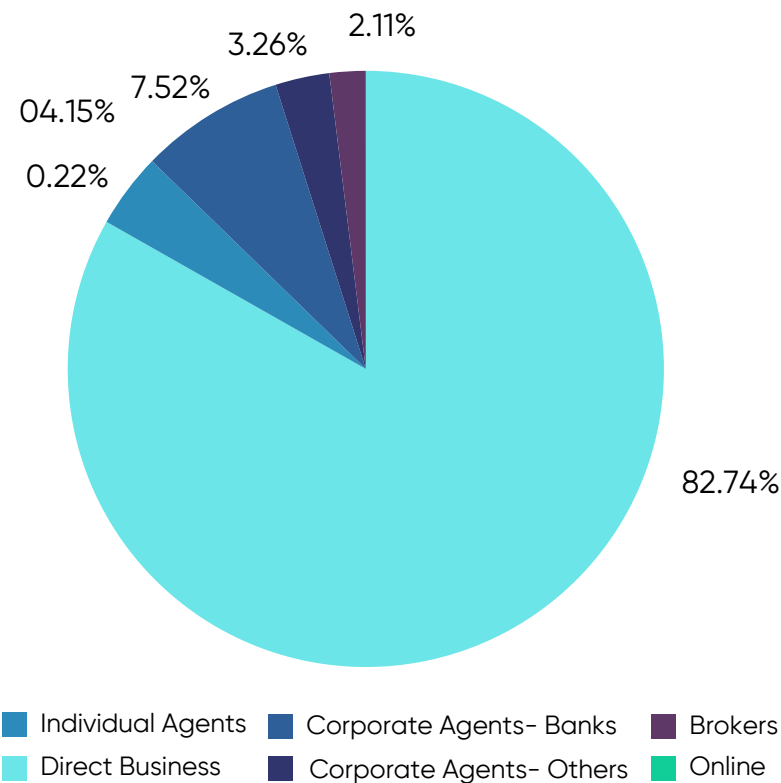
Contribution of Insurance Agents and Intermediaries In General Insurance Business (2023-24)



Individual Life Insurance Sales (New Business Premium) by Channel (2023-24)



Group Life Insurance Sales (New Business Premium) by Channel (2023-24)



Source: IRDAI Annual Report

IRDAI Eases Regulation, Boosting Penetration

01

Regulatory Architecture Review

- Regulatory framework assessed for agility & relevance
- Streamlining of regulations and circulars
- Sunset clause for regular reviews

02

Ease of Doing Business

- Simplified entry and exit processes
- Streamlined approvals
- Facilitation cell and online NOC portal introduced

03

Use and File Procedure

- Simplified entry and exit processes
- From “file and use” to “use without prior approval” through “use and file”

04

Operational Flexibility

- Flexible expense management
- Increased avenues for investments
- Solvency requirements have been normalised

Walking the Last Mile

- Formulation of the State Insurance Plans and formation of State and District Level Insurance Committees
- RUSO obligations redefined

05

Improved Distribution Efficiency

- Permissible limits increased
- No. of tie-ups permissible for corporate agents and insurance marketing firms (IMFs) have been tripled.

06

Tech Lead Innovation

- Regulatory sandbox updated with 24/7 access allowing experimentation of innovations for up to 36 months
- Bima Trinity conceptualised

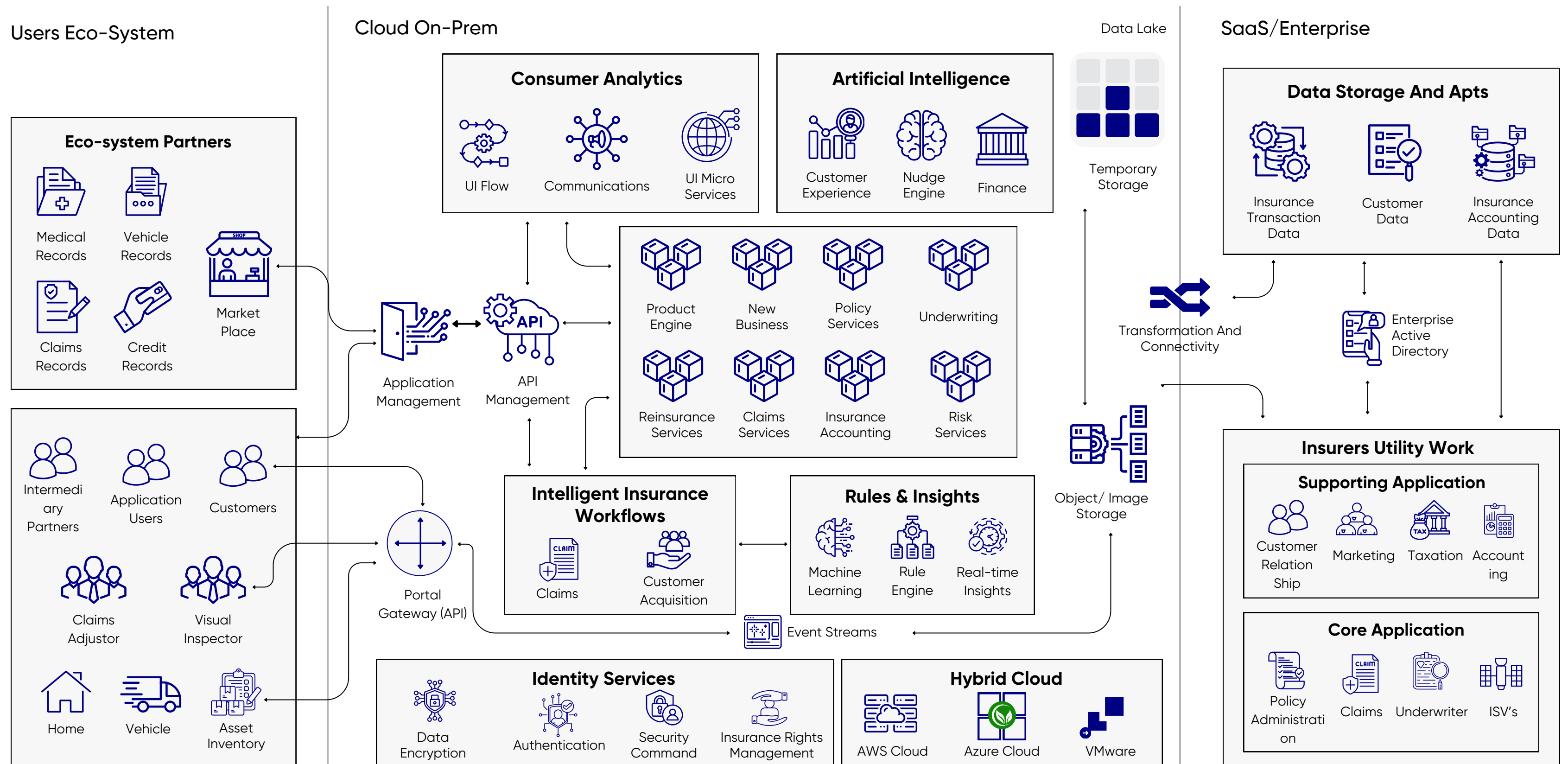
07

Policy Holder Interest

- Strict deadlines to streamline the claims settlement process
- Penalty of rs. 5000 per day for delays in complying with insurance ombudsman award

08

Tech Architecture



Different Types of Insurance Models



Takaful is a type of Islamic insurance wherein members contribute money into a pool system to guarantee each other against loss or damage. It is governed by Islamic religious rules. It covers life, health and general policies. It is different from traditional insurance as it goes against the Islamic restrictions of interest (riba), gambling and excessive uncertainty (gharar).

All parties or policyholders in a takaful arrangement agree to guarantee each other and make contributions to a pool or mutual fund instead of paying premiums. The pool of collected contributions creates the takaful fund. Each participant's contribution is based on the type of coverage they require and their personal circumstances. Takaful operator then manages the money, costs and investments for a predefined salary/fee. There are three major types of business model i.e. Mudaraba Model, Wakalah Model and Waqf Model.

Benefits



Ethical Investments

Funds are only invested in Sharia-compliant ventures, promoting ethical financial practices.



Non-Dilutive Financing

Funds are only invested in Sharia-compliant ventures, promoting ethical financial practices.



Financial Security

It provides financial protection against unforeseen events while adhering to Islamic principles.



Community Support

Takaful fosters a sense of community and mutual assistance among participants.

Challenges



Awareness and Understanding

It provides financial protection against unforeseen events while adhering to Islamic principles.



Regulatory Framework

The need for clear regulations can pose challenges for operators trying to establish compliant practices.

Surety Bonds



India:



Global:



Platforms providing technology to help underwrite and streamline insurance in India

Benefits



Ethical Investments

Surety bonds offer flexibility in financing options for businesses, allowing them to pursue larger projects without the constraints of traditional collateral requirements.



Dispute Resolution

Surety bonds provide a framework for resolving disputes between the principal and the obligee. The surety can mediate issues, ensuring that projects continue smoothly without significant delays.



Cost effective Solution

Compared to traditional financing methods like letters of credit, surety bonds are often more cost-effective. They typically do not require large sums of money to be tied up as collateral, allowing businesses to allocate resources more efficiently.

Challenges



Market Awareness

Despite its benefits, surety bonds are less recognized than bank guarantees in India. Increasing awareness and understanding among potential clients remains a challenge.



Competition

New age player faces competition from traditional banks and other financial institutions that offer similar products, which may have established relationships with contractors and project owners.



Regulatory Compliance

Navigating the regulatory landscape surrounding surety bonds can be complex, requiring ongoing updates and compliance with guidelines set by authorities like the Insurance Regulatory and Development Authority of India (IRDAI).

Health Subscriptions Models

Global:

Clover Health | *VitalityHealth*

Health subscription models are monthly or annual prepaid plans that offer healthcare benefits such as doctor consultations, diagnostic tests, medicine discounts, OPD and hospitalisation benefits and also sometimes limited insurance coverage. They work like Netflix or Amazon Prime for healthcare—providing continuous access to medical services at a fixed cost instead of paying per visit.

The platform aims to provide integrated health management solution by combining Insurance and wellness benefits for individuals.

Benefits



Affordability

Lower monthly subscriptions make healthcare more accessible. Further the platforms also provide an option of small deductibles in the insurance product to reduce overall premiums. Deductible is the small amount the insured has to pay from pocket towards treatments covered in the plan before insurance start to pay.



Comprehensive Coverage

Provides a wider coverage by covering hospitalisation, OPD, dental and mental health services, doctor consultations etc.



Personalization

Tailored plans ensure that users receive recommendations that suit their specific health conditions and lifestyle preferences.

Challenges



High Customer Acquisition cost



User Engagement and retention

Maintaining user engagement over time is crucial for the success of subscription-based models. If users do not see immediate results or benefits, they may discontinue their subscriptions.



Tailend Risk

Since these platforms are not required to maintain solvency ratios or meet specific net worth requirements, the tail-end risk is higher, as the claims paid out could exceed the subscription revenue collected from users.

Insurance Premium Financing



India:



Global:



Platforms helping individuals and businesses to pay for insurance policies in EMIs instead of upfront lump-sum payments. They act as a bridge between insurance buyers, lenders (banks/NBFCs), and insurance providers, making insurance more affordable and accessible.

Premium financing is a game-changer for insurance agents, brokers, and platforms. It removes affordability barriers, increases conversions, boosts policy values, and ensures long-term customer retention.

Benefits



Digital Platform

Provides a fully digital process for applying for insurance premium financing. Customers can complete the application in under five minutes without the need for physical documentation.



Accessibility

Addresses budget constraints that often prevent individuals and businesses from obtaining adequate insurance coverage.



Penetration

Deeper Penetration of insurance products to individuals.

Challenges



Economic Sensitivity

In India, insurance is often seen as an expense rather than a form of protection. As a result, during economic downturns, people may be more inclined to default on insurance-related loans compared to other loan products. However, these loans are generally secured, and in the event of a default, the insurance company terminates the policies, seizes the premiums, and compensates the lender by paying the outstanding principal amount.



Pressure on Margins

With the entry of large player and more competition entering in the segment, margins may compress.



Operational Challenge

Given the small ticket size and short duration of the loan, managing acquisition costs and operational expenses for building a large book can be challenging.



WatchYourHealth leads in driving customer engagement within the healthcare ecosystem through its enterprise-level SaaS platform. The solution empowers insurance companies, pharmaceutical firms, hospitals, banks, and other healthcare/fintech stakeholders with personalized, data-driven engagement and wellness programs.

More than just a health tech company, it transforms the industry, making healthcare more engaging, personalized, and financially sustainable for all stakeholders.

Problem Statement

The platform focuses on enhancing customer engagement, which directly translates into long-term financial benefits. By utilizing advanced analytics, AI, and real-time data from touchpoints such as wearables, health assessments, and patient behavior, WatchYourHealth creates personalized health journeys. These journeys not only improve individual health outcomes but also strengthen the connection between users and service providers, enhancing loyalty, satisfaction, and retention.

For insurance companies, the platform helps boost persistency and cross-sell/upsell opportunities by offering value-added services tied to customer well-being. Pharmaceutical companies benefit from fostering long-term patient relationships through continuous health tracking and personalized care plans, improving medication adherence and outcomes. The financial benefits of healthier customers include fewer claims, reduced healthcare costs, and higher profitability. WatchYourHealth enables organizations to transition from reactive to proactive care models, delivering tangible ROI and improved health management.

Technical Solution

WatchYourHealth's enterprise-level SaaS platform enhances customer engagement and delivers financial benefits within the healthcare ecosystem. Through a customizable SDK, the platform integrates with existing systems, providing personalized health insights and wellness programs for insurance, pharmaceutical, and healthcare organizations. The platform aggregates data from wearables, health records, and user inputs, using AI-driven analytics to create personalized health journeys. These journeys include tailored wellness plans, fitness programs, and lifestyle recommendations that enhance engagement and retention. Behavioral science and gamification further motivate users, while AI-powered health scoring and risk prediction enable organizations to proactively address health risks, reducing long-term healthcare costs. The scalable, cloud-based platform supports omni-channel engagement across web, mobile, and voice assistants, while adhering to HIPAA and GDPR standards for security. Continuous learning from user feedback ensures the system stays relevant and impactful.

Impact

Insurance Value

10%	10%.	45%	30%	55%
improvement in life insurance persistency and 20% in health insurance.	Claim ratio reduced by 10%	increase in sales and cross-sell opportunities.	increase in doctor follow-up rates.	improvement in patient adherence.

- Results in enhanced customer engagement and long-term financial benefits.
- Pharmaceutical Value
- Strengthens patient relationships, improves health outcomes, and ensures medication adherence, delivering long-term benefits for patients and organizations alike.

Comparison



New Age Insurers	vs	Traditional Insurers
<ul style="list-style-type: none"> • New Age insurers Like ACKO have adopted either direct distribution through their website or app or through Embedded insurance distribution partners • However, Insurers like Godigit, Zuno have adopted the mixed distribution approach by offering direct digital as well as assisted digital • The new age insurers adopting only digital save on the costs related to physical branch setup, however they incur significantly high marketing costs to generate business • The new age lack the geographic presence and influencers to attract customers beyond genz and urban segments 	Distribution	<ul style="list-style-type: none"> • Uses all channels of distribution such as Brokers, Agents, Banks and digital which has helped them to establish a robust mix of business across individual and business-related insurance products. • The cost of distribution and physical setup is getting marginalized due to lower distribution cost (Mainly savings from low marketing spend), business persistency from loyalty customer base and spread of business categories
<ul style="list-style-type: none"> • Completely digital administering customer friendly purchase flows with lesser questions and providing more engagement in the customer lifecycle. • For example, ACKO allows motor insurance customers to fetch their traffic challans and store all policies in one wallet. • Besides Policy purchase, the service (Claims & endorsements) also through digital channels • Probably these insurers will gain the prominence with gradual increase in customer awareness so that customers can purchase insurance without assistance. 	Buying Process	<ul style="list-style-type: none"> • Offers the physical, assisted digital and only digital modes of buying process, however the purchase journey is still not customer friendly and intuitive, rather more focused to meet the internal underwriting requirements. • Provided convenience for all segments of customers and distribution channels • India's insurance purchase is a ~85% through assisted, hence all modes of buying enables better business
<ul style="list-style-type: none"> • Digital claim process with additional support such as Vehicle pick-up and drop facility • Online survey of vehicle and claim assessment avoiding delay in lieu of physical survey of loss • Complete digital have not helped the insurers to contain their claims cost due to their inaccuracy in the digital loss assessment 	Claims and paperwork	<ul style="list-style-type: none"> • Supports physical and assisted digital for claim processing • Introduced digital claim assessment and settlement for low value claims • Integration with the motor garages and TPA enabling faster decision for claim admissibility • Assistance from agents are invaluable as customers lacks literacy on the claim process

Comparison



New Age Insurers	vs	Traditional Insurers
<ul style="list-style-type: none"> Highly innovative products and features, however unable to garner larger market share due to lack of right channels of distribution Operating limited product segments like Motor, Health and embedded insurance segments, however not able to retain customers due to competition from traditional insurers Lacks underwriting appetite for the lesser volume of premium and highly concentrated product portfolios 	Products	<ul style="list-style-type: none"> Operates all segments of products across individual and business insurance categories Provides great spread of premium to cross leverage the risk mitigation of varies claim experience Ability to launch new products in the novel categories
<ul style="list-style-type: none"> New age insurers focus heavily on customer experience by creating user friendly platforms, mobile apps etc. Better customer engagement Value added services 	Customer Experience	<ul style="list-style-type: none"> Local presence for servicing customers across geographies Personalised assistance through agent and TPA network Better grievance management for varied insurance literacy across customers
<ul style="list-style-type: none"> Only Digital has not been a great success in India due to limited reach, limited products and higher marketing and servicing costs Partly digital and partly assisted digital has helped Godigit to garner better growth within same life span and efficient cost structure due to higher business through low COA channels such as assisted digital The Combined Operating ratio for claims+ distribution cost+ expenses are ACKO – 154%, Zuno – 140% and Godigit – 107% not showing the efficiency that should have been there Currently very insignificant in the industry to create any mark 	Sustainability	<ul style="list-style-type: none"> Higher volume of premium with a balanced product portfolio and spread across the geographic areas on india Provides sustainability from established customer base, efficient distribution channels The Combined Operating ratio for claims+ distribution cost+ expenses are New India – 117%, BAGIC – 100% and HDFC Ergo – 103% and Tata AIG – 110%. ICICI Lombard – 104% showing the efficiency of distribution and product spread These players control significant share of premium in India and has the ability to change the industry

Case Study



Riskcovry is an API driven Insurtech platform offering insurance-in-a-box solutions. It offers a plug and play platform where any business can use Riskcovry's API, license and SaaS technology to commence or augment an insurance distribution business without the traditional overhead of building teams/tech/license/processes.

The company has processed Gross Written Premium of more than INR 1,600 crs in the last financial year.

Problem Statement

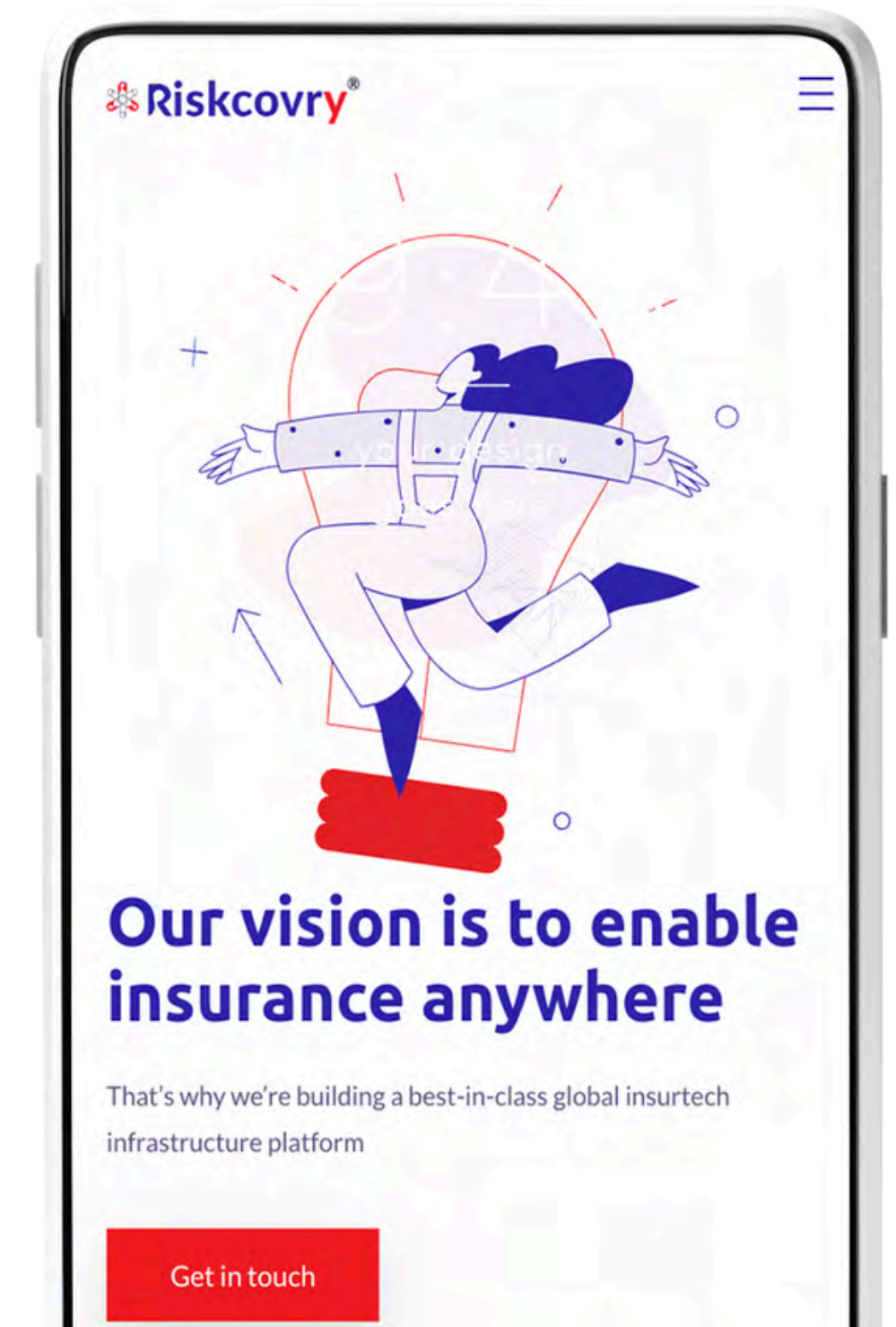
Currently, there are no common API standards with multiple kits, which are laborious to build and maintain with the TAT for API integrations, which have been running for several months today. Even a small change at the API level can take a very long time to implement, given bandwidth constraints. This precludes distributors from going to market quickly and achieving economies of scale, especially when they want to launch newer variants of the same product or a different product with either the same or new insurer. Moreover, capex for distributors is also blocked on account of non-core activities such as engineering for APIs and software for managing their businesses.

Technical Solution

Riskcovry has built the standardization for these disparate APIs in the insurance ecosystem by providing a single unified kit that masks all the complexities at the insurer's end and makes it more predictable. With a single kit, distributors go to market faster, monetize faster, and experiment faster. Reuse of these APIs enables higher economies of scale across distributors and frees up capex and company resources where end-to-end, specialized solutions are available at subscription or usage rates.

Impact

Distributors across 10+ industries are using Riskcovry's unified API for a 70% faster go-to-market with minimum effort required from their tech teams. This has reduced the cost of running their insurance businesses by over 100%. This has led to a much better customer experience from understanding the insurance product and making it more relevant to customers with the power of data.



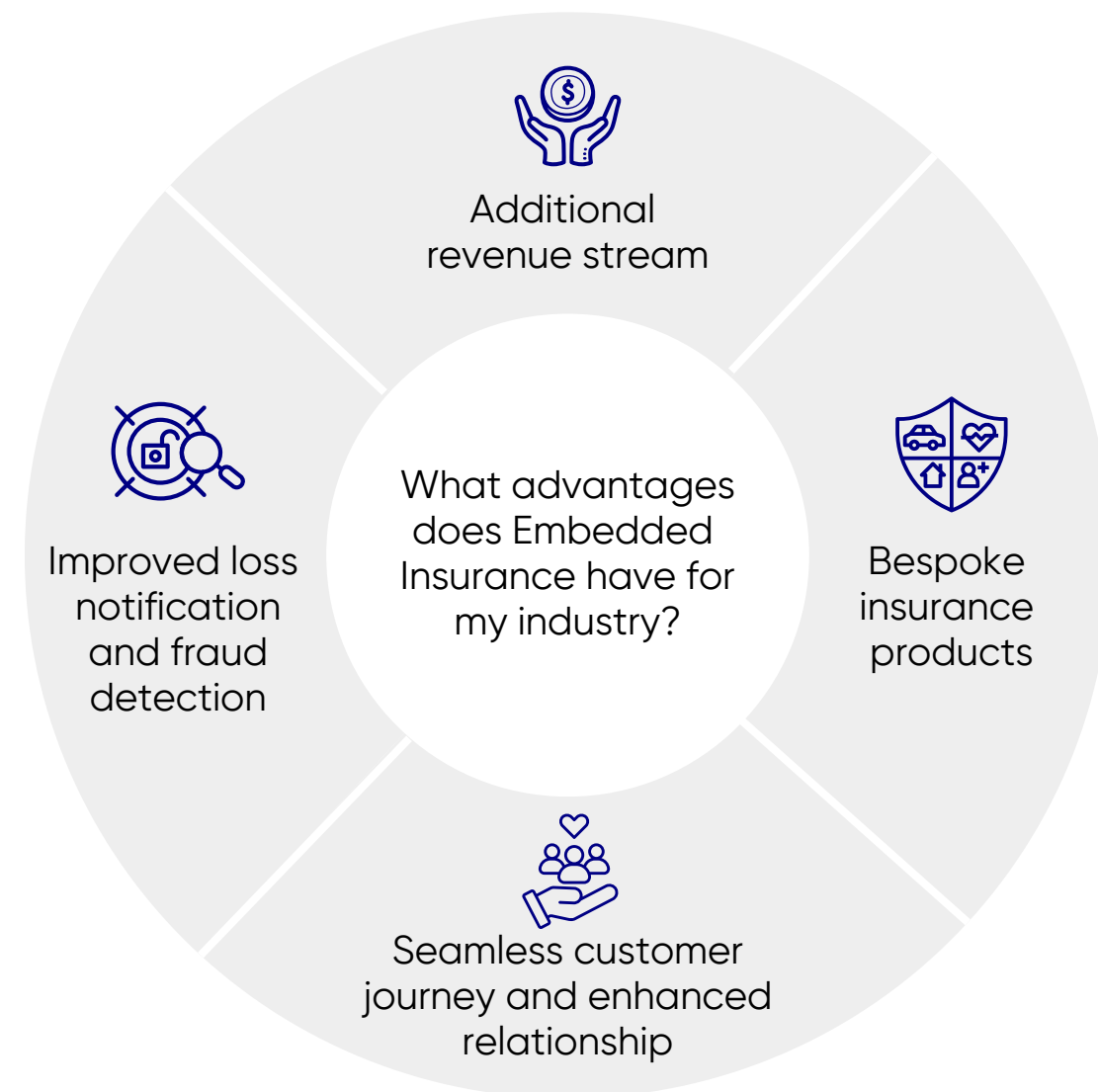
Embedded Insurance

Upcoming Revenue Stream or Innovative Way to Approach Insurance



- Embedded Insurance is a form of digital bundling, enabling partners from virtually any industry to offer insurance policies as an add-on or feature, generally as part of a digital sale.
- According to Swiss re global protection gap is expected to increase, and embedded insurance is pegged to bridge this gap with **\$484 Billion in market value**.
- Rise of embedded insurance can be attributed to several factors like customer convenience, distribution partnerships, technological advancements, and data-driven insights.

Why it is gaining traction

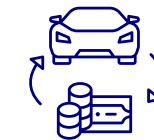


A few examples

Without Opt-out



Credit protection sold by certain banks and NBFCs at the time of loan



At the time of purchasing a vehicle

With opt-out



Electronic device extended warranty sold by online retailers



Appliance protection sold by energy providers



Baggage loss, trip delay insurance sold by online agency for booking multiple categories of travel services

Embedded Insurance

Upcoming Revenue Stream or Innovative Way to Approach Insurance



New insurance opportunities to be addressed



Online Retail

1-click away to add an extended warranty to a purchased good.



Property

Many renters/owners do not cover their assets and are not offered an insurance product as part of their application process.



Recurring Payments

1-click away to add insurance cover while making recurring payment such as education fees, SIP, etc which can protect and cover consumer at the time of job loss, accidental claim, etc.

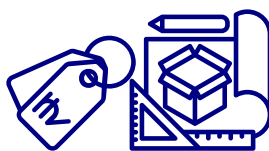
Challenges Ahead



Partnerships & collaborations



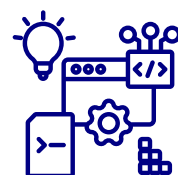
Customer awareness & trust



Product design & pricing



Claims handling & customer experience



Data integration & technology



Regulatory compliance

Embedded Insurance at the time of Rental Agreement



About the client

One of India's biggest, full-stack online proptech players, Housing.com offers listings for new homes, resale homes, rentals, plots, commercial spaces, and co-living spaces in India.

Use Case

The partner wanted to enter the insurance market by offering a one-of-a-kind "Rent protect cover" that allows a tenant to purchase a Personal Accident Insurance cover with a single click while coming on to their portal for paying online rent payments.

powering



Solution

The 'Rent Protect Cover' premium is embedded into the monthly rent payment workflow with Riskcovry's EmbedPro Platform. Tenants can secure protection in case of accidental death, hospitalisation, and critical illnesses. Unforeseen accidents and illnesses to tenants can end up requiring hospitalisation and hence can unexpectedly lead to default delay in rental income. Upon successful claims processing, a fixed benefit lump-sum amount is paid out, which can be used by Housing's customers to make good on due rental payments, which otherwise would have been at risk of default. Riskcovry's EmbedPro solution helps build relevant, contextual insurance products in any transaction workflow, giving brands a chance to build overall customer loyalty by providing value-loaded products without investing in the tech and workforce to build the solutions in-house.



Comparison with other Geographies



	India	GCC	Southeast Asia
Insurance Penetration	Insurance penetration in India remains moderate but is growing steadily due to increased awareness and government initiatives.	Boasts high insurance penetration, particularly in group health insurance and life insurance, reflecting its mature market.	Penetration varies across the region. Developed markets like Singapore show high penetration, while emerging markets like Vietnam and Indonesia have lower penetration due to infrastructure and financial literacy challenges.
Key insurance segments	Motor and life	Health (esp. group) and life insurance	Health and motor insurance dominate; microinsurance is growing in emerging markets
Insurance Literacy	Very low due to complicated policies: which also results in mis-selling of the policies	Insurance literacy is moderate, with ongoing initiatives to educate the population and promote awareness of coverage benefits.	higher in countries like Singapore, but low in emerging economies due to lack of education and accessibility
Insurance Distribution	Dominated by insurance agents; digital adoption now increasing	Insurance distribution is traditionally broker-driven but is witnessing rapid growth in digital channels due to increased internet penetration.	Agent-based channels dominate in less developed markets, while digital distribution and embedded insurance are expanding in advanced economies.
Regulatory Landscape	India's regulatory framework is stringent but evolving. IRDAI reforms aim to promote transparency, customer protection, and innovation in the sector.	The GCC's regulatory landscape is stable, with an emphasis on Sharia-compliant insurance products (Takaful) and adherence to Islamic principles.	Regulatory frameworks differ significantly. Singapore has a strong, well-regulated market, while other countries like Vietnam and Indonesia are still improving oversight.
Insurance Product	Offers a variety of insurance product across spectrum	GCC markets focus on life and health insurance, particularly Sharia-compliant solutions tailored to cultural preferences.	Southeast Asia is diversifying with microinsurance, parametric insurance, and usage-based products to cater to the needs of diverse populations.

Comparison with other Geographies



	India	GCC	Southeast Asia
Claim Process	Claims in India are traditionally lengthy and paper-based, though digitization efforts are underway to streamline processes.	The GCC offers relatively efficient claim processing, especially for group health insurance plans, with customer-centric approaches.	Region is heterogeneous, with mature markets like Singapore having highly efficient and digitalized claims processes, while emerging markets like Vietnam and Indonesia face infrastructure limitations, leading to delays. Insurance literacy and accessibility also impact claims processing, with varying levels of maturity across countries.
Embedded Insurance	Embedded insurance is at a nascent stage in India but is gaining traction, especially in collaboration with fintech and e-commerce platforms.	Embedded insurance is becoming more common, with increasing partnerships between insurers and digital platforms to offer seamless coverage.	Embedded insurance is emerging in digital ecosystems, especially in developed economies like Singapore, where partnerships with tech companies drive adoption.
Overall Outlook	India's insurance sector shows promising growth, driven by increasing technology adoption, government policies, and the untapped rural market.	The GCC insurance market is stable and growing, driven by health and group insurance, and a focus on expats and nationals.	Southeast Asia presents a mixed outlook. Developed markets like Singapore exhibit robust growth, while challenges like low penetration and poor infrastructure persist in emerging economies.
Government Initiatives	Government initiatives like Ayushman Bharat, IRDAI reforms, and financial inclusion programs are significantly boosting insurance accessibility in India.	GCC governments are introducing favorable reforms to enhance stability, compliance, and accessibility in the insurance market.	Government efforts vary across the region. While countries like Singapore invest in healthcare and insurance reforms, others focus on microinsurance and financial inclusion for underserved populations.

Emerging Products



Particulars	Cyber Insurance	Parametric Insurance	3-in-1 Insurance & 2-in-1 insurance
Meaning	Cybersecurity insurance (cyber insurance) is a product that enables businesses and individuals to mitigate the risk of cybercrime activity like cyberattacks and data breaches. It protects organizations from the cost of internet-based threats affecting IT infrastructure, information governance, and information policy	In this kind of insurance a fixed previously decided amount of cover is disbursed once a triggering event occurs (level 7 earthquake, water level rises by 1 m) instead of covering the actual loss faced	This are kind of insurance where a single policy is provided for heath and life or health, life and other insurance in the same umbrella. This kind of product are getting traction after IRDAI allowed it in "use and file" policy and launch of Bima Vistaar
Premium Calculation	Similar to traditional method but along with idiosyncratic and systematic risks it also contains systemic risks which are kind of risks that can interconnected and can spread rapidly through a network, affecting multiple policyholders and potentially causing widespread damage.	Model similar to traditional method is used considering the probability of certain event occurring and the individual related details is used to calculate the premium.	Similar to traditional method, likelihood for all event occurring at the same time is also calculated to set the final premium
Revenue Model	Premium, additional services and subscriptions	Premium, additional services and subscriptions	Premium, additional services and subscriptions
Benefits	<ul style="list-style-type: none"> Insurers often don't provide insurance for cyber crimes, cyber insurance becomes necessity with increasing cyber crimes Provides services and company cyber security review necessary to avoid such incidents 	<ul style="list-style-type: none"> By eliminating the claims assessment process, parametric insurance speeds up the disbursement of funds, enabling affected communities to recover more quickly Since the asset vulnerability does not enter the equation, the underwriting and claims payment process are much simpler than for traditional insurance: The objective nature of parametric triggers lessens the risk of moral hazard, where insured parties take advantage of the insurance for their benefit. This cannot happen here as insurance is totally based on triggering event. Highly customizable 	<ul style="list-style-type: none"> No more headache of handling various policies. Bundling multiple insurance products can lead to cost savings for policyholders. All-in-one insurance policies combine multiple insurance protections, providing a broader range of coverage for policyholders.

Emerging Products



Particulars	Cyber Insurance	Parametric Insurance	3-in-1 Insurance & 2-in-1 insurance
Challenges	<ul style="list-style-type: none">• Limited loss history for insurers to use when setting prices for cyber insurance premiums and coverage loss limits, and this introduces risk.• Unlike other insurance here we have risks that result through networks and can affect a large number of clients at the same time (systemic risks) along with idiosyncratic and systematic risks• Scrutiny and evaluation of a firm’s cyber protection levels are very difficult. Supply chain makes it more difficult, with the increasing connectedness of businesses, the risks associated with third-party vendors and supply chain partners are on the rise.• Premium and models keep evolving with changing technology and types of attacks	<ul style="list-style-type: none">• Potential mismatch between actual risks and triggering event• Traditional insurers may see parametric insurance as a threat to their market share, hindering its broader adoption.• One concern for regulators has been that an event could trigger a payout when the policyholder has not experienced any financial loss. Depending on the jurisdiction and the details of the policy, this may be overcome by requiring claimants to confirm they have experienced a loss through a text message or signing a statement of loss.	<ul style="list-style-type: none">• Bundled insurance products may restrict the options for customization, making it difficult for policyholders to tailor coverage to their specific needs.• Policyholders may end up over-insuring, leading to unnecessary expenses and potential disputes with insurance providers.
Company	Mitigata (India), Chubb (Global)	Bima Vistaar an initiative by IRDAI is a type of parametric insurance, Gram Cover	Government initiative- Bima Vistaar

Interview with Riskcovry



Chiranth Patil

Co-founder

What are the biggest operational challenges Riskcovry has faced in scaling its insurtech services and how have you addressed them?

By way of quick intro: Riskcovry is an India based InsurTech Infrastructure company. Our vision is to enable insurance anywhere. We believe in a world where every enterprise is not only a fintech company but also an insurtech company...and minimise customer risks and enhance their LTV.

At Riskcovry, we want to be the simplest and fastest platform for enterprises to launch and scale their insurance distribution business. As it stands, we are perhaps India's only pure-play digital infrastructure platform that not only helps any enterprise to offer multiple insurance products in an omni-channel way (assisted, self-serve or embedded), but is also the insurance distribution "system of record" for our enterprise customers.

In terms of operational challenges to hitting scale, all middleware business models such as ours, be it digital-first or otherwise, are prone to partner dependency at either end. In our case, we have partner dependencies with our customers, as well as with our insurer partners. With the former, our success is closely tied to our customers' successes. On the insurer partner end, we rely on them to make their products available via APIs and need timely sign-offs to go live. Against this backdrop, patience has been paramount in tackling some of these challenges; we always aim to solve this one problem statement at a time and build brick by brick, given that building infra is depth + breadth game, and costs are all front loaded.

To solve for such "barrier to scale" fundamentally requires a great product ie, to achieve the critical mass of APIs and tech capabilities necessary for our infrastructure solution stack to scale and ultimately bring in network effects to minimise partner dependency. To truly cater to the largest of enterprises, digital infra companies would need to offer integrations and workflow capabilities out-of-the-box, so that customers who leverage these capabilities can go to market most quickly and simply.

With deep integrations into customers' tech stacks on one side and the insurer systems on the other, enabling that seamless orchestration layer is hard. It took us close to 5 years to achieve critical mass by building one API at a time across 40+ insurers with highly fragmented API standards and varying legacy tech. Riskcovry's platform offers more than 170 insurance and subscription products on open-API principles – the largest catalogue available in India under a single platform.

Interview with Riskcovry



Given that embedded insurance has gained traction in other geographies, why do you think it's been slow to take off in India particularly with alternative players? What challenges or barriers do you see that may be contributing to this today?

Embedded insurance is conceptually not new – here in India nor elsewhere. In a way, it has been around for at least a couple of decades, if not more in India – banks and NBFCs have been attaching insurance against credit for time immemorial, and globally this has also been the most common embedded insurance use case. In India, the innovation journey has been that insurance attached against credit is the first use case to be digitized faster than some of the other categories. However, embedded insurance in alternate channels of distribution (which is what is most spoken about today), is also gaining traction. Ticketing companies have been enabling attaching travel insurance for baggage assistance, trip delay, trip cancellation, etc.

If we were to juxtapose this with our global peers, it is simply a function of time given that insurance penetration in India itself is low relative to global standards. Moreover, globally, digital transformation across industries has seen varying degrees of velocity with some further ahead in their journeys relative to others. Embedded insurance via alternate channels will likely follow the same path; as digitization becomes more pervasive, especially in financial services, we'll see embedded insurance follow the same trajectory. It is for this reason that we believe we are timing our entry into the market to coincide with that impending growth.

Do you believe that insurance companies still lack the necessary infrastructure APIs for renewals, claims, and other services and how it has impacted you to grow?

The short answer is yes. Insurance is among the most complex financial services not just from a product point of view but also in terms of underwriting and distribution. The only solution for us at the time was to build this out brick by brick. However, the good news is that we have gotten better in our understanding of the APIs as well as our relationships with insurer partners and this has, for the most part, offset some of the challenges we faced earlier. While the universe of insurance APIs grows every day, our ability to integrate with the rest of the products and insurers that we hitherto haven't integrated into has gotten better by leaps and bounds.

Why has the claims journey not been fully digitized despite the development of various solutions for fraud, waste and abuse? What factors have led to indian insurance companies still relying heavily on manual processes?

We are seeing a 2 world views wrt digitising claims. Traditionally, many industries have benefited from information asymmetry and insurance is no different in that respect. To such some, digitizing claims can be antithetical to the business model of pooling insurance premiums and servicing claims from the same pool. The insurance business model doesn't align with the customer experience even with rudimentary processes such as digitizing claims submission. By design, some friction in the claims process certainly aids the bottom line.

However, on the other hand, progressive insurers look at customer experience first; there has been an overwhelming response from consumers to incorporate seamless digital claims journeys.

Interview with Riskcovry



Ultimately, we'll see all insurance companies adopting digital and transparent claim journeys as the adage of "customer is king" in markets across the board will hold for the most part. We are seeing this change happen faster than what we perhaps may expect; many insurers are offering claims intimation and status APIs, across products, to sophisticated intermediary channels, which can uphold the claims experience and trust experience which becomes the moment of truth for the end insured, and by extension, the insurer too.

In the entire insurance journey, what areas do you believe are ripe for most innovation and disruption and why?

Shall stay on the topic of the claims you brought up.

Across the insurance lifecycle of buy, manage and claim, the first two to a large extent have been fairly digitized with multiple products, but still a very long way to go for complete digital coverage. Claims, however, are certainly whitespace in the industry that is most imminent in terms of disruption and innovation.

Today, a sizable portion of claim rejections stem from incorrect or inadequate information supplied by the policyholder. Simple API integrations across a customer's digital properties can go a long way in auto-populating most of the information required in a claim form. However, there are more complex problems associated with fixing claims; these range from pulling the right information from hospitals in the case of health insurance to real-time data from garage workshops in the case of motor insurance.

Solving this would indeed need an ecosystem approach as there are multiple stakeholders. Ultimately, the customer should have multiple touchpoints to file a claim with speedy validations across stakeholders to ensure seamless payouts. As alluded to earlier, the overwhelming demand from consumers will spur change across the spectrum of stakeholders to adopt digital practices to solve on-the-ground consumer pain points where underwriters and distributors are only two parts of the entire value chain.

Many models such as MGA, etc are well-adapted outside India. What do you think are the reasons these models haven't effectively been introduced or implemented in the Indian market?

In today's context, MGA (Managing General Agent) is not recognized as an intermediary model. Corporate Agencies and Broking licenses (Direct, Composite) today are the top categories of insurance distribution intermediaries regulated by our regulator, IRDAI.*

In our opinion, while it may be tempting to compare sectors with our global counterparts, India is a unique country driven by diverse needs/wants with deep-seated cultural behaviours, especially around financial services. It is in this context that force-fitting a model that exists abroad may not reap the intended benefits in India. Stakeholders across the value chain could be weighing the potential risks and benefits of such a model as these things do need careful consideration, and is for our regulator to ultimately decide, keeping the common man at the center of all decisions, as they always do.

*A Managing General Agent (MGA) is a specialized type of insurance agent/broker that, unlike traditional agents/brokers, is vested with underwriting authority from an insurer. An MGA is authorized by an insurer to transact insurance business and may have authority to bind the insurer, issue policies, appoint producers, arrange for reinsurance, and provide other administrative support, depending on the specifics of the MGA agreement.



Investment

Interview with Jefferies



Jefferies

Aashish Agarwal

Country Head - India

We are witnessing a remarkable surge in the unique investor base, with nearly 1 crore new investors added in the last five months. What do you think are the key factors driving this significant growth and do you see this as a sustainable trend or a sign of irrational exuberance? Further, it seems retail investors are increasingly influencing market trends. Could this lead to excess speculation and volatility in Indian equities?

The surge in investor base is remarkable, fuelled by increased financial literacy, desire for higher returns, and accessible digital trading platform. A large jump in market participants may not be immediately repeatable, however the broader trends can sustain given growing middle class and tech adoption. Though parts of the market can get exuberant at times, retail investors also provide essential liquidity and aid in efficient price discovery, ultimately stabilising the market. Growing retail base also reduces reliance on institutional participation (particularly foreigners), enhancing market resilience and depth. Modern retail investors can contribute to a balanced market, fuelled by data and educational resources, and with proper regulation can continue to benefit Indian equities.

With Trump advocating for an end to wars while simultaneously pushing for higher tariffs, how do you see the geopolitical landscape evolving? Specifically, what impact could these policies have on U.S.-India relations, global trade dynamics, and capital flows into emerging markets like India? Do you foresee increased protectionism affecting investment sentiment in the region?

The start of the Trump presidency has been tough for EM currencies, and corresponding equity flows from foreigners, though this trend was partly witnessed in the 1st term and was shortlived. End of wars is seen to be fundamentally disinflationary, likely reducing energy and food prices in the medium term, a substantial positive for India. The evolution of tariffs will play out over time but India could come across as a net beneficiary vs. most of its competitors. The Trump-Modi summit in the US has signalled the signing of a larger US-India trade deal, cooperation in multiple sectors (electronics, semis, AI, pharma, defence etc). Jefferies macro strategist also believe that as US trade deficit potentially declines, we could see the EM pressures reduce. This presents significant opportunity for India, as trade realignments could attract investments to India as companies diversify supply chains to avoid disruptions. Overall, India could become a more attractive destination for global investments, further strengthening economics prospects.

Interview with Jefferies



Given the recent surge in market volatility, do you believe this is a short-term correction or the beginning of a prolonged period of uncertainty? Further, do you believe the IPO boom in India will sustain its momentum, or are we approaching a period of slowdown? What key factors will determine whether the IPO pipeline remains strong or starts to taper off?

The Indian economy is in a strong growth phase, with a broader investment cycle in place, which alongside maturing Unicorns and Private equity held assets creates an impressive pipeline of new companies to list on the public markets. The market volatility periods do induce a natural pause as both the buyers and sellers arrive at a new valuation consensus; however, we see the current volatility as a passing phase. While the 2024 equity market supply was at a record pace, we note that it was still under 2% of market cap. Strong growth phase in China in the previous decade have seen upto 2x of that supply pace. With the Reserve Bank of India cutting interest rates to stimulate growth, and the economy showing resilience amid global uncertainties, the IPO pipeline is expected to remain strong. Increased capital flows into India could boost key sectors like power, electronics and pharmaceuticals, making India an even more attractive destination for global investments.

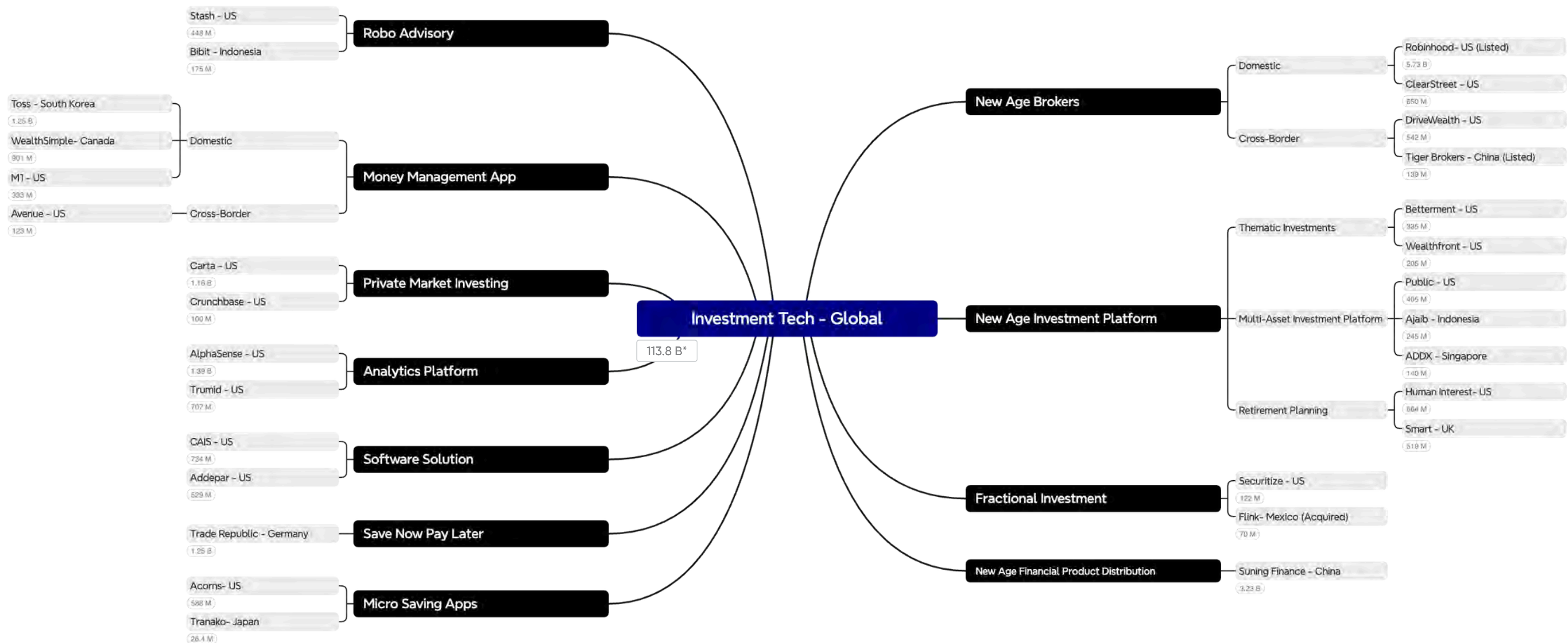
Recently, we've seen a trend of companies reverse flipping their corporate structures to get listed in India rather than abroad. What do you believe has prompted this shift in preference? What changes or advantages in the Indian market have influenced these companies to prioritize domestic listings over international ones.

Reverse flipping is the outcome of growing maturity of Indian capital markets, the depth of India's domestic capital pool and the good valuations on offer. A combination of SIP driven MF inflows, direct retail money in single stocks, insurance & pension funds etc. are now injecting an average US\$7-8bn/mth in the equities market. This offers strong opportunities for new equities to list and indeed, we have seen both 2023 and 2024 absorbing US\$60-70bn (annualized) equity supply. Success of recent tech-listings also showcase growing investor appetite for new age business models. Broadly, we see India on the way to nearly doubling its market cap to US\$10Trn by 2030 and a diverse set of equity offerings will find a place in the same.

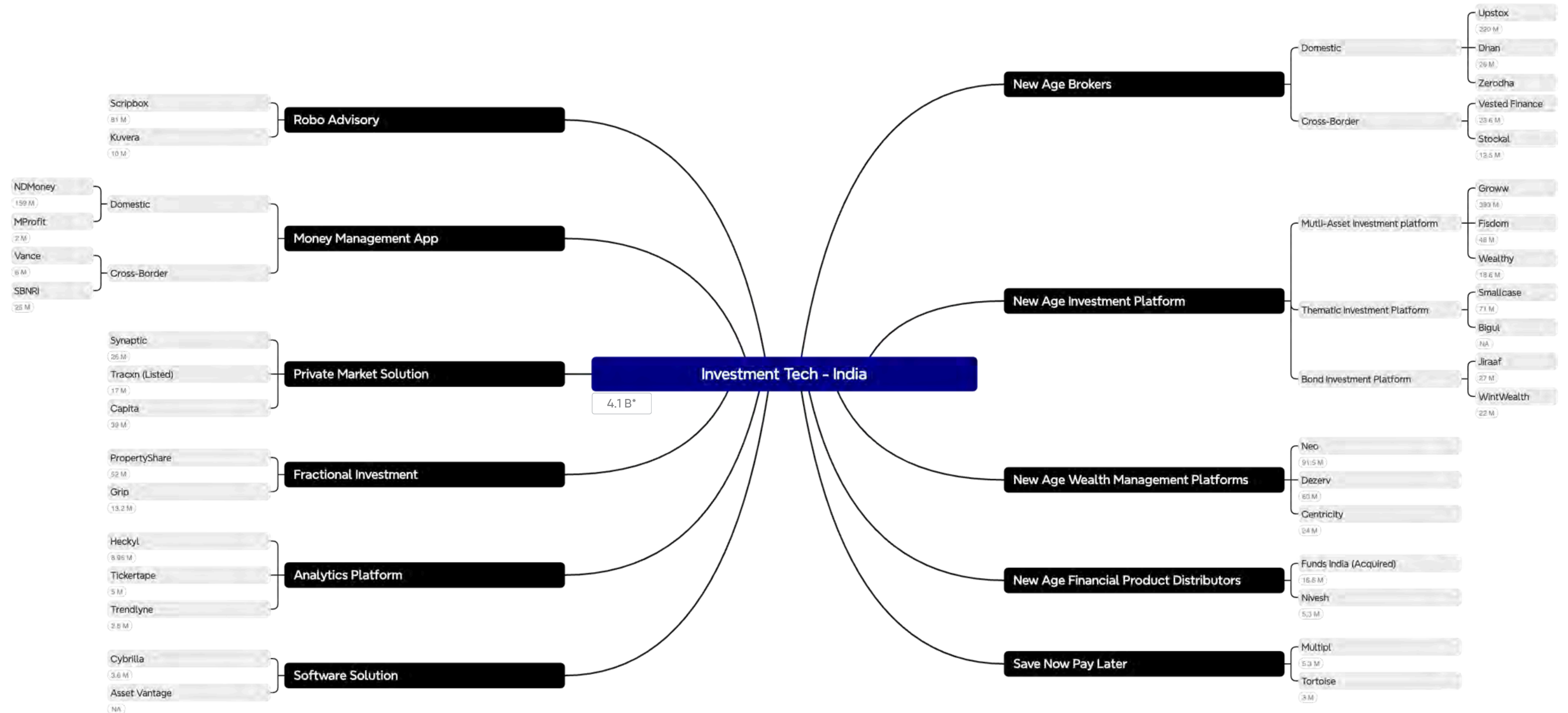
There seems to be a growing disconnect between stock prices and corporate earnings in the Indian market. Do you believe this poses a long-term risk to market stability? Furthermore, has excess liquidity been the primary driver of valuations, or are there other factors at play?

The earnings, valuations and stock prices do play catch up from time to time. Earnings growth has slowed in 2024, but as the circumstances reverse with an income tax cut, interest rate reduction and govt. spending uptick; the outlook for earnings in 2025 is positive. The Indian economy remains resilient, supported by strong fundamentals and proactive measures by the Reserve Bank of India. While excess liquidity has contributed to valuations, other factors such as robust domestic demand, technological advancements, and a thriving startup ecosystem are also driving the market. These elements contribute to a positive outlook, suggesting that the current trends can be sustained with proper regulatory oversight and continued economic growth.

Global Mindmap



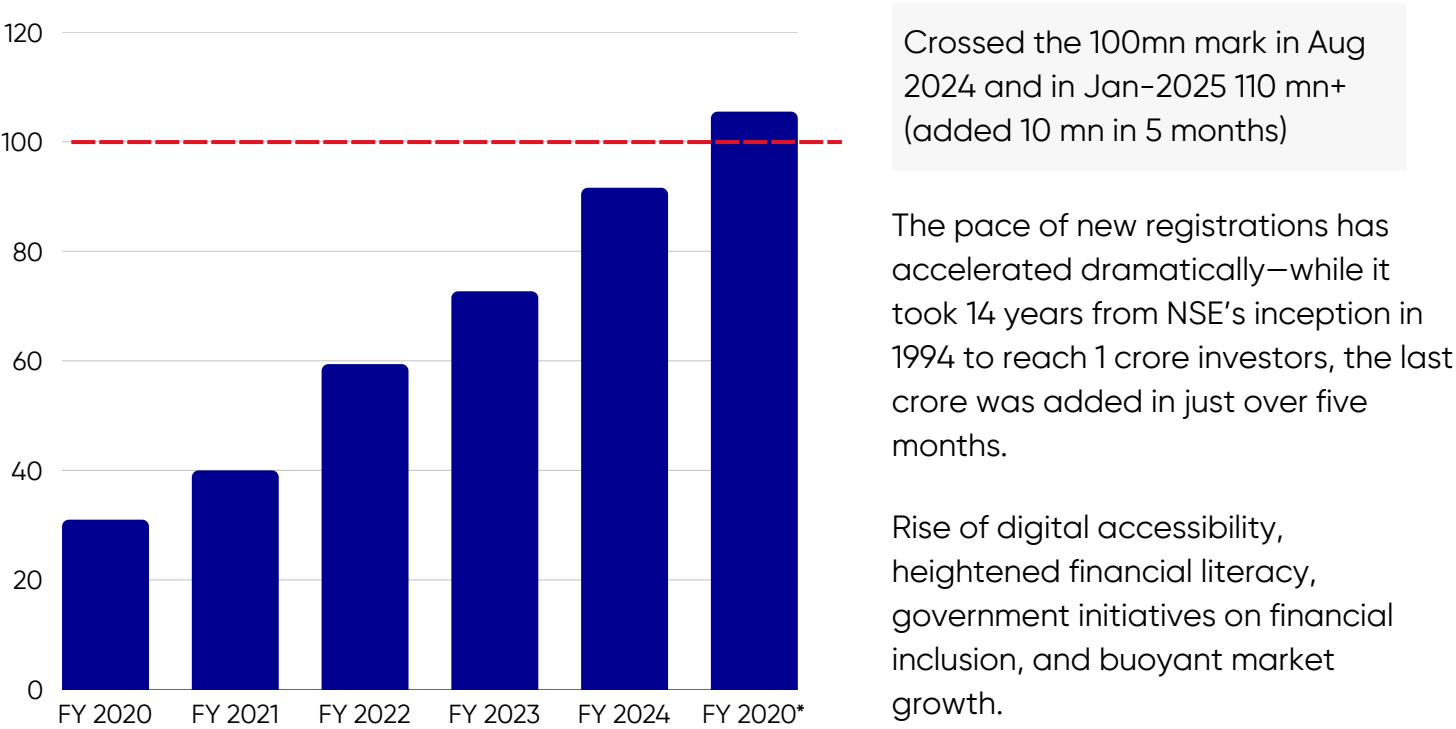
India Mindmap



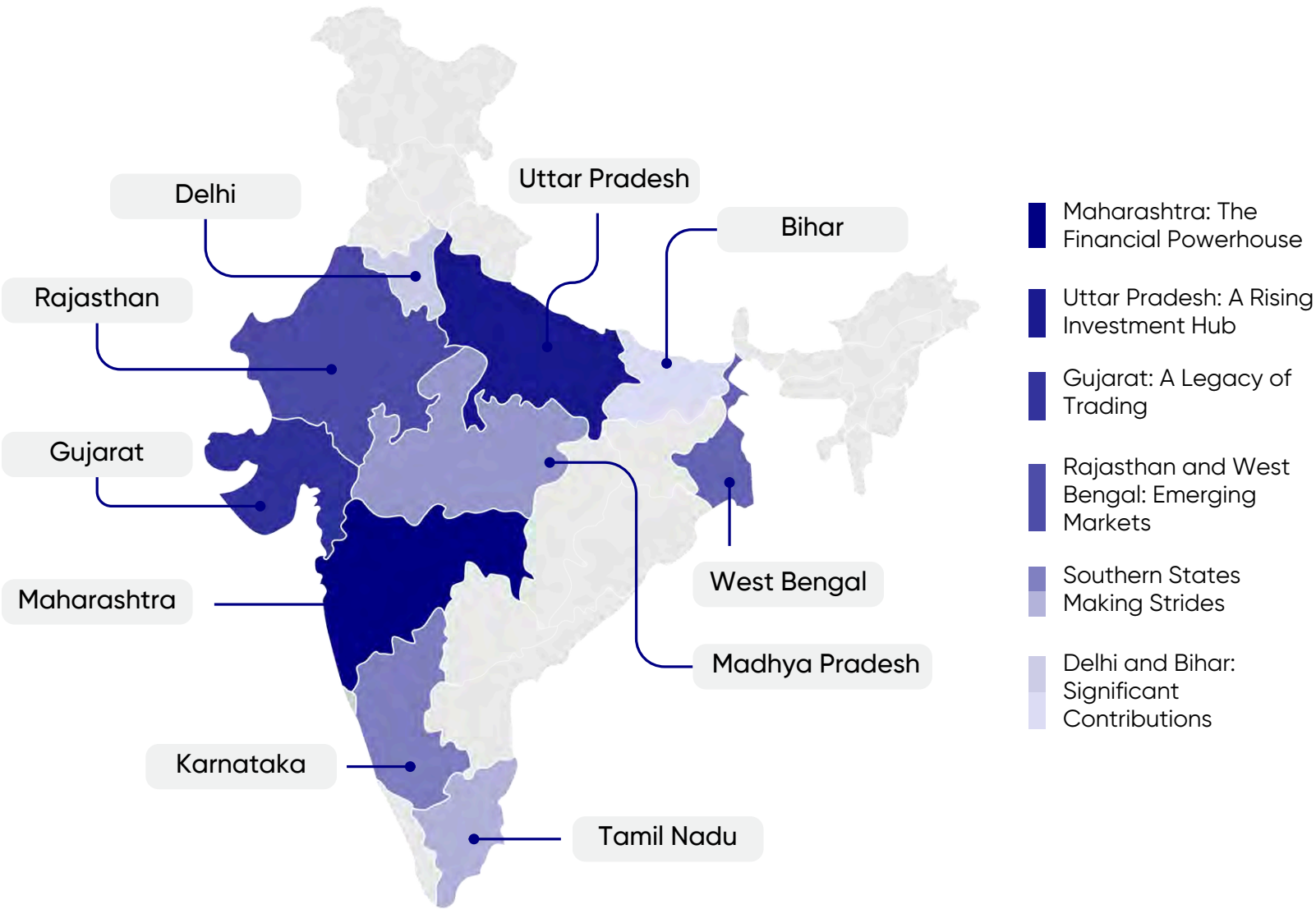
Growing Retail Investor Demand



Number of unique investors in NSE:



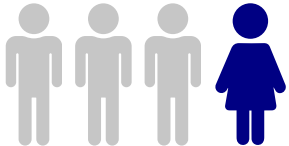
Top Indian States by Registered Investors (MAP)



Recent Trends:



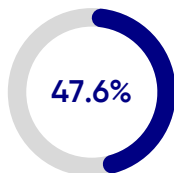
Median age of investors now: 32 years from 38 years five years ago, 40% new investors are <30 years



1 in 4 investors is a woman



99.84% of Indian pin codes now have market participant



47.6% of new investors come from districts outside the top 100



Source: Statista, NSE

A Surge in Wealth Creation



Mutual Fund

Figure-1: AUM to GDP ratio of MF industry for 2023

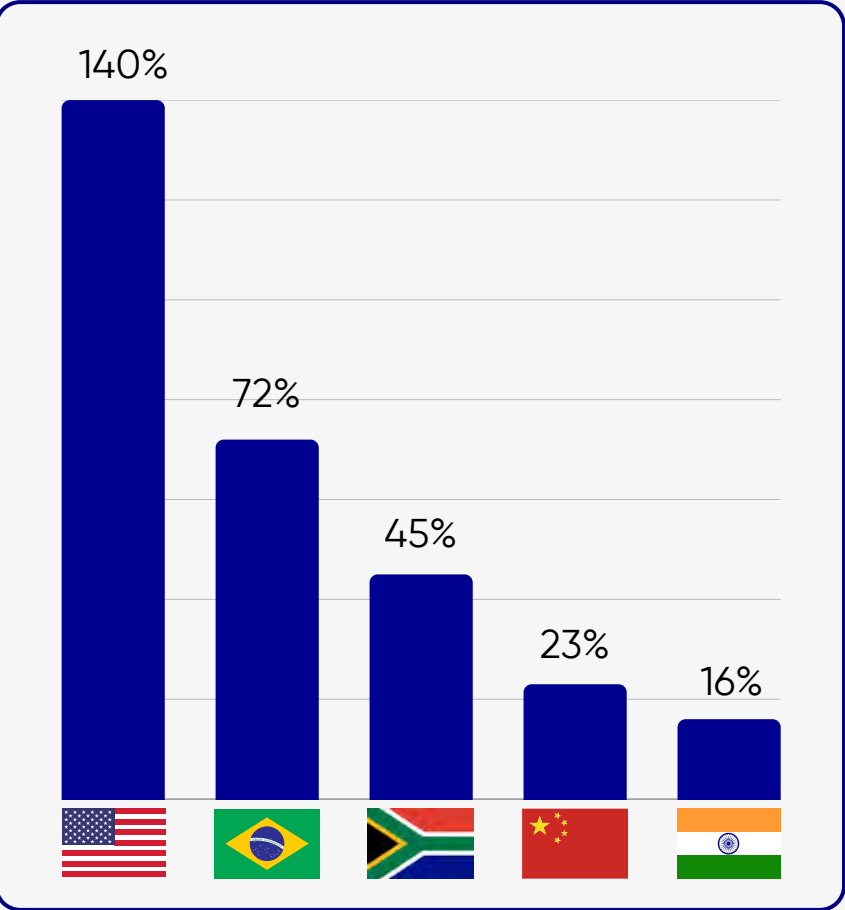
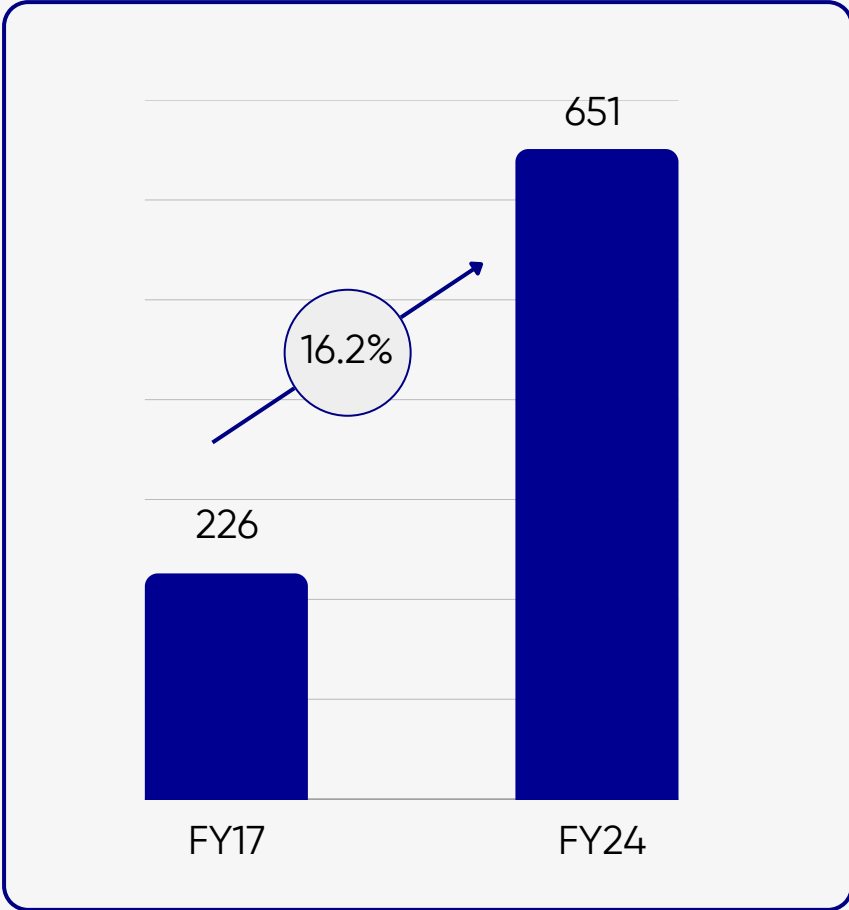
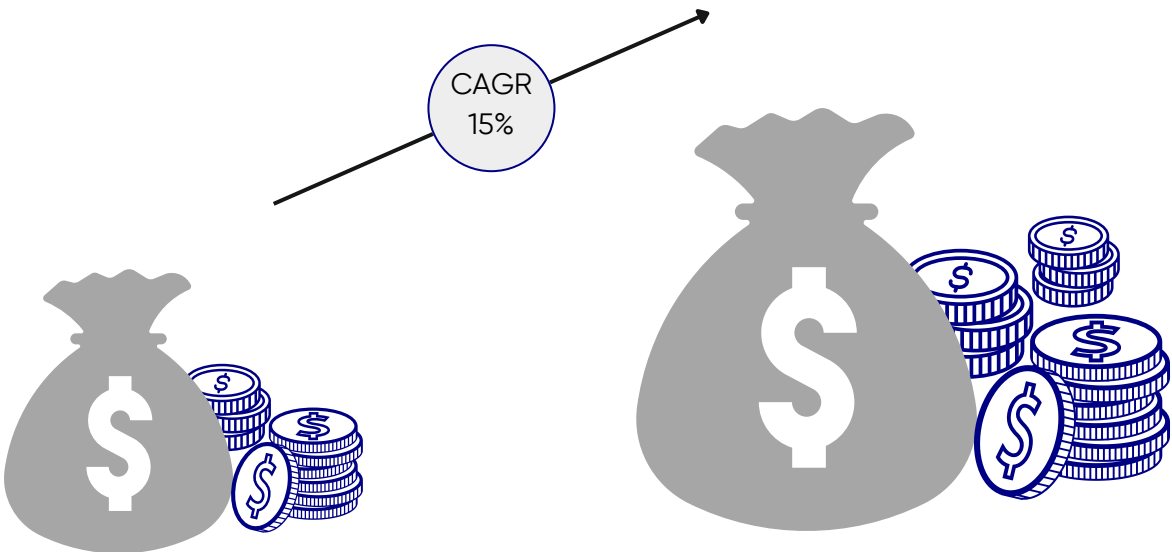


Figure-2: AUM managed by Indian MF industry (US\$ B)



Mutual fund AUM in India registered a 16.2 percent CAGR from FY17 to FY24, reaching US\$651 billion. However, comparing the mutual fund AUM to India's GDP ratio (16 percent) with other countries (see above chart) 4 shows India is still under penetrated and presents significant growth opportunities



US\$1.1 T
Total estimated demand for wealth management services in terms of AUM - FY24

US\$2.3 T
Total estimated demand for wealth management services in terms of AUM - FY29

Recent rounds in wealth management space:



Interview with Centricity



Manu Awasthy

Co Founder & CEO

To start, could you provide an overview of how Centricity distinguishes itself from other established wealth management firms like 360 one and Nuvama, especially in terms of customer acquisition strategies?

Centricity is structurally and functionally different from traditional wealth management firms. While most incumbents rely heavily on the skills and relationship management abilities of individuals, our DNA is technology-first. Technology plays a significant role in our operations, accounting for about 60% of our engagement model, compared to only 40% reliance on individuals. This approach allows us to offer higher operating efficiency and objectivity in decision-making, which is a key differentiator from the older, more people-centric firms.

What role does technology play in ensuring that the recommendations you provide are aligned with clients' financial objectives? How do you avoid potential biases, particularly when dealing with your own products versus third-party products?

Technology plays a critical role in our operations across three levels. First, we aggregate data from multiple sources into a single dashboard, providing multi-asset and multi-advisor reporting. This helps us manage and assess risk profiles effectively. Second, we focus on diagnostics, analysing the data to provide insights such as sectoral exposure and risk-to-return ratios. Lastly, algorithms and generative AI help us provide actionable recommendations, minimizing the influence of human biases and ensuring decisions are based on objective data.

Are you currently using account aggregators for data aggregation? How does this fit into your broader tech strategy?

Yes, we use account aggregators like Finvu, Protean particularly for our RIA clients. For distribution clients, we pull data from various sources, including email scraping and other aggregation methods. Our goal is to make data aggregation as seamless as possible across all asset classes and client segments.

Interview with Centricity



Larger players often manufacture their own products, but there's sometimes concern about returns compared to third-party products. How does Centricity position itself in this regard?

We strongly believe in maintaining neutrality to avoid conflicts of interest. Our Invictus platform, for instance, is designed to democratize access to a broad range of products without any bias towards proprietary offerings. We avoid the product push approach, ensuring that our clients have the freedom to choose from a wide array of options. This strategy has been a significant pull factor for us, especially among family offices. The human touch is delivered by a team of highly qualified and experienced portfolio coaches that handhold client journeys and navigation.

The wealth management industry in India is known for its low margins compared to other markets like Singapore. What motivated you to start your business in this environment, and what challenges and opportunities do you see?

India's wealth management landscape is indeed highly regulated and becoming increasingly margin-thin. The only way to thrive in such an environment is through heavy investment in technology to reduce reliance on manpower. By automating processes and minimizing physical interventions, we can lower costs and improve profitability while aligning closely with client interests. This tech-driven approach is what we believe will set us apart in the long run.

With increasing regulatory scrutiny, how do you anticipate these changes impacting your business, and what steps are you taking to adapt?

We foresee a significant reduction in distribution margins, potentially down to 30-40 basis points over the next few years. We're prepared for this shift by investing in deep tech solutions that enhance client interactions and reduce backend operational costs. This allows us to build a scalable distribution network, particularly in underserved markets like tier-two and tier-three cities, without relying heavily on traditional manpower-intensive models.

Many wealth management firms face challenges when relationship managers, who manage large AUMs, leave the firm. How does Centricity address this issue?

Technology is the key to mitigating this risk. By embedding our solutions deeply into the client's operations, we ensure that the value provided by our technology outweighs the reliance on individual relationship managers. This reduces the likelihood of clients following an individual rather than staying with the firm.

Interview with Centricity



Could you elaborate on the role of generative AI in your wealth management processes? What specific use cases are you focusing on?

Generative AI will be crucial in three main areas: making future investment decisions, optimizing current portfolios, and planning for market corrections. By leveraging AI, we can analyze a vast array of variables to provide highly specific recommendations that are both predictive and responsive to market conditions. This capability is especially valuable in the complex and variable-driven world of wealth management.

How does your technology differentiate itself from platforms like Asset Plus or Beyond IRR?

Invictus caters to a different segment of clientele, specifically family offices and UHNWIs who can maintain 100+ cr. financial portfolios with us. Platforms like Asset Plus or Beyond IRR operate in the B2B2C space, focusing on making the journey more efficient for distributors rather than end clients. We address this segment through our OneDigital platform and proposition for IFAs, MFDs and FPDs. An access to a comprehensive product suite, seamless digital execution, reporting, analysis and assistive tools help independent financial entrepreneurs serve their clients better. OneDigital caters to the segment below 100cr financial portfolio in a B2B2C format, helping us build a highly scalable distribution network in tier 2/3/4 cities in India. This segmentation helps us go deep as well as wide into the wealth industry. In contrast, Invictus is competing with firms like 36one and Novama Wealth, and our technology is built to serve the specific needs of ultra-high-net-worth individuals with a more sophisticated and comprehensive approach.

Lastly, you mentioned generative AI use cases earlier. Could you expand on how generative AI is being integrated into your wealth management offerings?

Generative AI is particularly useful in wealth management due to the complexity of the variables involved. We are focusing on three key use cases: first, determining what to invest in for the future; second, optimizing the current portfolio in response to market conditions; and third, creating strategies for adverse market scenarios. Generative AI can analyze vast amounts of labelled and unlabelled data to provide specific actionable insights that are highly valuable in wealth management. We are working on integrating these AI-driven tools into our platform to enhance our clients' decision-making processes.

SEBI Introduces Regulation

Balancing Retail Investor Protection and Industry Impact



T+0 Settlement Cycle (Effective Mar 28, 2024)

Details: SEBI launched the optional T+0 settlement cycle for select stocks, later expanding it to the top 500 stocks by December 31, 2024. This mechanism allows same-day settlement of trades to enhance liquidity and reduce counterparty risks.

Rationale: The goal was to align with global best practices, improve market efficiency, and attract investors by offering faster access to funds and securities.

Impact on Fintechs:

- **Operational Costs:** Brokers faced significant investments in technology upgrades to handle real-time settlements.
- **Liquidity:** Increased liquidity benefited high-frequency traders but posed challenges for retail investors relying on margin trading.
- **Adoption Challenges:** Limited initial adoption created a fragmented market with dual settlement systems.

Industry Reactions: Shrey Jain, CEO of SAS Online: "T+0 settlement frees up brokers' funds within the system, reducing overall costs." Vamsi Krishna, CEO of StoxBox: "This transition enhances efficiency and mitigates transactional risks, benefiting both traders and investors."

Response by Fintechs: Companies like Zerodha and Groww focused on educating clients about T+0 benefits while upgrading backend infrastructure to support the new cycle.



True-to-Label Pricing (Effective Oct 1, 2024)

Details: SEBI mandated uniform transaction charges across brokers, eliminating volume-based discounts from MIIIs. This move aimed to simplify fee structures and ensure transparency.

Rationale: The regulation sought to level the playing field for brokers and protect retail investors from opaque pricing mechanisms.

Impact on Fintechs:

- **Revenue Losses:** Discount brokers like Zerodha faced a hit to their margins as rebates were eliminated.
- **Pricing Adjustments:** Many brokers revised their fee structures to offset revenue losses.

Industry Reactions: Nithin Kamath, CEO of Zerodha: "This will likely end zero-brokerage models for equity delivery trades as we lose around 10% of our revenue." Trivesh D., COO of Tradejini: "This is a watershed moment for smaller brokers who now compete on equal footing with larger players."

Response by Fintechs: Companies explored alternative revenue streams such as subscription models or premium services while maintaining competitive pricing strategies.



SEBI Introduces Regulation

Balancing Retail Investor Protection and Industry Impact



Restrictions on Speculative Trading in Derivatives (Effective Nov 20, 2024)

Details: SEBI imposed stricter norms on derivatives trading by increasing lot sizes and limiting daily expiries for index options. The aim was to curb speculative trading among retail investors.

Rationale: Data revealed that 93% of retail traders incurred losses in derivatives over three years. SEBI aimed to protect these investors from excessive risk-taking.

Impact on Fintechs:

- **Volume Decline:** A sharp drop in derivatives volumes affected revenue streams for brokers.
- **Shift in Focus:** Retail traders moved towards less risky instruments like mutual funds or ETFs.

Industry Reactions: Nithin Kamath: "While these changes are well-intentioned, they may lead to a significant drop in derivatives volumes." Brokers like Angel One expressed concerns about reduced trading activity impacting revenues.

Response by Fintechs: Platforms introduced educational content promoting long-term investment strategies and diversified their product offerings to retain users.



Crackdown on Financial Influencers (Effective Jul 2024)

Details: SEBI barred registered entities from associating with unregistered financial influencers (finfluencers) to curb misinformation and protect retail investors from misleading advice.

Rationale: The rise of unregulated finfluencers promoting biased financial products raised concerns about investor safety.

Impact on Fintechs:

- **Marketing Adjustments:** Platforms reliant on influencer-driven marketing faced higher customer acquisition costs.
- **Brand Trust:** Enhanced trust among users due to stricter compliance measures.

Industry Reactions: Nithin Kamath: Supported the move but noted implementation challenges. Gautam Madhavan, CEO of Mad Influence: "This will reduce ad spends on unregistered influencers but promote transparency."

Response by Fintechs: Companies shifted focus to in-house educational initiatives and partnerships with certified advisors for client engagement.



SEBI Introduces Regulation

Balancing Retail Investor Protection and Industry Impact



Stricter SME IPO Norms (Effective Dec 31, 2024)

Details: SEBI tightened SME IPO regulations by mandating profitability requirements and restricting the use of IPO proceeds for related-party loans. Promoters' ability to offload shares was also capped.

Rationale: The move aimed to improve transparency and ensure only financially sound SMEs accessed public markets.

Impact on Fintechs:

- Reduced Activity: Lower SME IPO volumes affected platforms specializing in this segment.
- Investor Confidence: Improved governance standards attracted more institutional participation.

Industry Reactions: SME-focused fintech platforms welcomed the regulation but expressed concerns about reduced IPO volumes.

Response by Fintechs: Platforms diversified offerings beyond SME investments while advocating for balanced regulations that supported growth without stifling innovation.



Algorithmic Trading Regulations (Proposed Implementation in Mar 2025)

Details: SEBI proposed stricter norms for algorithmic trading (algo trading), requiring all third-party algo strategies used by retail investors to be approved by exchanges. Algo providers must register as investment advisors or research analysts and validate performance claims through a Performance Validation Agency (PVA).

Rationale: The regulation aims to curb misuse of algo trading tools that promise unrealistic returns and ensure market integrity through greater transparency and oversight.

Impact on Fintechs:

- Compliance Costs: Increased regulatory scrutiny raised operational costs for brokers offering algo services.
- Market Credibility: Enhanced oversight boosted investor confidence but limited flexibility for smaller algo providers.

Industry Reactions: Tejas Khoday, CEO of FYERS: "The new rules make algo trading more compliance-oriented but operationally cumbersome for brokers." Feroze Azeez, Deputy CEO at Anand Rathi Wealth Limited: "The creation of PaRRVA will bring much-needed credibility to algo strategies while protecting retail investors."

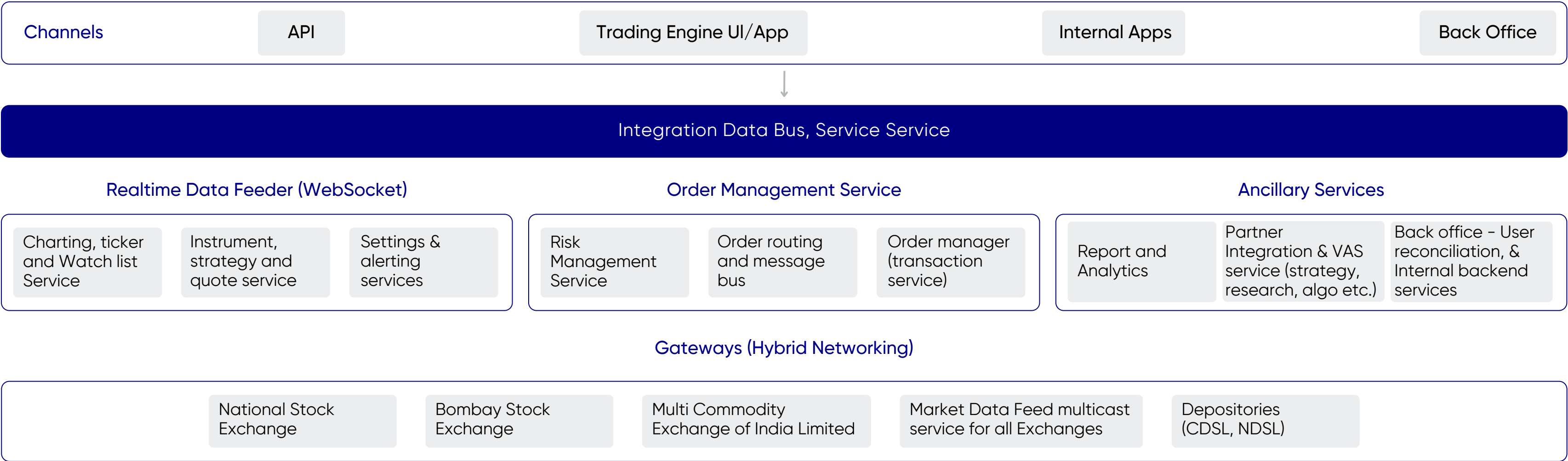
Response by Fintechs: Platforms began building proprietary strategies compliant with SEBI norms while educating clients about realistic expectations from algo trading services.



Discount Broking Functional Flow



Break down services into components to reduce risk and increase flexibility



The discount broking functional flow diagram presents a comprehensive architecture for modern trading platforms, leveraging cloud technologies to provide a robust and scalable system. At the top level, the platform offers multiple channels for user interaction, including APIs for programmatic access, a Trading Engine UI/App for direct user engagement, Internal Apps for operational tasks, and Back Office systems for administrative functions. These diverse entry points ensure flexibility and cater to various user needs.

Central to the architecture is the Integration Data Bus and Security Service, which acts as the backbone of the system. This component facilitates seamless data flow between different modules while maintaining security protocols, crucial for handling sensitive financial transactions. The Realtime Data Feeder, utilizing WebSocket technology, ensures that users receive up-to-the-second market data, essential for making informed trading decisions.

Discount Broking Functional Flow



The Order Management Service forms the core of the trading functionality. It encompasses Risk Management Services to safeguard against excessive market exposure, Order Routing and Message Bus for efficient order processing, and an Order Manager for handling transactional details. This multi-layered approach ensures both speed and reliability in low latency order execution.

Supporting these primary functions are Ancillary Services, which include features like Charting, Ticker, and Watch List Services for market analysis, Instrument Strategy and Quote Services for advanced trading strategies, and Settings & Alerting Services for personalized user experiences. The platform also incorporates Partner Integration, Reporting, and Analytics capabilities, along with Back Office services for user reconciliation and internal operations.

At the foundation of this architecture lies the Gateways layer, implementing Hybrid Networking. This layer interfaces with critical external entities such as the National Stock Exchange, Bombay Stock Exchange, Multi Commodity Exchange of India Limited, and various data feed and depository services. The hybrid high performance networking approach combines on-premises infrastructure with cloud services, optimizing for both performance and cost-effectiveness.

This comprehensive architecture, built on AWS infrastructure, demonstrates a modular, low latency, highly available, secured and scalable approach to discount broking platforms. By breaking down services into components, the system reduces risk and increases flexibility, reduces blast radius, allowing for easier updates, maintenance, and scaling as market demands evolve.

Interview with Dhan



Alok Pandey

Co founder & CTO

Can you explain Dhan's business model and how it is structured to benefit both the company and its users?

Dhan is a Stock Trading & Investing platform built for Super Traders and Long-Term Investors. The company's founding principles are User Centricity and Tech-Led Innovation, both of which are paramount in this day and age.

India boasts Asia's oldest stock exchange with the Bombay Stock Exchange starting back in 1875, the participation of retail investors has boomed only in recent times. The business itself has transformed from traditional brokerage models centered around stock exchanges, then distribution via sub-brokers, later picked up by banks who had affiliated broking and securities businesses to discount brokers who came up in the last decade.

We believe the future of stock broking is a combination of Product, Technology, and Customer Experience - all pillars are the foundation of starting Dhan. India has seen tailwinds for rapid economic progress via rapid adoption of Digital Public Infrastructure (DPI) rails like Aadhaar, UPI, eSign, KRAs and more - which has resulted in India now having 15 Crore demat accounts, a majority of them have started in the past 3 years post Covid-19.

Dhan in its journey till date has launched multiple platforms including its flagship product Dhan, Options Trader for traders focussed on the F&O segment, ScanX - a detailed screener for Indian Markets to discover investing & trading opportunities, TradingView console by Dhan for charting, and its API platform DhanHQ for users who are systematic and algo traders. Dhan offers all of the above to its customers at industry-standard pricing.

Dhan was launched on 4th November 2021, and ever since has grown based on its focus on Product, Technology and Customer Experience. We have been named the fastest-growing Stock Trading product in 2024 by Moneycontrol, and moved from rank #300 to be ranked among the Top 12 Stock Broking platforms based on active clients by NSE.

Interview with Dhan



What sets Dhan apart from other online stock trading and investing platforms in India? How do you ensure a unique value proposition for your users?

Stock Broking is a highly competitive business and also a very commoditised one. Dhan is one of the last entrants to the industry and has been able to show its mark by constantly innovating based on the feedback and suggestions from its users.

In a business that is competitive, Dhan chooses not to compete on pricing but on the principle of offering great value for money to its users at industry standard prices. In less than 3 years we have launched 6+ products with 50+ industry-first features. We are the first broker in India to partner with TradingView to bring innovations in charting and trading experience, first app to offer customer strategy builder and lots more! The true differentiator lies in product experience, the feeling a person gets when they place their first order or open a chart to analyse a stock. That feeling sticks, and translates to better retention and acquisition through referrals.

Moreover, our users know for a fact that Dhan is the platform for trading and investing (captured wonderfully through our brand tagline #MadeForTrade), backed by reliable order execution.

So, we believe in three things that differentiate us from the competition, as summary: User Centricity, Product Experience, and Continuous Innovation. These founding principles serve as our differentiator in the crowded fintech market, as we stepped in to listen and understand what lakhs of traders and investors needed. And with that, we have built Dhan.

How do current regulations affect Dhan's operations and growth? Are there any regulatory challenges that you foresee in the near future?

India continues to be one of the brightest spots among emerging markets and is set to become a major economic power in the years to come. With the expected growth of the Indian economy, it is also expected that participation in Indian stock markets will further increase – directly via Stock Markets or indirectly through Mutual Funds.

Regulations in India have been far more progressive and at the same time have nurtured innovation on the back of many developments that have been enabled with Digital Public Infrastructure. We have seen massive growth across all financial sectors – Payments, Banking, Insurance, Investing and Wealth.

With growing retail participation, the regulations have also evolved to remove any systematic risks from the economy as well as safeguard the interests of retail investors and market participants. Those who've been observing these regulations over time know that the landscape is ever-changing, so there may be few implications in the short term, all in the interest of market participants however we feel that they will only nurture future growth in years to come.

At Dhan, we continue to operate with our focus on customers and build our product roadmap to serve the needs of Super Traders and Long-Term Investors.

Interview with Dhan



How does Dhan leverage technology to improve scalability and reduce latency in trading operations? Can you share any specific technological innovations or partnerships that have been pivotal?

Stock Trading Platforms are one of the most complicated systems out there in the financial services landscape. A lot of things need to be in place – internally and externally for the trading platforms to work seamlessly and give the traders the best possible experience. That’s what we strive for every day at Dhan.

We understand that users on Dhan are power traders – what we refer to as Super Traders. They care a lot about faster speed of execution, low or nil slippages, ability to manage positions swiftly and seamlessly with the need to get in or get out of markets within a flash of second. Traders not only need accurate pricing across systems – but also need lots of insights and derived analytics for evaluating trading opportunities. We Dhan are one of the very few brokers who manage complete technology setup – including development, deployment, and management of products and platforms in-house including complex management of networks, connectivity, and infrastructure.

Among the Stock Brokers who have launched operations in the last 15 years, Dhan is the only stockbroker to own and manage our entire technology infrastructure, including core trading systems, in-house! This is made possible by DEXT or Dhan Exchange Trading System, our proprietary in-house trading system built using the latest technology stack (Golang, Redis, Rabbitmq, Flutter, Clickhouse, & more).

DEXT ensures that more than 85% of all trades are processed in under 25 milliseconds, 4X-5X faster than the typical industry averages of 80-120 milliseconds. Meanwhile, we pride ourselves on the fact that 100% of all Exchange Orders on Dhan go through our own trading system. We also have an Active-Active Disaster Recovery system, which means we connect with Stock Exchanges via both primary and secondary infrastructure simultaneously and distribute our traffic as well as trades through different zones and yet are able to drive industry-best performance in the execution of trades.

Our entire infrastructure and core trading systems are monitored in real time by a dedicated team of top-notch engineers using custom dashboards and systems to minimize and resolve downtime instantly. Dhan teams also have the latest observability stack, build grounds-up with a voice-assistance to signal, and highlight important occurrences on system observability as well market fluctuations & traffic monitoring.

Interview with Dhan



Is Dhan utilizing generative AI in its services or operations? If so, how is it being implemented to enhance user experience or improve operational efficiency?

Our team at Dhan loves to solve problems with use of technology and believes in staying at the forefront of innovation to serve our users with the best possible product experience or improve the efficiency of internal processes that help us build a great customer experience. To this end, our team has been leveraging AI to enhance every user's experience across the lifecycle of our users.

At the customer support level, we've developed an AI Assistant who interfaces with users via chat to address their queries. This helps us drive towards swift resolutions while curtailing the TAT for every response.

Furthermore, we've introduced transcription for voice calls to improve post-call analytics, powered by Automated Assistant which helps us understand if our teams are able to deliver the right experience to our users when they interact with us via our help desks.

In addition to this, being a growing stock trading platform - we welcome thousands of traders to our platform every day which also means we complete their KYC and onboarding process, and a lot of these automations are done via AI Automations, many built on top of AI resources provided by AWS.

We believe GenAI's role in all of this is crucial, but this is just the tip of the iceberg for us. We have many more innovations using AI planned for the near future.

In your opinion, what does the future hold for stock brokerage companies in India? How is Dhan preparing to adapt to these future trends?

The future of the Stock Brokerage industry is going to be very different from what it seems today. We have already leaped ahead in the past decade and now the Stock Trading business is more like a Technology & Product-led business - unlike what it used to be a few years ago.

The advent of technology in AI and LLM models, the reaction of markets to events and business performance, the increased participation of retail users directly or indirectly, and the ever-evolving regulatory landscape - all make us want to believe that the future of Stock Broking will be further driven by technology than ever before.

We're already in the process of innovating faster and better to incorporate modern technology into our products and overall ecosystem as we prepare ourselves for the future.

Interview with Dhan



How does Dhan incorporate user feedback into its platform development? Can you share any recent updates or features that were directly influenced by user input?

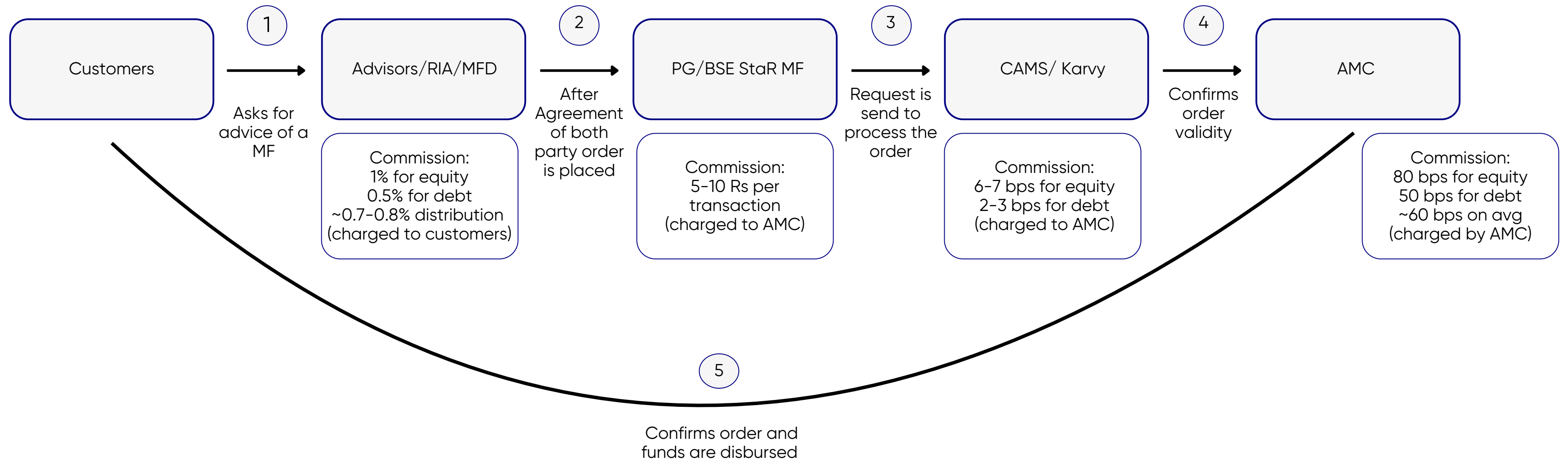
Every user's role in the Dhan ecosystem can not be emphasized enough. Their feedback, suggestions, and insights are a window into the real world, and the real issues faced by traders and investors.

We use these nuggets of wisdom to build with our users, a platform for our users. In fact, there's a term for it that we love - community-led building. It's been our focus from day 1 and over 80% of features we've built are requested by our community. Some recent examples of these include Alerts on Charts, Scalping on Charts, Set Order Preferences, Margin Trading Facility, Options Trading from TradingView.com, and many more!

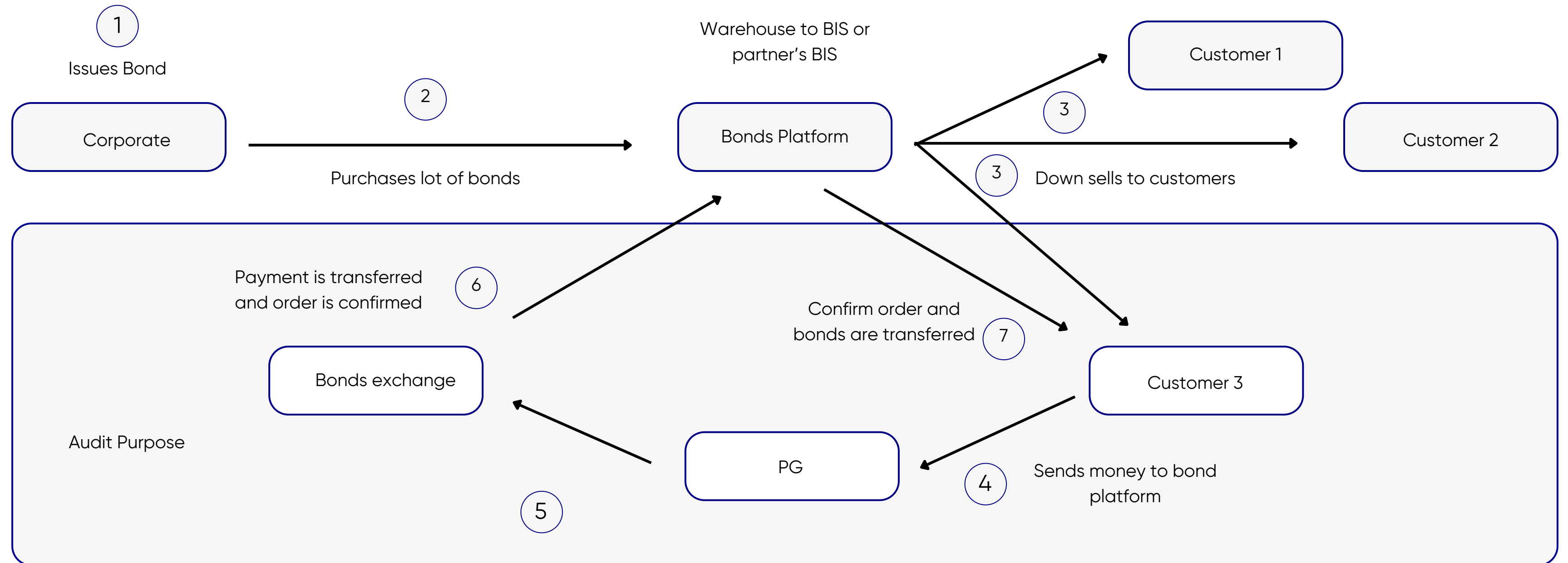
While we have a thriving online community, we also regularly meet our users at our Mumbai office to beta test new products, discuss market trends, and educate them to trade and invest safely.

From day one, we have built Dhan with our users and we will continue building with them.

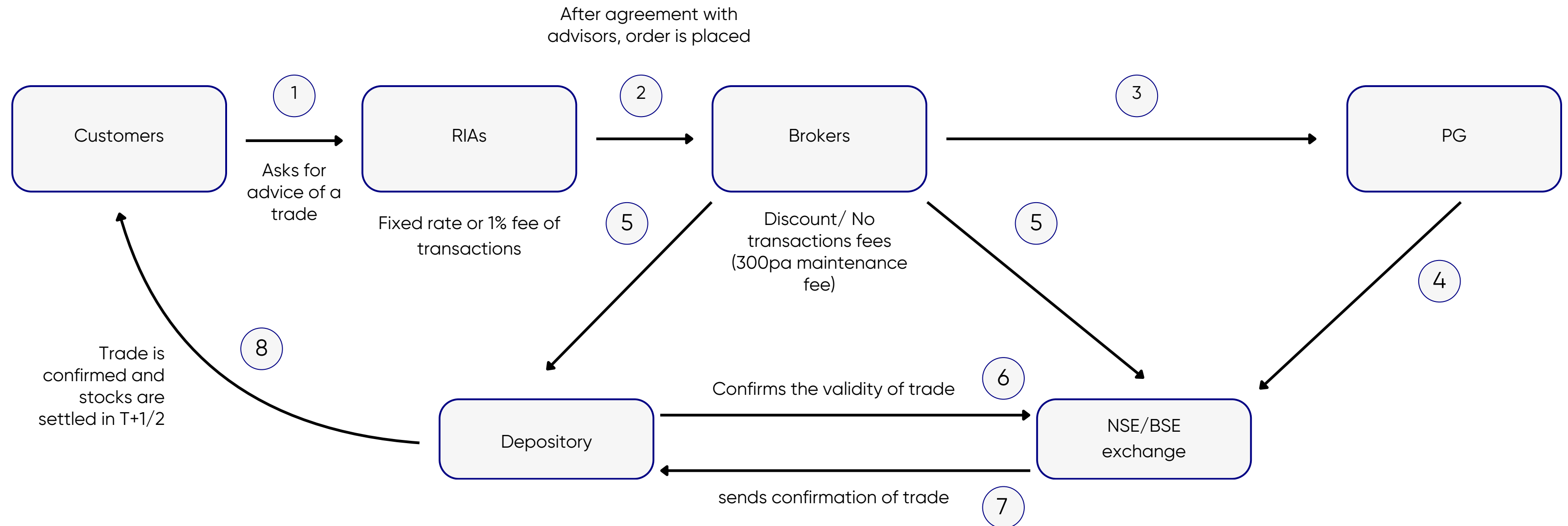
Value Chain Analysis: Robo Advisory/MF



Value Chain Analysis: Bonds



Value Chain Analysis: RIAs



Certain Investment Products not Allowed in India



Investment Products	Regulatory Challenges and why such product has not been allowed	Outside India
Fractionalisation of Shares	Fractional shares are prohibited from being purchased, sold, or traded in India due to Section 4(1)(e) (i) of the Companies Act, 2013 ("Companies Act") wherein the number of shares to which the subscribers to the memorandum of association agree to subscribe cannot not be less than one share. Furthermore, para 4 of Table F provided under Schedule I to the Companies Act prohibits the recognition of any interest in any fractional part of a share. However, a Company Law Committee (CLC) Report of March 2022 has put forward recommendations to insert provisions that enable issuance, holding and transfer of fractional shares within the Companies Act. 1 Additionally, the Securities and Exchange Board of India ("SEBI") has expressed on multiple occasions, the intention to allow the same subject to the requisite changes being made in the Companies Act. 2	<p>In the US, fractional shares have been around for a while. It is interesting to note that US companies also do not issue fractional shares.</p> <p>In US, when an investor places an order to buy a stock, they can specify the dollar amount they want to invest rather than the number of shares they want to purchase. The brokerage platform calculates the fractional share amount based on the specified dollar amount and the current share price. The brokerage platform will hold the shares under the <u>street name</u>. The street name concept allows the broker-dealers to own stocks in their own name and enables them to pass a "book-entry" for which the client is the beneficiary as per its records.</p> <p>In India, investors cannot own fractional shares in the same way. This is because, in India, brokers cannot have shares in their name. So they cannot act as dealers and distribute fractional shares.</p>
Crowdfunding	<p>Crowdfunding can be sub-categorized into:</p> <ol style="list-style-type: none">1.Donation-based: SEBI issued a 'Framework on Social Stock Exchange' wherein donation-based crowdfunding is allowed, within a regulatory framework governed by SEBI. 3 This regulatory framework encourages social enterprises to align with the social stock exchange framework.2.Peer-to-Peer lending: Reserve Bank of India ("RBI") issued the Master Directions – Non-Banking Financial Company – Peer to Peer Lending Platform (Reserve Bank) Directions, 2017 4 that lays down the regulatory framework within which peer-to-peer lending may operate.3.Equity based: Such raising of capital is governed by the private placement norms under the Section 42 of the Companies Act read with the Companies (Prospectus and Allotment of Securities) Rules, 2014. Private placement norms mandate that the offer or invitation to subscribe to securities under private placement cannot exceed 200 persons in aggregate in a financial year. Also, public advertisements or use of any media, marketing or distribution channels or agents to inform the public at large about such an issue is prohibited. Moreover, the offer can only be made to persons who are specifically identified by the company prior to making such an offer. <p>Thus, while equity crowd funding is allowed, the restrictions under Section 42 are significant regulatory challenges affecting the viability of crowdfunding businesses of this form.</p>	<p>Since the days of SEBI's consultation paper on crowdfunding in India back in 2014, the regulator has been concerned with companies misusing the private placement route to issue a huge number of optional/compulsory convertible debt securities to public under the garb of private placements. While SEBI has acknowledged the usefulness of the crowdfunding model, it has still been wary of the same considering a lack of regulatory framework oversight and potential for investor abuse. However, it has been almost a decade and the regulator seems nowhere close to coming up with a viable framework for crowdfunding.</p> <p>Given that the regulator has always been focused on consumer protection – Crowdfunding involves a large number of possibly non-sophisticated investors, in an early-stage company which has a high chance of failure along with information asymmetry, transparency and illiquidity. Prominent Cases: The Sahara Case</p> <p>Further, it is interesting to note that in different jurisdiction there's either a cap on the amount of investment or on percentage of one's net-worth, and other similar restrictions are there etc.</p>

Certain Investment Products not Allowed in India



Investment Products	Regulatory Challenges and why such product has not been allowed	Outside India
Weather Based Investments	The Ministry of Finance has expanded the list of commodities permitted for derivatives trading to include weather under the Securities Contracts (Regulation) Act, 1956 ("SCRA"). 5 SEBI has also issued a circular to the same effect. 6	NA
Tokenization of assets	<p>India does not currently have a specific legislation on regulation of Virtual Digital Assets ("VDAs") making it difficult to ascertain the legal characterization of Asset Tokens in India. Amendments in the Prevention of Money-Laundering Act, 2022 ("PMLA") and subsequent guidelines by Financial Intelligence Unit, India ("FIU-IND") only mandate registration and prescribe certain disclosure, reporting and monitoring obligations on entities engaged in notified activities relating to VDAs. Therefore, there is a lack of guidelines on issuance of VDAs.</p> <p>Additionally, the recognition of digital ledger contracts as valid contracts within the Indian Contracts Act, 1972 ("Contracts Act") and ambiguity regarding asset tokens being classified as 'securities' under Section 2(h) of SCRA are additional challenges.</p> <p>However, International Financial Services Centres Authority ("IFSCA") has announced its intention to come up with regulations and policy guidelines governing a blockchain based product. Pursuant to this, IFSCA formed a committee to develop regulations for the tokenisation of real and physical assets and examine the legal validity of smart contracts. 7</p>	<p>It is interesting to note that Terazo has launched tokenisation of the real estate asset in India under the regulatory sandbox framework established by the International Financial Services Centres Authority (IFSCA).</p> <p>Asset tokenisation has been launched for real estate and going forward we may see other asset classes such as art works, precious metals, luxury objects may also be allowed by IFSCA.</p> <p>Though cryptocurrencies and tokenized assets both rely on tokens and distributed ledger technology (DLT), the key difference between the two types of tokens is what they represent. Cryptocurrencies generally do not have any particular asset backing them, while tokenization of traditional assets is meant to use a token to represent a claim to a particular asset or right that has a verifiable value.</p>
Litigation Financing	<p>Litigation funding is unregulated in India. Accordingly, the general principles of contract law under the Contract Act will apply including, inter alia, Section 23 that provides that a contract which is opposed to public policy may be deemed void. Judicial precedents indicate its permissibility, albeit with certain caveats and conditions especially pertaining to the requirement for bona-fide intent behind financing. Thus, litigation financing as an investment product may face issues as such agreements may be deemed void due to being violative of public policy.</p> <p>However, recently a few start-ups in India have introduced the concept of litigation financing in the form of an alternative investment. Currently, two forms of legal financing solutions are available: interim finance and litigation finance. It remains to be seen how the regulatory authorities view such investments, and whether any guardrails are imposed in this behalf.</p>	<p>In U.S.A., lawyers are permitted to fund the entire litigation and take their fee as a percentage of the proceeds if they win the case.</p> <p>However, In 2018, India's Supreme Court, in Bar Council of India v. AK. Balaji [(2018) 5 SCC 379] observed that:</p> <p>"In India, funding of litigation by advocates is not explicitly prohibited, but a conjoint reading of Rule 18 (fomenting litigation), Rule 20 (contingency fees), Rule 21 (share or interest in an actionable claim) and Rule 22 (participating in bids in execution, etc.) would strongly suggest that advocates in India cannot fund litigation on behalf of their clients. There appears to be no restriction on third parties (non-lawyers) funding the litigation and getting repaid after the outcome of the litigation. In Asia, Singapore and Hong Kong have accepted Third Party Financing, but have confined and restricted it to disputes related to international arbitration.</p>

Emerging Trends



Particulars	Social Stock Exchange	Carbon Trade Exchange	MSME REITs	RWA Tokenization
Business Model	A social stock exchange is a platform where social enterprises/organizations can raise funds from the public. SSE will be segment on stock exchange- NSE and BSE where Not-for-Profit Organizations (NPOs) and For Profit Social Enterprises (FPEs) be listed.	Carbon Credit Trading System (CCTS) is an exchange system where obligated as well non obligated can trade carbon credits (allowance of 1 ton equivalent of GHG emissions for company). Companies will be given credits on the basis of industry, scale, green and renewable initiatives and other, and they can trade the credits above their actual emissions. Such system are notably influenced by international agreements such as the Kyoto Protocol and the Paris Agreement	A Real Estate Investment Trust (REIT) is a type of security that allows investors to invest in real estate properties, similar to mutual funds. It offers investors regular income, portfolio diversification, and long-term capital appreciation by allowing them to own a part of property. MSME REITs, a newly proposed category, aim to facilitate investment in small and medium-sized properties, enhancing liquidity and investment opportunities in real estate.	RWA Tokenisation is a method using which real world assets such as cards, house, stocks, metals are converted into tokens with all necessity data and made available to blockchain to increase the liquidity and accessibility. It Is the method using which decentralized finance (De-Fi) is being introduced to traditional finance
Benefits	<ol style="list-style-type: none">1.Alternate funding mechanism, reducing reliance on traditional donors2.Retails investors institutional investors, and impact investors will be able to contribute to social impact3.Social Impact and Sustainability market will grow faster4.The Annual Impact Report, will help bring more transparency and confidence in the market	<ol style="list-style-type: none">1.An incentive for company to shift to green technology and limit their emissions2.Will boost and support green tech startups3.Companies exceeding the limit need to buy credit which results in self positive punishment mechanism	<ol style="list-style-type: none">1.Helps investors gain long term capital appreciation and portfolio diversification2.Investors can own a part of various properties without restricting to one property or managing it3.It opens up the market to small investors and small real estate market, thereby supporting growth	<ol style="list-style-type: none">1.Transparency- Public blockchains are auditable in real-time, opening up the ability to verify the quality of asset collateral and systemic risk exposure and mitigates the chances of record manipulation/hiding2.Efficient- Tokens carries the necessary information which results in ease of compliance and removes unnecessary steps for deals.3.Reduced cost- Removal of intermediaries results in cost reduction.
Growth	As of April 2024 51 NPOs are registered on NSE and 9 NPOs have raised funds on SSE of a total pool of 12.4 crore	India currently holds 3rd place after US and China in amount of GHG emissions. Carbon pricing instruments cover around 24% of global emissions.	Current fractional ownership of real estate market in India is estimated to be 500 Million \$	Global market size of tokenized assets is 0.4 trillion \$ as of 2023

Emerging Trends



Particulars	Social Stock Exchange	Carbon Trade Exchange	MSME REITs	RWA Tokenization
Regulations	<ol style="list-style-type: none"> 1.NPOs and FPEs must have atleast two third of their average revenue/expenses/targeted customers base should be meant towards providing eligible social activities 2.They must be solving/working on atleast one of themes mentioned by SEBI 3.Annual Impact Report consisting of the work and impact brought as well as description of how money is being utilized should be mentioned. 4.FPE should meet all the commercial entity eligibility criteria and NPOs must be registered as trust/society or a Section 8 Company with some minimum fund raising of 50 lakhs INR 	<p>India is aiming to start CCTS till 2025-26.</p>	<ol style="list-style-type: none"> 1.Minimum Asset Value is 25 Crore INR instead 500 Crore INR for traditional REITs 2.They are not permitted to invest in under-construction or non-rent-generating properties, ensuring a focus on stable income-generating assets 3.The investment manager is required to have a net worth of at least ₹20 crore 	<p>No explicit regulations, the concept is evolving and subject to regulatory scrutiny.</p>
Revenue stream	<ol style="list-style-type: none"> 1.Fundraising Stream are- 2.NPO- Equity, Zero Coupon Zero Principal bonds, Development Impact Bonds, Social Impact Bonds, Donations through mutual funds. 3.FPEs- Equity, debt, Development Impact Bonds, Social Impact bonds. 	<ol style="list-style-type: none"> 1.Companies can trade left over credit to have an extra source of income 2.Brokerage for brokers 3.Revenue through trading of credit for obligated and non-obligated participants 	<ol style="list-style-type: none"> 1.Rental Income 2.Interest Income by buying mortgaging properties 3.Capital gains by selling owned estate 4.Fee and other incomes charged to investors for managing assets 	<ol style="list-style-type: none"> 1.Transaction Fees 2.Subscription Charge 3.Data Analytics
Challenges	<ol style="list-style-type: none"> 1.No standardized metrics to measure the impact created 2.Process of registration and listing can be out of expertise for organizations 3.Creating awareness of social impact and SSE among general public 	<ol style="list-style-type: none"> 1.India currently follows Perform, Achieve and Trade (PAT) scheme and the Renewable Energy Certificates (REC) system. Switching to CCTS will be difficult 2.Regulations need to be made for the exchange system 3.Capturing and measuring the emissions for each obligated body can be very costly and difficult, which can result into 	<ol style="list-style-type: none"> 1.High skepticism regarding this model leads to insufficient funding 	<ol style="list-style-type: none"> 1) Integration with traditional financial and government bodies for nation wide adoption

CYBRILLA

Cybrilla's unbundled architecture opened up untapped customer segments in a 3-decade old industry

Cybrilla is a technology company building digital infrastructure for mutual fund industry. It currently powers 50+ industry players each serving a different segment of investors thereby contributing to the increase of inflow of new investors to the Indian MF industry.

An opportunity to unlock a new investor segment ...

An asset manager through one of his partners, is keen on tapping into a unique underserved investor segment who have never invested in financial markets. The investment journey for these users have to be tailor made to suit their lifestyle by embedding the journey within the user's e-commerce shopping experience.

This use case, among other things, needs the following

Investment through a Daily SIP for ultra short term goals eg. buying a watch

This use case needs the ability to setup SIP without a payment mandate and then have the flexibility in doing instalment payments through different methods. This is needed because of the penalties involved in auto debit failures (not having enough bank balance is a common scenario among the users in this group). Incumbent systems doesn't allow an SIP to be registered without an upfront payment mandate. This rigidity is a blocker for the use case to function

Problem 1

One-size fits all approach resulting in no/low options for customizations

Embed the investment journey into e-commerce shopping workflow - To blend seamlessly into the user's e-commerce shopping experience - onboarding, order placement and payment collection has to be separate workflows so they can be embedded at appropriate places in the buying journey. In traditional systems, these workflows are stitched together to execute sequentially, which defeats our use case.

Solution

A thoughtful team of developers and product managers

Consumed by the same frustration experiencing the rigidity of incumbent systems, Cybrilla's team has taken an unbundled architecture approach to solve this problem. It has broken down the end to end investment journey into granular pieces covering profiling, kyc, onboarding, orders, payments, reporting, without being opinionated on the design of the investment journeys, giving rise to composability and infinite possibilities. Since these primitives can be consumed independently, embedding them into an existing journey and flexibility of registering the SIPs is possible.

Problem 2

Bundled architecture resulting in rigid workflows

Serving new segments require new workflows – the current systems available doesn’t allow him to design new investment journeys leading to frustration because of the lost opportunity. A similar story exists for a lot of other innovators who eventually end up with unhappy users and a dead end.

Solution

Unbundled Architecture First principles thinking on

MF domain → *resulting in* → Functional Granularity → *resulting in* → Composability of new investment journeys

Impact Created

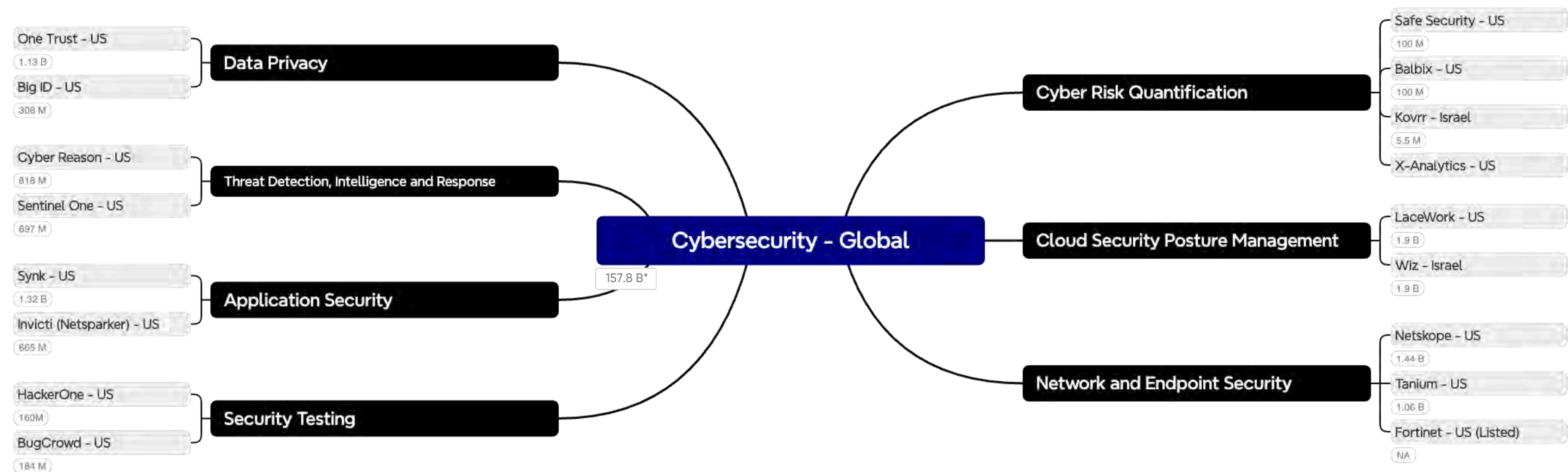
Cybrilla, by working on the foundational principles has created impact at multiple levels

5+ new untapped investor segments opened up	~ 90% time and resources spent on setup and operational activity is now directed towards business development	Enabled the industry players to adopt unbundling approach to their problem solving
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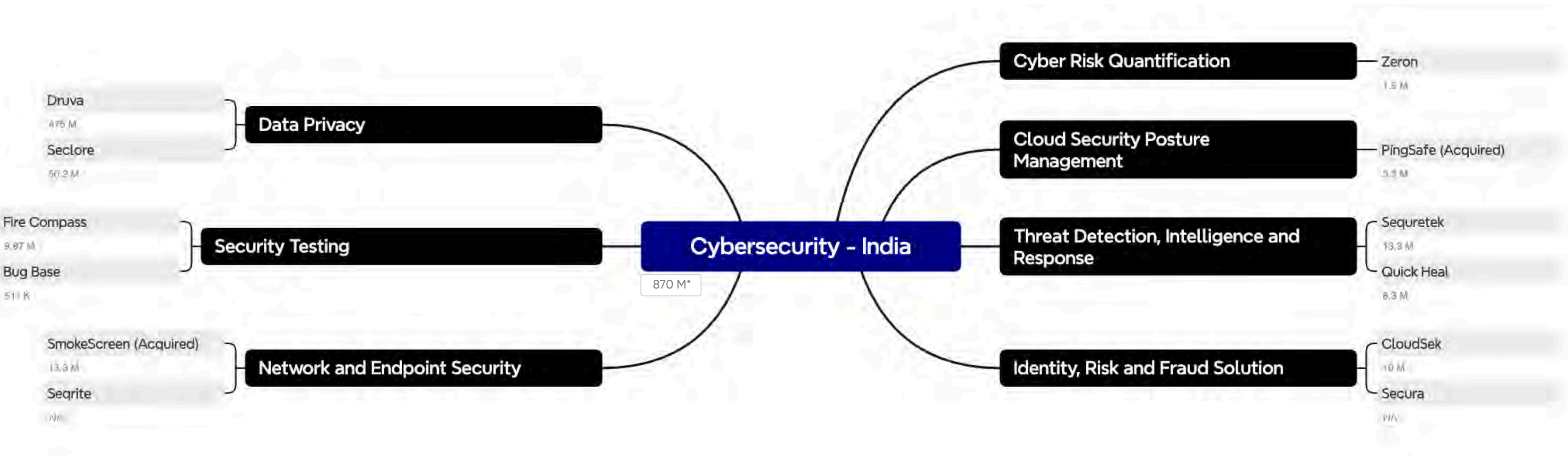


Cyber Security

Global Mindmap



* Funding Period from 2015 - 2024
Source: Tracxn, Varanium Research



Global Cyber Security



Segment	Total Addressable Market (Billion \$)	Explanation	Notable Companies
Data protection	50-100	Helps companies safeguard sensitive information such as PII and ensures integrity, confidentiality and availability of data and protects from attacks and corruptions	Data protection
Governance, risk and compliance	50-100	GRC providers offer integrated solutions that combine governance, risk management, and compliance capabilities to help organizations operate efficiently, manage risks effectively, and adhere to regulatory requirements.	India- Riskpro, QRC Global- OneTrust, RSA Archer
Email security and awareness	50-100	Protects from various attacks such as phishing, avoids spams, ensure confidential files are transferred within or outside company and avoids malware	India- Bigrock Global- Emailage
Cloud security	50-100	Helps converting data and infra to cloud and offer a range of technologies, policies, and services designed to protect cloud-based data, applications, and infrastructure from various threats.	India- Pingsafe Global- Feeedzai, Orca, Prisma
Network security	50-100	Provides security to your network system and ensures compliance and avoids any breach which other party of your network is affected by	India- Cyberoam Global- Perimeter 81, CISCO, Palo Alto
Identity and access management	50-100	Helps in maintaining and protecting digital identity of individuals and ensures access to data are provided only to authorized and based on hierarchy	India- Idfy Global- Civic Technologies, Okta, Ping Identity
Security consulting	100-200	Test and evaluates companies security infrastructure and guides to improve it	India - CyRAACs, Infosys Global - Kyndryl, IBM, Delloitte, KPMG

Global Cyber Security



Segment	Total Addressable Market (Billion \$)	Explanation	Notable Companies
Web security	100-200	Safeguards networks, servers, and computer systems from malicious attacks and unauthorized access. Their primary objective is to inspect and control web traffic, ensuring the security and integrity of data transmitted over the internet.	India- Indusface Global- Sanctum, Cloudflare
IOT/OT	100-200	Providers helps secure data among various devices and safeguard the entire system from attacks	India- Redinent Global- Armis Security
End point security	100-200	Their primary goal is to detect, prevent, and respond to security threats that target these entry points (laptops, servers, mobile phones) to an organization's network.	India- Quickheal Global- Acronis, SentinelOne, Crowdstrike
Application security	100-200	Provides an overall set of features and products to secure application from any attack and protects data	India- protectt.ai Global- appknox
Security and operations management	400-500	A security operations center, or SOC, is a team of IT security professionals that protects the organization by monitoring, detecting, analyzing, and investigating cyber threats.	India - Threatsys Globa - OnionSecurity
MSSP/ outsourcing	400-500	Offer a range of services to organizations, focusing on security operations, monitoring, and incident response. Their primary goal is to safeguard clients' digital assets by providing 24/7 security monitoring, threat detection, and response.	India- ValuePoint, Softcell Global- Kyndrll, Kroll

Cyber Security Market Analysis



	India	Global
Number and Growth in cyber attacks	Currently, on an average 2,807 cyber attacks happens per organisation per week . It is anticipated to increase by 33% Y-O-Y.	Currently, on an average 1,636 cyber attacks happens per organisation per week . It is anticipated to increase by 33% Y-O-Y.
New type of attacks	Credential Stuffing, Ransomware, Supply Chain	Deepfake, Cryptojacking, Business Email Compromise
Avg cost per fraud for company	2.32 Million \$	4.45 Million \$
Company's spending on Cyber % to revenue	2016: 3% of the IT budget 2023: 7% of the IT budget	2016: 5% of the IT budget 2023: 11% of the IT budget
Notable companies	  	   

India has seen a dramatic increase in cyber attacks, with state-sponsored attacks rising by 278% from 2021 to September 2023. Attacks targeting government agencies surged by 460%, while those on startups and SMEs increased by 508% during the same period.

Cyber Security in Fintech

Rise in Cyber Crime, Key Vulnerabilities & Innovative Differences



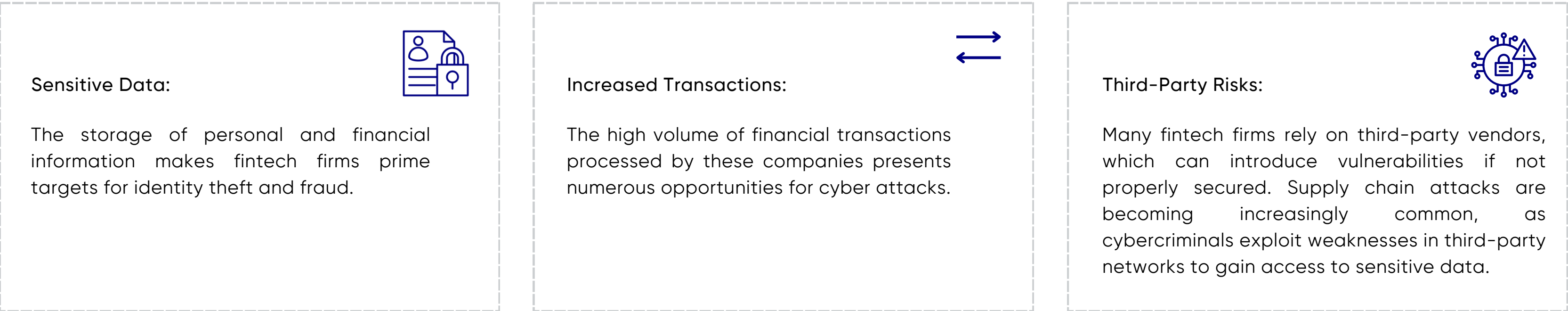
The cybersecurity landscape for fintech companies in India is rapidly evolving, driven by the sector's explosive growth and the increasing sophistication of cyber threats. Here are the key trends and challenges currently shaping this environment:

Surge in Cybercrime

The fintech sector in India has witnessed a dramatic rise in cybercrime, with complaints increasing by 200% in mid-2023, leading to financial losses of approximately ₹168.5 crores. This surge is attributed to the vast amounts of sensitive data handled by fintech firms and the growing reliance on digital transactions. As of 2023, the Indian Computer Emergency Response Team (CERT-In) reported over 429,000 cybersecurity incidents related to financial institutions, a substantial increase from previous years.

Vulnerabilities and Attack Vectors

Fintech companies are particularly attractive targets for cybercriminals due to several factors:



Cyber Security in Fintech

Rise in Cyber Crime, Key Vulnerabilities & Innovative Differences



Cybersecurity Measures and Innovations

In response to these threats, fintech companies are adopting a variety of cybersecurity measures:

AI and Machine Learning

- Many firms are leveraging AI for fraud detection and to simulate cyberattacks, which helps in identifying vulnerabilities proactively.
- AI systems are also being used to analyze vast amounts of transaction data to detect anomalies.

Zero-Trust Architecture:

- There is a growing trend towards implementing zero-trust security models, which assume that threats could be present both inside and outside the network.
- This approach requires continuous verification of users and devices.

Regulatory Compliance

- Compliance with regulations such as the Payment Card Industry Data Security Standards (PCI DSS) and guidelines from the Reserve Bank of India (RBI) is crucial.
- These regulations mandate robust security measures and regular audits to protect customer data.

Challenges in Cybersecurity

Despite these advancements, fintech companies face several challenges:

Digital Literacy:

- A significant portion of the population lacks the necessary digital literacy to understand cybersecurity risks, making them more vulnerable to phishing and other attacks.

Scalability of Security Measures:

- As fintech firms grow, ensuring that their security measures can scale effectively to meet increasing demands is a persistent challenge.

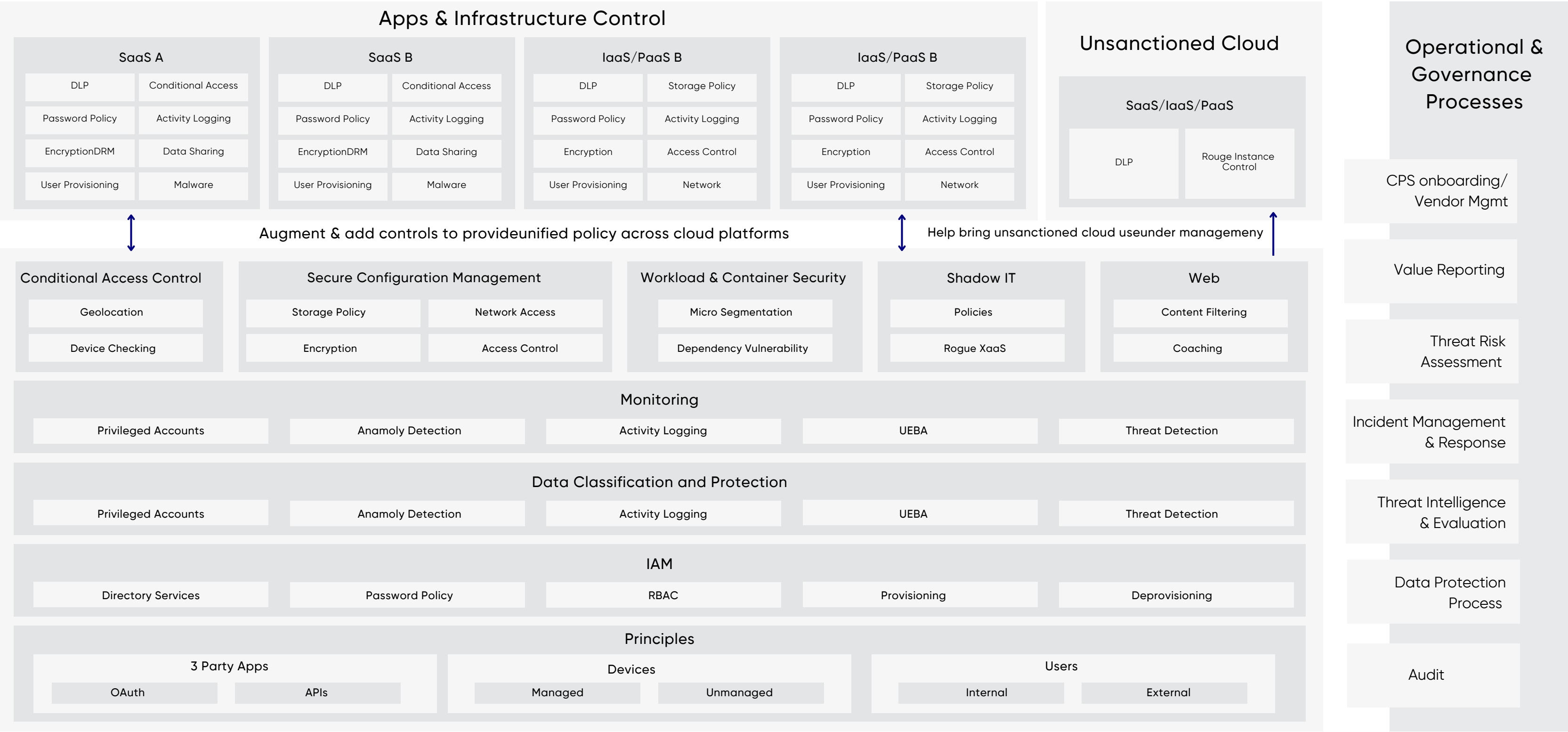
Investment in Cybersecurity:

- Currently, only about 32% of fintech companies prioritize investment in cybersecurity solutions, which can leave many vulnerable to attacks.

Conclusion

The fintech sector in India is at a critical juncture where the rapid advancement of technology must be matched by equally robust cybersecurity measures. As cyber threats become more sophisticated, fintech companies must continue to innovate and invest in security to protect their operations and maintain customer trust. The combination of regulatory compliance, advanced technologies like AI, and a focus on user education will be essential in fortifying the cybersecurity landscape in this dynamic sector.

Tech Architecture



New Type of Cyber Attacks



Type of Cyber Attack	Description	Impact	Attack Vector
AI-Powered Phishing	Utilizes AI to craft highly personalized phishing emails or messages, making them more convincing and harder to detect.	<ul style="list-style-type: none">75% increase in successful phishing attacks in 2023.Average loss per incident: \$5 million.	Email, social media, messaging platforms, voice phishing (vishing).
Deepfake-Based Fraud	Uses deepfake technology to create realistic videos or audio impersonations of executives to authorize fraudulent transactions.	<ul style="list-style-type: none">\$243 million lost globally in 2023 due to deepfake-based fraud.Reputational damage to organizations.	Social engineering via video calls, phone calls, or recorded messages.
Supply Chain Attacks on CI/CD Pipelines	Targeting the Continuous Integration/Continuous Deployment (CI/CD) pipelines of software development processes to inject malicious code.	<ul style="list-style-type: none">400% increase in supply chain attacks from 2020 to 2023.Potential loss: \$10 million per incident.	Compromise of development tools, repositories, and third-party libraries.
Quantum-Resistant Algorithm Exploits	Exploiting vulnerabilities in new, untested quantum-resistant cryptographic algorithms being implemented prematurely.	<ul style="list-style-type: none">Breach of sensitive data encrypted with vulnerable algorithms.Estimated financial loss: \$2 billion by 2025.	Direct attacks on cryptographic protocols and algorithms.
Ransomware 3.0	Advanced ransomware that not only encrypts data but also exfiltrates and threatens to auction it off if ransom is not paid.	<ul style="list-style-type: none">Global ransomware damages reached \$20 billion in 2023.Average ransom demand: \$1.5 million.	Phishing, software vulnerabilities, Remote Desktop Protocol (RDP) exploits.
IoT Botnets in Smart Cities	Hijacking IoT devices in smart city infrastructure to launch large-scale DDoS attacks or disrupt critical services.	<ul style="list-style-type: none">\$50 million in damages due to smart city infrastructure disruptions.30% of smart city projects affected in 2023.	Insecure IoT devices, default credentials, lack of network segmentation.
5G Network Vulnerabilities	Exploiting vulnerabilities in 5G networks to intercept or disrupt communication between devices and services.	<ul style="list-style-type: none">\$1 billion estimated loss due to 5G-related security breaches by 2024.Compromise of critical communication infrastructure.	Network slicing misconfigurations, insufficient encryption, legacy equipment.

Catastrophic Cyber Security Attacks in Recent Times



Cybersecurity

Top US oilfield firm Halliburton hit by cyberattack, source says

By Liz Hampton

August 22, 2024 3:18 AM GMT+5:30 · Updated 2 days ago



Synopsis

Angel One, a Mumbai-based stock broking firm The hacker claimed to have access to the stock holding of customers and their profit and loss statements, too, and that only part of the data has been released till now. Although the company claimed the incident had occurred last year.



In what appears to be a massive [data breach](#), the personal details of [approximately 7.9 million customers of Mumbai-based stock broking firm Angel One](#) were exposed on Tuesday.

From Kotak Life Insurance and IDFC First Bank to State Bank of India and Turtlemint, BFSI is under cyberattack

Sensitive data of these organisations has been compromised on the dark web, which can lead to larger damage if they don't consider strengthening their security infrastructure

BY NAANDIKA TRIPATHI Forbes India Staff

9 min read

PUBLISHED: Jul 14, 2023 01:55:59 PM IST

UPDATED: Jul 18, 2023 03:12:01 PM IST



For a long time, the Banking, financial services and insurance (BFSI) sector has been the chosen target for hackers. Imaging credits: Sushil Mhatre

Forbes

FORBES > LEADERSHIP > CIO NETWORK

UnitedHealth Paid Hackers \$22 Million, Fixes Will Soon Cost Billions

Noah Barsky Contributor @

Noah Barsky writes about business insight in a tech-driven world.

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Apr 30, 2024, 07:00am EDT

Updated Jun 7, 2024, 05:20pm EDT

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Cyber attacks continue to hit critical infrastructure, exposing vulnerabilities in oil, water, healthcare sectors

FEBRUARY 14, 2024



CNBC TV 18 Market Personal Finance Business Economy

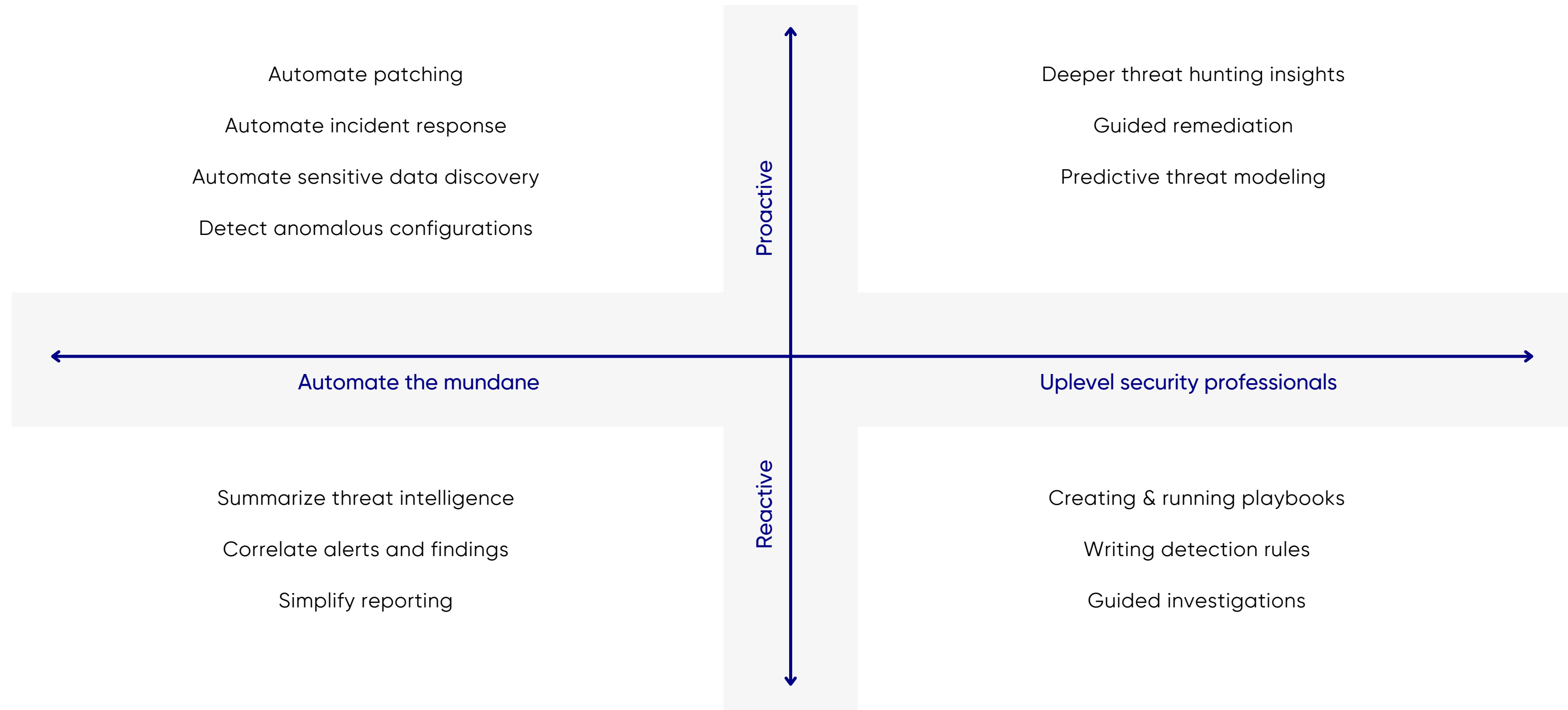
Ransomware attack hits C-Edge Technologies, disrupts payment services for 300 Indian banks

The National Payments Corporation of India (NPCI) has confirmed that C-Edge Technologies, which manages critical systems for numerous cooperative and regional rural banks, has likely been compromised by a ransomware attack. This incident has disrupted several systems operated by the company.



UnitedHealth Group CEO Andrew Witty GETTY IMAGES

How Generative AI can empower Security Teams



Secured Cloud Architecture for Fintech with Zero Trust Architecture



A conceptual [security model](#) and associated set of [mechanisms](#) that focus on providing security controls around digital assets that [do not solely](#) or [fundamentally depend](#) on traditional network controls or network perimeters



Zero Trust aims to move towards a risk-based decision framework to evaluate and enforce access more dynamically.



Zero Trust is not a replacement for security but it is rather an enhancement to existing security policies that an organization is already utilizing.

NIST SP 800-207 Reference for Zero Trust

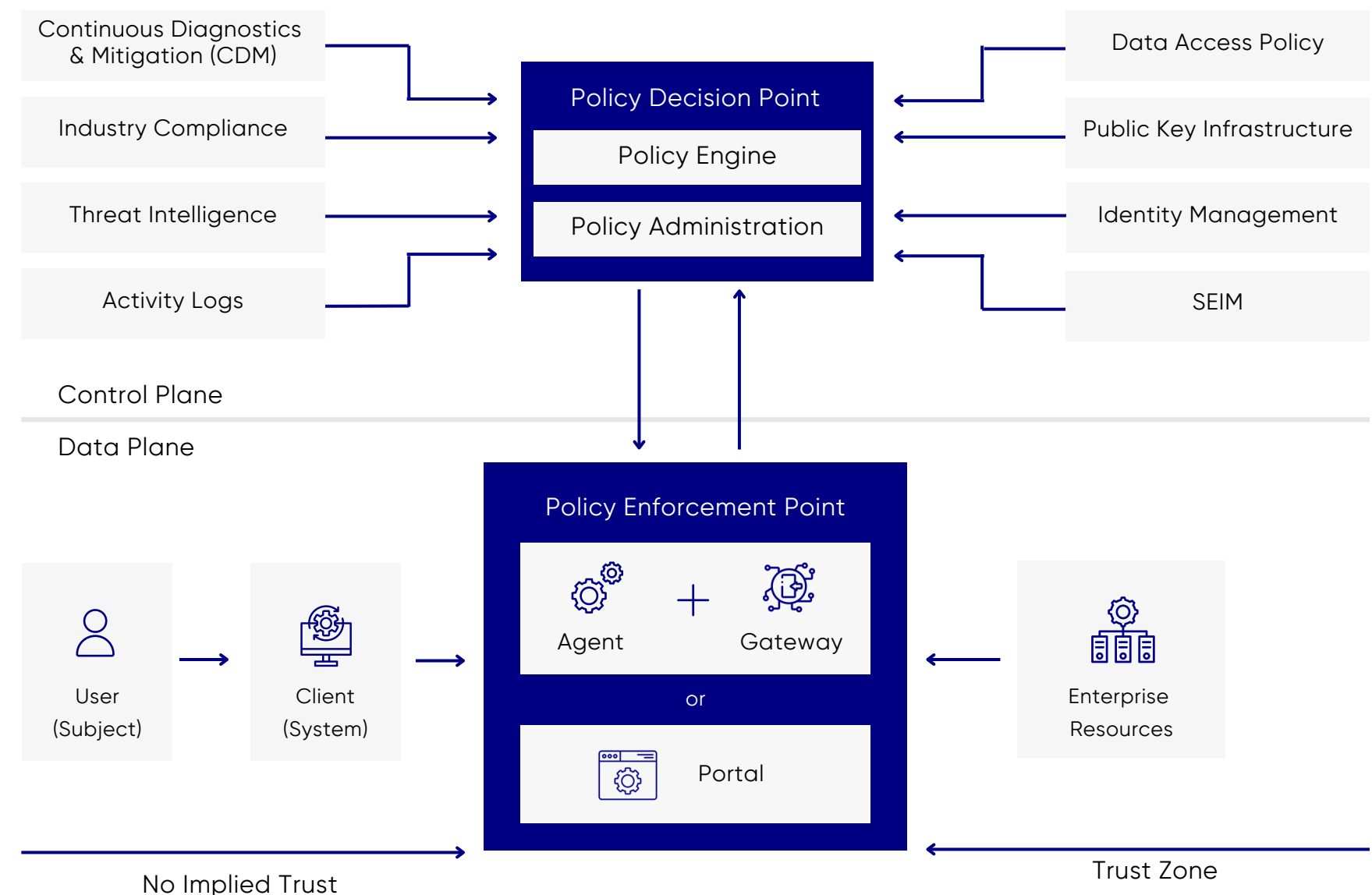
We first want to begin with a baseline understanding of one of the key concepts established by the NIST Special Publication 800-207, namely around policy enforcement and decision points and policy engines. One thing to note is that the policy enforcement point is not necessarily found at a boundary between an internal and external network, but instead placed through an organization's environment.

You can see the split between the data and control planes. This is necessary to create that abstraction layer that separates the logic that governs access to data from the data itself. Another thing to note is that environments today may utilize multiple PDPs/PEPs (Policy Decision Point/Policy Enforcement Point) that are managed separately from one another. However, as solutions evolve we hope to see more solutions with robust integrations that can be managed in a centralized manner with effective orchestration.

This architecture focuses on the crux of the issue, which is the goal to prevent unauthorized access to data and services coupled with making the access control enforcement as granular as possible.

Zero trust provides a set of principles and concepts around moving the Policy Decision Points/Policy Enforcement Points closer to the resource that is being accessed. The idea is to explicitly authenticate and authorize all subjects and assets.

Here we can see a number of inputs that are fed into the PDP and PEP when evaluating access to resources.



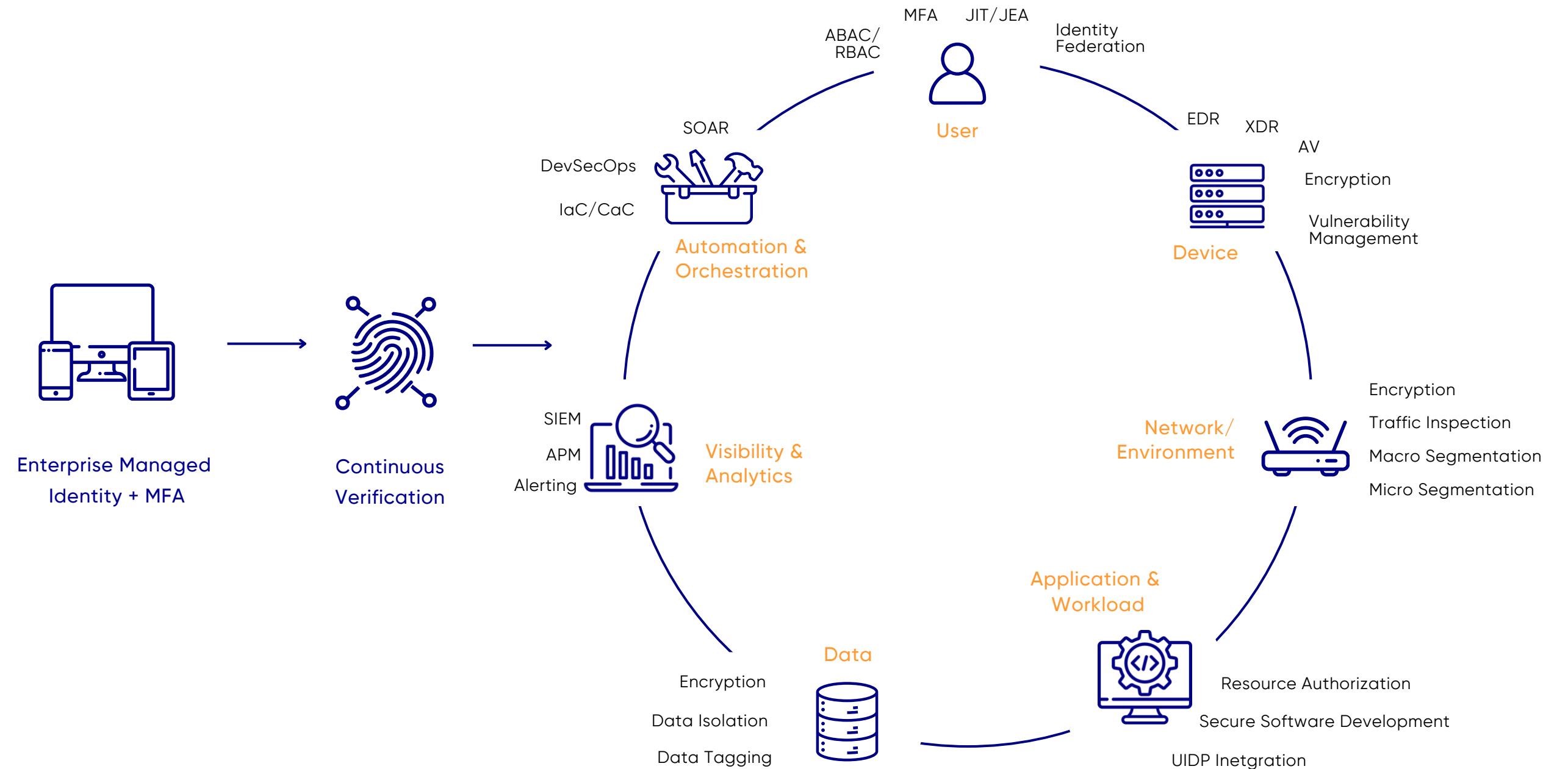
To lessen uncertainties (as they cannot be eliminated), the focus is on authentication, authorization, and shrinking implicit trust zones while maintaining availability and minimizing temporal delays in authentication mechanisms.

AWS Partnered Approach to Zero Trust Pillars & Capabilities



Here, we see 7 pillars of Zero Trust according to the Department of Defense (shown in blue). Each of these pillars are supported by capabilities. The DoD then further breaks down those capabilities into a list of 152 activities, a sample of these activities are shown around the outside of the circle.

In black here, you see one of the central themes of Zero Trust, continuous verification, since it is the cornerstone of a "Never trust, always verify" security model.



AWS Partnered Approach to Zero Trust Pillars & Capabilities



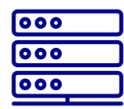
Background:

Biggest to smallest: Pillars – Capabilities – Activities

Please note that these capabilities and activities are non-exhaustive samples.



User, in which AWS offers integrations with its IAM Identity Center with Okta and JumpCloud to leverage their MFA offerings. AWS's ABAC and RBAC capabilities are also key to ZT. [Just-in-time access and Just-enough-administration are available through STS tokens and AWS Session Manager, respectively.]



Device, in which AWS offers its own IoT ZT solutions and partners with best-in-class EDR/XDR, anti-virus, and device encryption vendors. [Depending on the device (IoT or BYOD), vulnerability management might be provided by AWS or a partner.]

1) Supporting FIPS-validated encryption



Network/Environment, in which AWS offers cloud-native micro- and macro-segmentation options and IPsec, MACsec, and HTTPS encryption options. Traffic inspection can occur through a third-party offering, or through Amazon VPC Traffic Mirroring.



Application and Workload, in which AWS provides integration with user identity providers, like Amazon Cognito. Resource authorization can be achieved through AWS resource policies (on S3 buckets, for instance) [and secure software development is an integral part of AWS Code Pipeline and its partners, like HashiCorp Terraform.]

1) AWS's CodePipeline suite integrates with IAM STS, for JIT access.



Data, for which AWS offers tagging capabilities and logical isolation, through resource policies. Data encryption is delivered through AWS Key Management Service (KMS). AWS also partners with DLP and data rights management vendors.



Visibility and Analytics are themes that run through all of the five main pillars and they being with the retention of AWS CloudTrail, AWS CloudWatch, Amazon VPC Flow Logs, and Amazon Route53 DNS logs, all of which can be sent to the SIEM of choice.



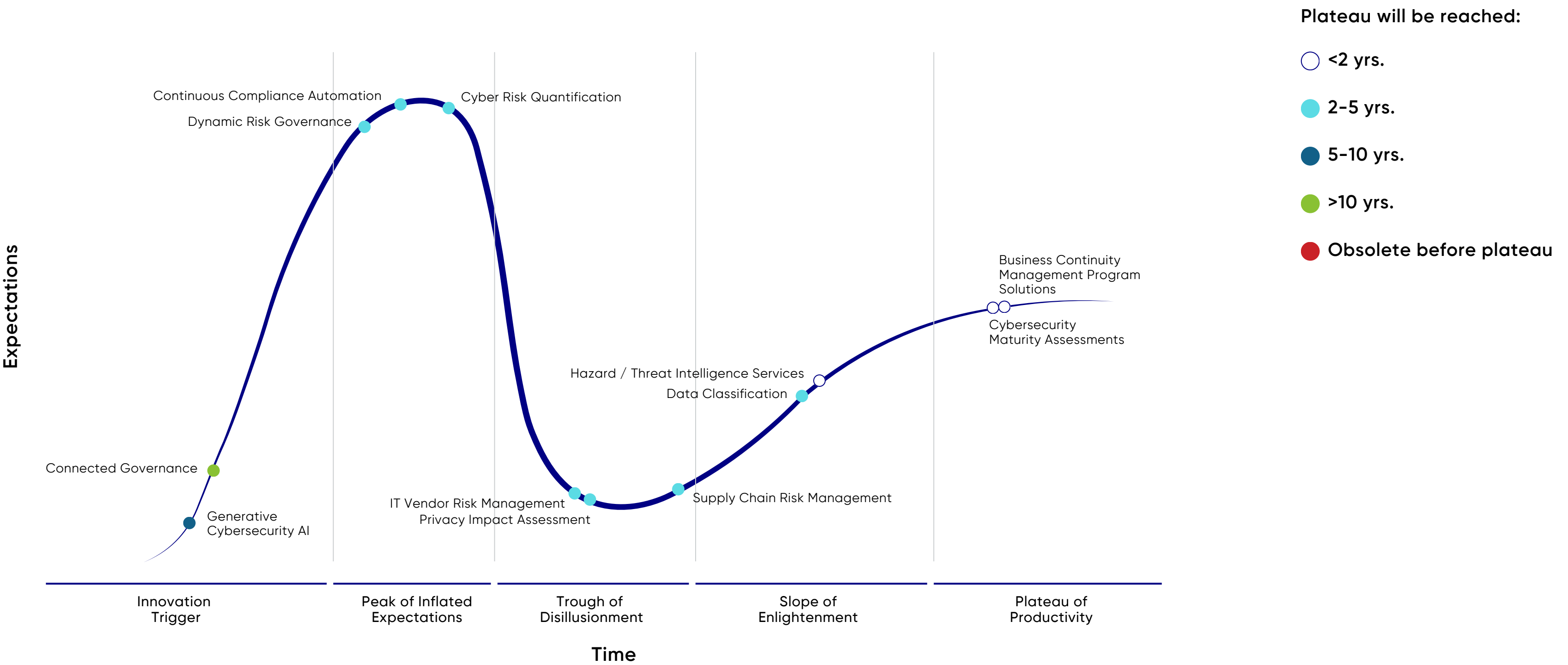
Automation and Orchestration constitute another theme of the five main pillars. Amazon EventBridge, AWS Lambda, and AWS Step Functions are services that can be used to automate remediation flows in any of the five main pillars. Orchestration is also possible through AWS Identity Center (for users) and AWS Firewall Manager (for AWS Security Groups). Partners in the SOAR space can build further upon AWS's native capabilities.

1) AWS's CodePipeline suite integrates with IAM STS, for JIT access.

Hype Cycle



Hype Cycle for Cyber Risk Management, 2023



Source: Gartner, Varanium Research

Emerging Trends



Future Cybersecurity Trend	Description	Impact	Market Size by 2030
Autonomous Security Systems	Fully autonomous systems that leverage AI and ML to detect, respond, and neutralize threats with minimal human intervention.	Revolutionizes SOCs, reducing the need for large teams of analysts and enabling scalable security operations.	\$5 billion
Cybersecurity Mesh Architecture (CSMA)	A flexible, modular, and scalable architecture that defines the security perimeter around the identity of a person or thing, crucial for hybrid and multi-cloud environments.	Provides a more adaptable and resilient approach to securing complex IT ecosystems, particularly in cloud environments.	\$10 billion
Self-Healing Security Systems	Systems that automatically repair vulnerabilities, restore configurations, and recover from attacks without human intervention, integrating AI with DevSecOps.	Minimizes downtime and reduces the impact of cyberattacks, enhancing organizational resilience.	\$3.5 billion
Neurosymbolic AI for Cybersecurity	Combines neural networks with symbolic reasoning to enhance decision-making in cybersecurity, especially in complex scenarios requiring human-like understanding.	Offers advanced threat detection by interpreting subtle patterns and anomalies that current AI models might miss, providing deeper insights into potential threats.	\$2 billion
Human Augmentation and Cognitive Cybersecurity	Focuses on protecting augmented humans from cyber threats that target cognitive processes, as human augmentation technologies like brain-computer interfaces become more common.	Opens new areas for cybersecurity, requiring novel protection mechanisms for augmented human capabilities and cognitive functions.	\$2.5 billion
Cybersecurity in Quantum Communication Networks	Addresses the unique challenges and opportunities of quantum communication networks, including securing quantum key distribution (QKD) systems and data transmitted over quantum channels.	Quantum communication could offer unprecedented levels of security for data transmission, but also requires new cryptographic techniques and protocols to manage associated risks.	\$4 billion

Emerging Trends



Future Cybersecurity Trend	Description	Impact	Market Size by 2030
Decentralized Cybersecurity Protocols	Uses blockchain and distributed ledger technologies to enable peer-to-peer security mechanisms without a central authority, crucial for securing IoT and edge computing environments.	Decentralized security will be especially relevant for securing IoT devices and edge computing, where centralized models may be impractical.	\$7 billion
Cybersecurity for Synthetic Biology and Bioinformatics	Develops protections against bio-digital threats, including securing genetic data, protecting against biological system manipulation, and preventing attacks on bioinformatics platforms.	Leads to new sectors within cybersecurity, focusing on the intersection of digital and biological sciences.	\$1.5 billion
Adaptive Deception Technology	AI-driven technology that dynamically alters decoys and honeypots in response to attacker behavior, making it harder for attackers to distinguish between real and fake assets.	Enhances threat hunting and incident response, making it more difficult for attackers to gain a foothold in a network while revealing their tactics.	\$3 billion
Cybersecurity for Brain-Computer Interfaces (BCIs)	Secures BCIs by protecting neural data, securing interfaces, and preventing malicious manipulation of brain signals, essential as BCIs become more common in medical and consumer applications.	Cybersecurity for BCIs will be crucial in healthcare, defense, and consumer electronics, where brain-machine interactions could become a new frontier for cyber threats.	\$2 billion
Cyber Risk Quantification	Quantifying Cyber Risks to understand the cyber risk posture of the organisation so that top management can take informed decisions.	Streamlines different business functions in their understanding of the cyber risks and can take actions properly.	\$100 billion
AI Based Pentesting	automates and enhances traditional testing methodologies using artificial intelligence and machine learning.	AI-based penetration testing improves the overall security posture by enabling faster and more accurate vulnerability detection	\$8 billion

ZERON

A cyber risk posture management platform that offers a comprehensive solution to empower organizations to proactively manage and mitigate their cybersecurity risks.

Challenge

Bridging the Gap Between Cyber Risks and Business Impact

Problem Statement

Fragmented Risk Understanding:

- The organization struggled to map cybersecurity incidents to their potential financial and business impact
- Security teams lacked the tools to convert technical risk data into business language that executives and board members could understand.

Inconsistent Risk Reporting:

- Various business functions, from IT to finance, had inconsistent risk metrics and lacked a unified view of how cyber risks affected them.
- This resulted in siloed decision-making and an inability to prioritize investments.

Inefficient Communication with the Board:

- Security leaders faced challenges in communicating the severity and financial implications of cyber risks to the board and C-level executives, leading to delays in approving necessary security investments.

Solution

Automated Risk Quantification:

- Zeron provided automated quantification of cybersecurity risks, translating technical threats into financial metrics.
- This enabled business leaders to see real-time financial exposure from potential breaches and other security incidents.

Unified Risk Metrics Across Business Functions:

- By integrating with various existing security tools and systems, Zeron offered a consolidated view of risk across the entire organization.
- Each business unit could see how cyber risks impacted their specific functions, enabling more coordinated responses.

Tailored Communication for Stakeholders:

- Zeron generated dynamic, visually rich reports that translated technical security metrics into understandable financial terms.
- This simplified communication with the board, ensuring a better understanding of cyber risks at the executive level.

Key Achievements through Zeron CRQ

Financial Impact Visibility Across Business Functions

- Zeron enabled the organization to assess the financial impact of cyber risks across multiple business units.
- This provided a clear view of how security threats could affect operations, revenue, and customer trust, helping the organization make better investment decisions and prioritize risk mitigation strategies.

Improved Decision-Making at the Executive Level

- With access to quantified risk data, executives could make more informed decisions regarding cybersecurity investments.
- The CRQ reports demonstrated the cost-benefit of security initiatives, leading to faster budget approvals for essential security measures.

Real-Time Risk Monitoring and Response

- The integration of Zeron CRQ provided continuous risk monitoring, offering real-time updates on evolving threats and their financial implications.
- The organization could now respond more effectively to emerging risks, reducing the time to mitigate potential financial damage.

Alignment Between Security and Business Objectives

- Zeron facilitated a stronger alignment between the security team and business objectives.
- The risk quantification approach ensured that security efforts were focused on areas that posed the highest financial risk, leading to more strategic and cost-effective security implementations.

Impact on Organisations

60% Improvement in Risk Understanding

- Zeron's CRQ platform led to a 60% increase in the executive team's understanding of financial exposure due to cybersecurity threats. This significantly reduced the communication gap between the technical and business sides of the organization

Reduction in Time to Approve Security Investments

- With clear financial metrics demonstrating the potential costs of inaction, the time to approve critical security investments was reduced by 40%. This enabled the organization to implement security measures faster, reducing potential vulnerabilities.

Case Study

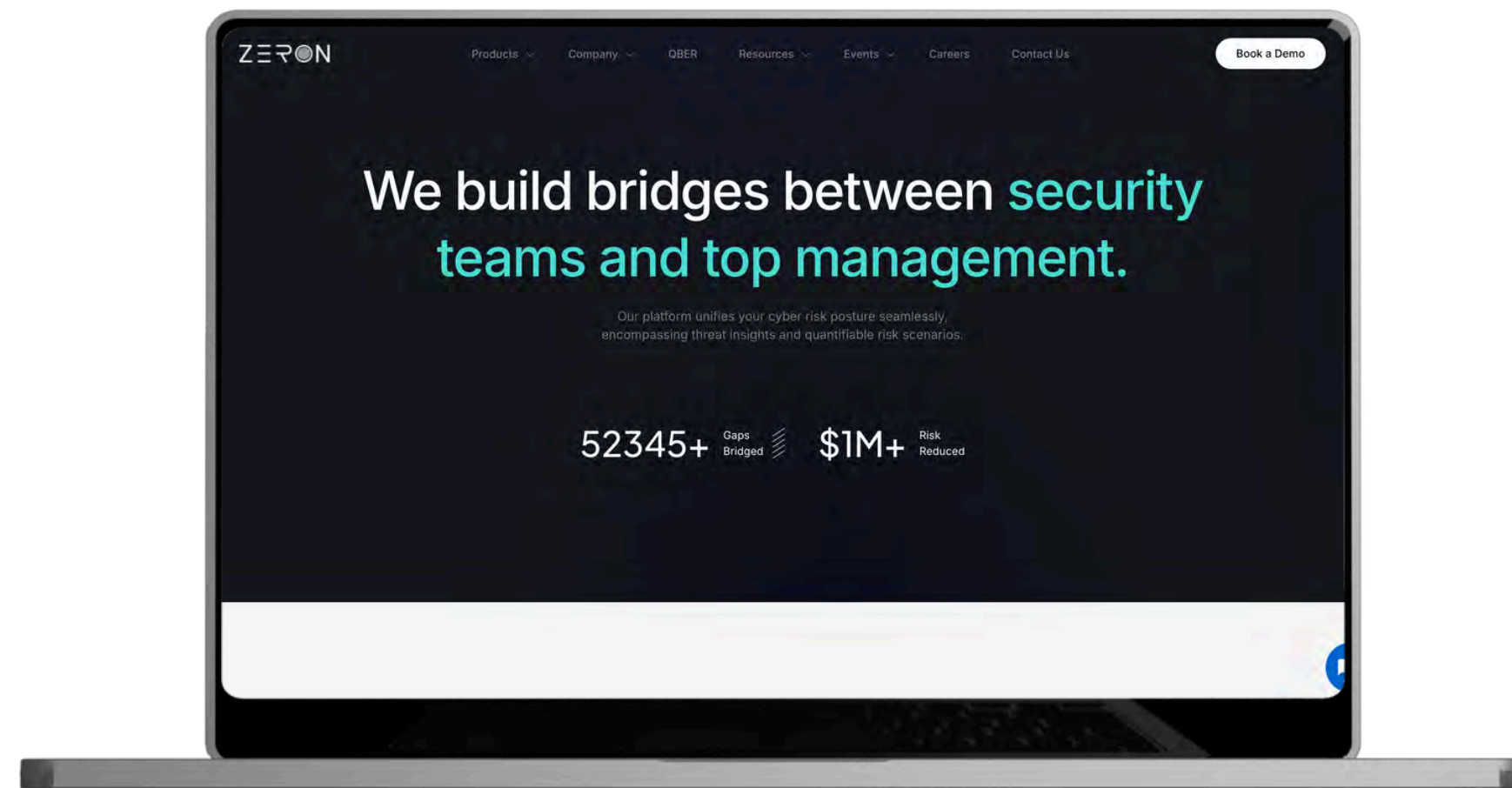


Enhanced Board-Level Reporting and Communication

- Zeron provided the security team with visually intuitive reports that clearly highlighted the financial implications of cyber risks. As a result, board members were more engaged in cybersecurity discussions, leading to faster, more informed decision-making.

Holistic Risk View Across 10+ Business Units

- Zeron's solution integrated risk data from over 10 business units, creating a unified view of cyber risk exposure across the entire organization. This helped in prioritizing investments in areas with the highest financial risk.



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Founder & CEO

Ex - GSAM, Shumway, Prime, Religare
MBA - NYU Stern, BE - IITR, CFA & FRM

Global Multi-Asset Management Firm, focused on
Emerging Market Strategies, India in particular

**Managing ~\$1.3 billion in Assets Under Management (AUM)
with offices in Mumbai, NCR, Singapore and Dubai**

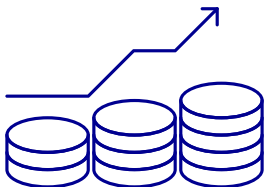


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Mr. Nitin Agarwal



Mr. Suvendu Prusty

