Artificial Intelligence Powered Financial Inclusion Strategies

Abstract

Over 1.3 billion people remain unbanked across the world, with a majority belonging to low-income and marginalized groups that are infeasible to service for traditional institutions. Financial Technology (i.e. Fintech) firms are playing a pivotal role in driving financial inclusion. Artificial Intelligence (AI) applications in particular show promise for servicing low-income and marginalized groups in an affordable and sustainable fashion. Yet AI-powered strategies drive financial inclusion in different ways based on the allocation of investments for deeper AI-driven decision-making and data-sharing with ecosystem partners. We compare nine cases across Africa, Asia, and the Americas to develop a 2x2 matrix of AI-powered financial inclusion strategies. The matrix positions cases according to investments in AI utilization in decision-making (assisted to autonomous) and data-sharing ecosystem synergy (low to high). Data-sharing ecosystem synergy broadens inclusion by expanding the partners and services that can be accessed. Whereas AI utilization deepens inclusion by enabling personalization, replicability and access to financial solutions for borrowers using alternative records. Strategies that combine both, such as that of M-PESA, deliver the broadest and most durable financial inclusion. The matrix provides a tool for managers to situate their offerings, sequence investments, and assess potential risks in optimizing financial inclusion offerings.

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Introduction

Digital innovations are expanding the role organizations can play in solving complex societal challenges that impact populations globally (Bohnsack et al., 2022). One such challenge is sustainable delivery of affordable and valuable financial services to all groups in a society, particularly low-income individuals. The World Bank treats financial inclusion as an enabler of a broad set of Sustainable Development Goals (SDGs), since access to savings and credit are necessary for households to spend on health, education, and other necessities. The gap persists because low-income customers are structurally unprofitable or risky to serve for traditional financial institutions due to limited credit histories, small balances, and irregular incomes. State-led responses have shown limits in driving inclusion, with substantial shares of newly opened accounts staying dormant (Demirgüç-Kunt et al., 2022).

Digital innovations have helped overcome these barriers with the rise of the Financial Technology (i.e. Fintech) market, which refers to financial services integrated with digital technologies (Alt et al., 2018). Innovative Fintech solutions such as mobile payments, super apps, digital wallets, and digital-only banks reduce the costs of transactions for customers and expand access to affordable digital financial services (Lashitew et al., 2022). Easy access to these services has made a sizable impact on the financial inclusion of low-income people and contributed to poverty reduction. In fact, the World Bank estimates that the expansion of digital financial services has helped decrease the number of adults without a bank account worldwide from 2.5 billion in 2011 to 1.4 billion in 2021 (World Bank, 2025).

Fintech firms have embraced Artificial Intelligence (AI) to reach financially excluded people in both developing and developed countries while also creating new revenue streams through data-driven cross-selling and low-cost solutions (Palmié et al., 2022). AI refers to the use

of algorithms, machine learning and other computational techniques to automate or augment decision-making processes (Brynjolfsson & Mitchell, 2017). AI-driven data analysis capabilities allow Fintech firms to achieve cost effectiveness, customization and speed (Jagtiani & John, 2018). Fintech firms are employing AI in credit analysis, customer support, cybersecurity, fraud detection and risk assessment, among others, to enable financial inclusion (Mhlanga, 2020).

Different AI-powered strategies, however, differently drive financial inclusion. These strategies depend upon the firm's investments in AI utilization in decision-making and data-sharing ecosystem synergy. Greater synergy or openness in data-sharing between ecosystem partners increases the breadth of inclusion by expanding the range of services offered. Whereas greater AI utilization in decision-making, from *Assisted* toward *Autonomous Intelligence*, moves decision rights from humans toward machines, and deepens inclusion by improving access to financial services and making them more personalized and replicable. Therefore, driving AI-powered inclusion requires Fintech firms to tackle the allocation problem of investing in the two distinct areas to increase the breadth or depth of financial inclusion.

This article explores how Fintech firms use AI to boost financial inclusion by examining nine cases across Africa, Asia, and Americas. We develop a matrix of strategies based on the investment in AI utilization in decision-making and data-sharing ecosystem synergy to show how firms can distinctly drive financial inclusion based on their digital investments. The matrix can be used by businesses to assess their AI capabilities and digital investments and identify the relevant inclusion strategy.

Overview of Literature on AI-Powered Strategies for Social Impact

Rising digitization and growing managerial demand for accelerated data processing are leading many Fintech firms to pursue AI-powered strategies to meet the dual objectives of business

profitability and financial inclusion. Based on a review of the literature on the stages in becoming an AI-powered organization and addressing financial inclusion, we identified two dimensions that are crucial for creating social impact. These are AI utilization in decision-making and data-sharing ecosystem synergy (Choudhary & Thenmozhi, 2024; Nguyen et al., 2023; Tantri, 2021). AI utilization, or the extent to which AI is embedded in organizational decision-making, determines information processing power, maturity of data-driven decision-making, risk management approaches, customer experience, and the depth of services. Data-sharing synergy determines the extent to which the firm is technically and relationally embedded in a data-sharing ecosystem. It determines information supply, data availability, complementor dynamics and breadth of services.

Examined largely in isolation, the two dimensions distinctly influence inclusion by driving breadth and depth of impact. Extant literature rarely separates the breadth and depth of inclusion, which are distinct outcomes that require firms to make strategic trade-offs. We address this gap by developing a framework integrating the two dimensions and their distinctive outcomes. We further expand upon how these two dimensions have been defined in literature and what they entail for financial inclusion.

AI Utilization in Decision-Making Dimension for Financial Inclusion

Transformation into AI-powered organizations is envisioned as a three-stage journey (Mittal et al., 2019; Vagia et al., 2016). *Assisted Intelligence* is the first stage in this journey towards achieving optimum AI utilization. Here, AI systems utilize cloud computing and large-scale data analytics to identify risks. These are, then, used by managers to make data-driven decisions. In the financial services industry, Fintechs utilize *Assisted Intelligence* through rule-based algorithms to build risk profiles for customers who lack a formal financial identity, collateral or credit record. *Assisted Intelligence* can also automate a subset of loans based on creditworthiness.

Organizations progress to the next stage in the AI transformation journey, called *Augmented Intelligence,* where machine learning (ML) capabilities are layered on top of existing information management systems to enhance human decision-making. Here, AI enhances managerial decision-making by providing predictive and real-time insights. In financial services, *Augmented Intelligence* can help Fintech firms forecast loan repayment and provide lending organizations with signals on borrower repayment patterns.

The third stage AI utilization stage is called *Autonomous Intelligence* wherein processes are digitized and automated so that machines, bots and systems can directly act upon intelligence derived from the processes. In the financial services industry, Fintech firms with loan granting systems that pay or deny loans in real time based on data patterns utilize *Autonomous Intelligence*.

Data-Sharing Ecosystem Synergy Dimension for Financial Inclusion

Research has shown that successful AI deployment requires synergies between a variety of players to address multiple priorities for developing competitive interoperable data-sharing ecosystems (Mandl et al., 2024). Higher data-sharing ecosystem synergy makes AI systems more efficient while also improving the overall customer experience. The Fintech ecosystem consists of Fintech firms, financial customers, traditional financial institutions, technology developers and the government (Lee & Shin, 2018). Data-sharing synergies between central banks, financial regulators, financial service providers and competition authorities improve risk management and enhance operational efficiency within the ecosystem. By enabling greater visibility into trends, creating digital identities and identifying patterns of vulnerability, interoperable data-sharing ecosystems result in lower costs and financial products that promote financial inclusion (i.e. access to financial services and products) of marginalized customers, especially in developing and emerging economies in Asia and Africa (Bedarkar & Conway, 2022; Ha et al., 2025).

Data-sharing refers to *infrastructure-level* sharing of data among different actors—both upstream and downstream—in the value chain to develop integrated product-service offerings. Take the case of Kaleidofin, which provides tailored financial solutions to underbanked women in India. Founded in 2017, Kaleidofin started out by helping customers reach their financial goals with savings, loans and insurance products. Kaleidofin's digital platform was developed in collaboration with an external vendor and was integrated with partner, bank and provider technical systems. This included backend integrations for data-sharing with a mutual fund transfer agency, asset management company, life insurance company and e-NACH (electronic National Clearing House, which is a financial system to automate payment processes for recurring bank transactions).

Data-sharing also occurs between *network-level strategic partners*. For instance, Safaricom (Vodafone's Kenyan company) has developed partnerships with businesses (e.g. e-commerce ride hailing services, healthcare systems) and banks (e.g. Central Bank of Africa). Network-level strategic partners enhance customer experience by providing multiple offerings on one platform. We discuss interoperable data-sharing synergy in terms of both *infrastructure-level* sharing and *network-level strategic partners*.

High data-sharing ecosystem synergy corresponds to system-level integration, modular interfaces and high interoperability of digital infrastructures, which enable seamless cross-institutional information exchange through standardized protocols, Application Programming Interface (API) driven architectures and secure data-sharing frameworks. For instance, the United Payments Interface (UPI) is a real-time payment system developed by the National Payments Corporation of India (NPCI) that enables instant money transfer between different bank accounts. This highly standardized digital infrastructure enables interoperability between banks, payment service providers and merchants. Medium data-sharing ecosystem synergy corresponds to partial

digital infrastructure integration and moderate interoperability, with data-sharing agreements restricted to some partners for select data. For instance, Uber has infrastructure integration with Google Maps and multiple payment service providers for ridesharing offerings. However, rider data is not shared with partners. Low data-sharing ecosystem synergy corresponds to low interoperability and ad-hoc infrastructure integration, where data exchange is restricted to specific tasks. For example, Starbucks uses its proprietary app to provide a closed-loop payment system through a digital wallet for in-store/online purchases and earn rewards redeemed at Starbucks locations. Digital funds cannot be transferred to other payment systems and lack interoperability with merchants, banks and third-party payment processors, exhibiting low data-sharing synergy.

Research Approach for Cross-Case Analysis

We employed qualitative comparative case analysis (Eisenhardt, 2021) to develop a typology of AI-powered strategies. It is designed as a conceptual framework, where the nine Fintech cases illustrate ideal configurations organized according to the two dimensions of AI Utilization in Decision-Making and Data-Sharing Ecosystem Synergy. We sampled purposively for variation across both dimensions and across geographies, including Sub-Saharan Africa, South and Southeast Asia, Latin America, and North America. Eligibility required documented deployment of AI or machine learning in a core financial decision process; a publicly documented data-sharing architecture; engagement with unbanked or underserved users; and sufficient public documentation to permit triangulation across independent sources. Organizational forms vary across the final set, including venture-backed lenders, a licensed payments bank, a business-to-business infrastructure provider (Lucinity), and a nonprofit–private coalition (Shikilia). Cross-contextual analysis allowed us to examine variation in Fintech firm strategies while maintaining coherence of the dimensions across different settings.

Data was collected using archival sources, namely, peer-reviewed articles, company whitepapers, press releases, and technical documentation (Das et al., 2018). Tables 1 and 2 define the two dimensions. To make classification auditable, we operationalized each level as a decision rule and classified each outcome at the highest level for which the rule was met on a core financial decision (e.g. origination, pricing, disbursement, recovery, or fraud control).

Table 1: Construct Definition for AI Utilization in Decision-Making

AI Maturity Stage	Explanation	Key Features/Indicators
Assisted Intelligence	Large-scale data analytics, cloud computing and data science are used to identify risks and support decision-making.	▪ Human-led decisions ▪ Rule-based algorithms ▪ Limited automation of repetitive routine tasks
Augmented Intelligence	Machine learning capabilities are layered over existing systems to enhance decision-making by providing predictive and real-time insights.	▪ Human-AI collaboration for decision-making ▪ Machine learning-based forecasts ▪ Reduced human intervention in complex processes
Autonomous Intelligence	Processes are digitized and automated so that AI systems make and execute decisions without human intervention.	▪ Real-time automated decision-making ▪ Self-updating models ▪ Increased personalization and targeting

Table 2: Construct Definition for Data-Sharing Ecosystem Synergy

Synergy Level	Explanation	Key Features/Indicators

Low	Ad-hoc and siloed data-sharing, limited to specific tasks or projects, through proprietary systems.	▪ Minimal interoperability and standardization ▪ Point-to-point data infrastructure integration ▪ Data-sharing limited to specific tasks/functions
Medium	Selective data-sharing, controlled information exchange with a closed network of partners.	▪ Moderate interoperability and standardization ▪ Partial infrastructure integration ▪ Consistent data formats and structures across partners ▪ Controlled use of APIs
High	Fully interoperable, open data-sharing platforms.	▪ High interoperability ▪ System-level integration ▪ Partnerships with diverse actors ▪ Modular interfaces and fully standardized protocols

Each author independently classified all nine offerings on both dimensions using the rules above. Disagreements in 6 of 27 classification decisions were logged and resolved by returning to the source documents and discussing to consensus. In line with consensus coding practices, we have not reported a chance-corrected agreement coefficient. With nine cases, such coefficients carry confidence intervals too wide to be informative, and because the coders are also the authors, a high coefficient would demonstrate shared interpretation rather than independent validation (Campbell et al., 2013). Based on the classification, we characterize the indicated financial inclusion outcome and corresponding with summary labels for each cell. These are discussed in detail in the next section.

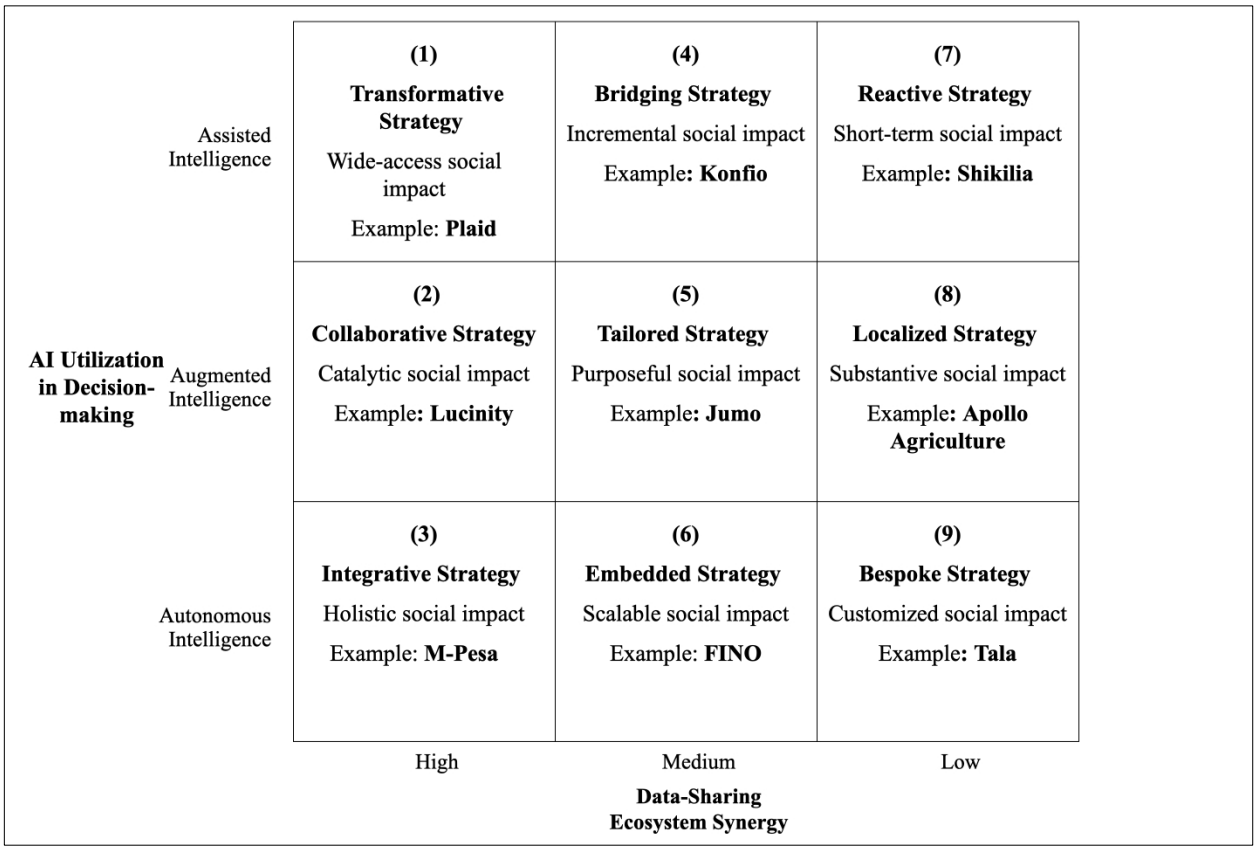
Matrix of AI-Powered Financial Inclusion Strategies

We envision financial inclusion as a data and decisioning problem, since these two dimensions can help financial institutions manage the overhead associated with non-traditional data collection and

swift processing to serve unbanked low-income individuals. Data-sharing synergy unlocks diversity and legitimacy of accessible data sources, while AI utilization provides speed and scalability to leverage alternative data sources for service provision. The two dimensions represent complementary capabilities of external data access and internal integration for decision-making respectively.

Taken together, the two dimensions can outline Fintech firms' strategic choices and trade-offs for financial inclusion and are better suited to provide actionable insights into Fintech strategies compared to other dimensions (e.g. business models, operating geographies, AI model infrastructure). The matrix is presented in Figure 1.

Figure 1: AI Powered Financial Inclusion Strategies Matrix



Transformative Financial Inclusion Strategy: High Synergy and Assisted Intelligence

Quadrant One, categorized as the "Transformative Financial Inclusion" strategy represents Fintech firms that are at early stages in their AI transformation journey and have developed *Assisted Intelligence* technologies which speed up the process of analyzing massive amounts of data to answer time-consuming managerial queries. They are deeply integrated into the interoperable data-sharing infrastructure, which allows them to utilize capabilities of other firms in the ecosystem. High data-sharing ecosystem synergies and early-stage AI capabilities create *wide-access social impact*.

For a Transformative Financial Inclusion Strategy, we cite Plaid, a key infrastructure player. Plaid, a data aggregator, built a data transfer network that enables both Fintech firms and traditional institutions to offer and connect digital finance products. It uses APIs to integrate over 11,000 financial institutions globally and 6000 Fintech applications (Búadóttir et al., 2023). Plaid acts as a digital platform intermediary i.e. a bridge between banks and Fintech applications (e.g. Venmo and Chime) such that users can connect their bank accounts to various Fintech services. Plaid's APIs enable secure and seamless data connectivity between users, financial institutions and third-party applications to create high data-sharing ecosystem synergy. Access to secure and consolidated data from various institutions enables services such as peer-to-peer payments, budgeting, investing, lending, and online banking (Awrey & Macey, 2023).

Plaid creates *wide-access social impact* by improving the lives of low-income, marginalized customers in two ways. First, it utilizes *Assisted Intelligence* to improve the ability of lenders to serve borrowers with limited or incomplete credit history by analyzing user documents to provide a creditworthiness score (Yao et al., 2023). Machine learning is used to identify borrower income verification, transaction data enrichment and fraud detection. Yet human

oversight is a key part of its operations. Second, it provides unbanked customers with convenient access to a wide variety of financial services (i.e. credit, savings and payment). High data-sharing ecosystem synergy enables Plaid to act as an infrastructure player, driving high integration and interoperability with service providers for expanded financial access.

Collaborative Financial Inclusion Strategy: High Synergy and Augmented Intelligence

Quadrant Two, categorized as the "Collaborative Financial Inclusion" strategy represents firms that have advanced in their implementation of AI and use both *Assisted* and *Augmented Intelligence*, while leveraging high data-sharing ecosystem synergies through cross-system integration and interoperability to create *catalytic social impact*.

As an example, we cite Lucinity, a leading provider of AI-driven financial crime prevention operating systems. Founded in 2018, Lucinity uses AI technology to spot suspicious activity. Its platform features Luci, an AI copilot, which leverages Microsoft's Azure advanced Large Language Models (LLMs) to transform complex investigations into concise, actionable insights and leverages partnerships to deliver financial crime prevention solutions (Stefánsson et al., 2021). Its federated learning framework promotes cross-institutional intelligence sharing.(Lucinity, 2024b) Further, its interoperable tools (e.g. Luci Plugin) integrate seamlessly into enterprise systems (e.g. CRMs, Excel) without major infrastructure changes, driving high data-sharing ecosystem synergy.

Lucinity relies on *Assisted and Augmented Intelligence* since its platform combines AI recommendations with human decision-making. It utilizes *Assisted Intelligence* for real-time data monitoring for suspicious patterns and *Augmented Intelligence* to uncover hidden threats like synthetic identities and generate predictive insights through the Luci Copilot. These capabilities are enhanced by federated learning. Lucinity's platform uses Generative Intelligence Platform

Automation (GIPA), which reduces manual intervention in complex processes while automating some tasks. Lucinity's Collaborative Financial Inclusion Strategy creates *catalytic social impact* by helping partners (i.e. institutions with different technical expertise) investigate and prevent financial crime. The human-AI collaborative model significantly reduces investigation time. Since Lucinity's platform seamlessly integrates with legacy systems, it reduces the costs for financial institutions and streamlines compliance (Lucinity, 2024a).

Integrative Financial Inclusion Strategy: High Synergy and Autonomous Intelligence

Quadrant Three, categorized as the "Integrative Financial Inclusion" strategy represents Fintech firms that have high data-sharing synergy and are at the advanced stage of AI-transformation, employing a combination of *Assisted*, *Augmented* and *Autonomous Intelligence* technologies to create *holistic social impact*. *Autonomous Intelligence* allows for automation of decision-making in real time, significantly enhancing the speed of data analysis while increasing accessibility, affordability and efficiency of offerings. Being embedded in deeply integrated systems with high data-sharing interoperability allows them to leverage their AI capabilities to address financial inclusion.

As an example, we cite Kenya's mobile payment platform: M-PESA, one of Africa's largest Fintech providers which connects over 50 million customers and 500,000 businesses. Started in 2007 by Safaricom, M-PESA made it possible for Kenyans without a bank account to conduct secure peer-to-peer money transfers. M-PESA facilitated creation and expansion in the mobile money agent network (Lashitew et al., 2022) with 110,000 M-PESA agents functioning as automated teller machines (ATMs). Cash deposited with agents is converted into "e-money" which is credited to the customer's mobile money account and transferred to recipients via text message.

Kenyan businesses deposit cash in M-PESA mobile wallets that larger companies accept. Safaricom offers micro-lending services (e.g. M-KOPA, M-SHWARI) for registered M-PESA borrowers with no credit history. Instead of loans being based on traditional factors (e.g. collateral), *Assisted Intelligence* assesses customer creditworthiness using telecommunication-based credit-scoring algorithms which evaluate mobile network data (i.e. customer airtime usage, airtime credit) to create credit scores (Qureshi et al., 2021). *Augmented Intelligence* drives predictive data on repayment patterns to aid decisions on pricing and customer protection.

Autonomous Intelligence is exhibited through diverse services, real-time decision-making and self-operating systems. M-PESA provides an overdraft service, Fuliza that disburses a short-term loan for users with insufficient funds to complete transactions and automatically recovers repayments from incoming M-PESA funds. Its chatbot, Zuri, provides instant support and guidance to address customer queries and execute tasks like reversing payments, managing subscriptions, and checking balances without involving a human agent (Safaricom, 2021, 2025). Notably, chatbots may be considered as assisted, augmented or autonomous intelligence, depending upon the decision-making capabilities, reliance on human input and ability to learn or adapt without human intervention (Mittal et al., 2019). M-PESA has built fraud detection models to proactively identify fraud scenarios like SIM swaps and provide real-time user alerts in high-risk localities (Kipkemoi, 2025).

To expand its operations and process high volume payments at scale Safaricom broadened its data-sharing synergy by anchoring all its financial products in the Microsoft ecosystem (Azure cloud). M-PESA has established itself as an infrastructure player by leveraging strong customer relationships, agent networks, partnerships with banks and highly standardized protocols to deliver

a wide variety of financial and non-financial services. Its Integrative Financial Inclusion Strategy has lifted millions of unbanked Kenyan households out of poverty to create *holistic social impact*.

Bridging Financial Inclusion Strategy: Medium Synergy and Assisted Intelligence

Quadrant Four, categorized as the "Bridging Financial Inclusion" strategy, represents AI-powered Fintech firms at early AI transformation. These Fintech firms leverage *Assisted Intelligence* and medium levels of interoperable data-sharing ecosystem synergy.

As an example, we cite Mexico's Konfio, a Fintech firm that offers financial services (i.e. digital payments and lending) for Micro, Small, and Medium Enterprises (MSMEs) through its AI-based credit risk assessment methodology (Accion Venture Lab, 2018; Kshetri, 2021). Women-owned enterprises make up over a third of MSMEs but encounter significant barriers to credit access due to gender bias in lending and high-risk perception. Since its inception in 2013, Konfio has become the largest online lending platform for MSMEs such that by 2022 it had 45,953 MSME customers and issued over 1480 loans per month. Its platform eliminates gender bias by using algorithms to make lending decisions based on applicants' credit risk by scanning traditional data sources along with alternative data sources such as transactional and behavioral patterns on e-commerce websites (DFC, 2024). While getting a loan in Mexico is time consuming, Konfio's platform completes the loan process within 7 minutes. It also offers multi-million-dollar credit and credit cards for businesses (Khoso, 2023).

Konfio exhibits medium data-sharing synergy because it retains tight control over client information rather than employing standardized protocols. Also, data-sharing is not fully integrated and interoperable across financial institutions. It leverages digital sales and transactional data from Mercado Libre, an e-commerce website to assess creditworthiness and provide loans. Konfio also does not have seamless access to national credit records, limiting its interoperability

that is restricted further due to the application of proprietary algorithms. Konfio facilitates MSME payments and credit from financial institutions (e.g. Goldman Sachs, Gramercy) and partners with Visa to offer credit cards tailored for MSMEs and with PayPal to allow MSMEs to use their PayPal accounts for credit access. This suggests some data-sharing infrastructure integration, but it does not function like a systemic Fintech infrastructure player.

By offering low-touch digital financial services, Konfio's Bridging Financial Inclusion Strategy creates *incremental social impact* for underserved MSMEs. Medium levels of data-sharing ecosystem synergy allow leveraging partners to increase the number of unsecured loans offered. Yet, primary reliance on *Assisted Intelligence* retains focus on risk assessment and limits product customization, predictive abilities and automation to drive independent decision-making.

Tailored Financial Inclusion Strategy: Medium Synergy and Augmented Intelligence

Quadrant Five, categorized as the "Tailored Financial Inclusion" strategy represents Fintech firms advancing in AI implementation through a combination of *Assisted* and *Augmented Intelligence* technologies but are still working on data-sharing synergy development.

As an example, we cite Jumo. Founded in 2015, Jumo is a Fintech firm with headquarters in South Africa and a growing presence in Africa and Asia. It offers financial products to financially excluded consumers in emerging markets. Jumo uses AI and machine learning to build accurate credit scores and tailored financial products for people without a formal financial identity, collateral, or credit records (Pollio & Cirolia, 2022). *Assisted Intelligence* speeds up the process of loan approvals and improves risk assessment processes. Jumo also uses *Augmented Intelligence* to make accurate predictions about customer loan repayments behavior. Its AI system has three main components: the Advanced Data Engine, End-to-end banking technology and an operating platform housing them. The Advanced Data Engine utilizes user mobile phone data to develop

insights while the End-to-end banking technology analyzes user behaviors to assess their creditworthiness (Timm, 2019).

Jumo's Tailored Financial Inclusion Strategy creates *purposeful social impact* by leveraging its AI capabilities of credit scoring, targeted financial services and loan repayment prediction. While Jumo interfaces with mobile operators and payment providers in the African market for disbursing loans and other financial services, it has limited data exchange with partners. Jumo displays medium data-sharing ecosystem synergy due to its reliance on user-permissioned data from mobile operators to assess creditworthiness and proprietary algorithms to retain data control as a processor, rather than as an owner (Barten, 2024; Mouton, 2025).

Embedded Financial Inclusion Strategy: Medium Synergy and Autonomous Intelligence

Quadrant Six, categorized as the "Embedded Financial Inclusion" strategy represents Fintech firms at the advanced stage of AI-transformation that utilize a combination of *Assisted*, *Augmented* and *Autonomous Intelligence* technologies while still working on interoperable data-sharing ecosystem synergy to create *scalable social impact*.

As an example, we cite India's Financial Inclusion Network and Operations (FINO) Bank. FINO PayTech was founded in 2006 to help banks provide doorstep banking to low-income groups in remote rural areas by employing handheld biometric devices (Gupta & Kanungo, 2022). Customers received a FINO smart card to perform transactions without visiting a bank branch. With a diversified product portfolio (e.g. savings, payment service, remittances, etc.) and dedicated FINO agents, it provided end-to-end identification, acquisition and service of customers. It opened over 50 million bank accounts for other banks (Maitra & Upadhyay, 2017).

In 2017, it received a payments bank license to open bank accounts under its own brand. FINO Payments Bank has collaborated with partners for financial products and digital

infrastructure development. These include partnerships with multiple banks (private and public) for loans, Fintech firms like Go Digit for insurance, and Clari5 for AI-based fraud detection system development. FINO developed an API banking platform and ready-to-integrate tools.(Fino Payments Bank, 2023) FINO Payments Bank utilizes AI Intelligence in the areas of fraud analytics and cybersecurity for improving customer experience and operational efficiency. AI checks data from several sources, provides answers in real time, and sends fraud alerts. Text analytics allow FINO to tap and convert most potential leads into business opportunities. FINO replaced legacy systems by automating back-office processes through digital payment modes, agent onboarding, chargeback processing and opening customer accounts (Smriti, 2024).

FINO's Embedded Financial Inclusion Strategy creates *scalable social impact*. FINO began its journey as a service provider for different financial institutions. Through partnerships with various banks and Fintech firms, it increased the range of financial services offered. In 2017, FINO received the license to become a digital bank and launched a standardized API banking platform. Concurrently, FINO enhanced its AI capabilities by automating back-office processes and adding fraud detection functionalities (Fino Payments Bank, 2023). While FINO does not have extensive partnerships at present, its growing ecosystem synergy and *Autonomous Intelligence* have helped it to expand the breadth and depth of financial services reaching customers in remote regions across India. This creates *scalable social impact*, and with continued investments in the data-sharing ecosystem synergy it can potentially achieve *holistic impact*.

Reactive Financial Inclusion Strategy: Low Synergy and Assisted Intelligence

Quadrant Seven, categorized as the "Reactive Financial Inclusion" strategy represents Fintech firms that have low data-sharing synergies and are at early stages in their AI transformation journey which creates *short-term social impact*.

As an example, we cite Shikilia's emergency cash transfer in Kenya. Shikilia is a coalition of non-profit and private sector organizations providing emergency cash transfers to low-income Kenyan communities. Founded during the pandemic for Kenyan communities that had lost income and were especially hard hit, it now raises money and advocates for monthly cash transfers for low-income Kenyan households (Bedarkar & Conway, 2022). While it collaborates with GiveDirectly, a nonprofit that links donors online with people in need, it exhibits low data-sharing ecosystem synergy because of its reliance on user-permissioned data from mobile network operators, banks and the government for workflow automation.

Shikilia utilizes *Assisted Intelligence* to analyze geospatial, demographic and telecommunications data to identify communities at greatest risk and hardest to reach to provide monetary support using mobile money. The pandemic destroyed informal labor markets which trapped many low-income Kenyan communities into extreme poverty. In an environment where households suffered an attack on their health and well-being, these cash transfers were especially beneficial in replacing lost income for low-income Kenyans. Post-pandemic, Shikilia's emergency cash transfers have mitigated poverty and extreme hunger by helping the beneficiaries to pay for items such as food, shelter and cleaning products (Levine et al., 2023). Thereby, Shikilia's Reactive Strategy provides immediate and temporary financial inclusion to recipients, creating *short-term social impact*.

Localized Financial Inclusion Strategy: Low Synergy and Augmented Intelligence

Quadrant Eight, categorized as the "Localized Financial Inclusion" strategy is employed by Fintech firms with low data-sharing ecosystem synergies that utilize a combination of *Assisted* and *Augmented Intelligence* technologies.

As an example, we cite Apollo Agriculture. Apollo was founded in 2016 and received funding from British International Investment (BII) and the Dutch Development Bank to empower small-scale Kenyan and Zambian farmers to increase their profits while farming more sustainably. It utilizes *Assisted Intelligence* and *Augmented Intelligence* along with remote sensing technologies (to capture the GPS boundary of farms) for offering loans to farmers. Farmers are provided with a complete package to invest, scale and protect their businesses. This includes crops, farming inputs (e.g. pesticides), voice-based training on farming topics (e.g. sustainable farming practices, pest problems), and financial literacy, market access and climate insurance. The product package is delivered as a loan, which allows farmers to buy what they need at the start of the year and payments are not due until after the harvest (Kiaka, 2024).

By developing an in-depth understanding of farmers to create a bundled loan product customized to the farm size and approving loans for purchasing farm inputs locally, Apollo's Localized Strategy creates *substantive social impact*. *Augmented Intelligence* helps in enhancing and deepening farmer experience with Apollo's bundled financial product (Quenum, 2022). Apollo's strategy drives financial inclusion by fitting farmers' needs (e.g. climate insurance to protect their income against loss when a harvest fails) (Chan Zuckerberg Initiative, 2022). Notably, Apollo has limited partnerships due to its focus on deep consumer relationships through its proprietary bundled product.

Bespoke Financial Inclusion Strategy: Low Synergy and Autonomous Intelligence

Quadrant Nine, categorized as the "Bespoke Financial Inclusion" strategy is employed by Fintech firms that are at advanced stages in their AI transformation journey but have low data-sharing ecosystem synergy due to which they prioritize *customized social impact*. These organizations employ *Autonomous Intelligence* to target unbanked customers with a lack of financial records.

As an example, we cite Tala to demonstrate the Bespoke Strategy. Founded in 2011 in United States, Tala is a large digital credit company operating in several emerging markets including Kenya, India, Mexico and Philippines. It uses a smartphone application to evaluate the credit risk of people with limited credit history and create credit profiles by accessing their message and their phone call logs (e.g. number of people they communicate with every day, number of times they call their parents, on-time bill payments) (O'Connor, 2017). Tala then lends out unsecured loans to unbanked individuals to assess repayment patterns in experimental settings. It collates this data with their smartphone data profiles to conduct predictive assessment of their borrowing and repayment behavior using a proprietary machine learning model. Tala relies on alternate data, partly collected through M-PESA, and utilizes proprietary algorithms for credit assessment and loan disbursals (Onyango, 2018). Tala exhibits low data-sharing ecosystem synergy since it prioritizes ad-hoc partner integration (e.g. digital wallet with Union Digital Bank available within Tala's mobile app, loan channeling with Maya Bank in Philippines, and Visa card linked to Tala's digital wallet) (Behrens, 2021; P. R. Web, 2024). Tala has plans to increase partnerships after receiving its license for lending in Kenya (Namunwa, 2023). It may move from low to medium but not high data-sharing synergy, as it continues to regulate data access through its proprietary mobile app and maintain tight control over data sharing.

Tala's Bespoke Strategy relies on proxy indicators (i.e. phone scraping data) and *Autonomous Intelligence* to analyze data captured by other organizations to create credit profiles and predict repayment patterns for unbanked people autonomously (Tala, 2024). Unlike mature digital credit providers that provide generalized financial services, Tala's strategy and *Autonomous Intelligence* drive the creation of financial products that create *customized social impact*. *Autonomous Intelligence* allows Tala to replicate the unsecured credit access model across

different geographies in emerging markets. Yet, low data-sharing synergy lowers infrastructural support and leads to higher defaulting customers, unlike infrastructural players like M-PESA (Donovan & Park, 2022).

Actionable Recommendations for Fintech Businesses

The cases presented in our proposed matrix illustrate an assortment of AI-powered strategies for financial inclusion. As data-sharing ecosystem synergy increases, Fintech firms increase interoperability with partners to expand their financial products on the demand side or become a standard infrastructure provider on the supply side or both. Shikilia in Quadrant 7 offers limited services for short-term impact. But, as data-sharing ecosystem synergy increases from Shikilia to Konfio to Plaid, financial offerings expand considerably to create broader financial inclusion.

On the other hand, moving from the top to the bottom in the matrix, advancement in AI application enables personalization, replicability and financial inclusion. As Fintech firms progress in their AI transformation journey from *Assisted Intelligence* to *Augmented Intelligence* to *Autonomous Intelligence*, as seen in Shikilia, Apollo Agriculture and Tala, there is a growth in the depth of customer insights and replicability of solutions for unbanked consumers, creating *short-term, substantive and customized social impact*. M-PESA in Quadrant 3 is able to combine the benefits of high data-sharing ecosystem synergy and *Autonomous Intelligence* to develop a service ecosystem and thereby deliver comprehensive, long-term financial inclusion.

Evolving Financial Inclusion Strategies

It is important to underscore that strategic choices are dynamic and tend to evolve over time. Fintechs can utilize strategies in different Quadrants depending on their Artificial Intelligence transformation journey and extent of data-sharing ecosystem synergy. We use the example of FINO

Payments Bank to discuss the progression of strategies. During its first five years, FINO Payments Bank utilized what we refer to as FINO 1.0 strategies, where they established the digital infrastructure to integrate customer digital payments and physical banking outlets. During the second phase since 2022, FINO 2.0 strategies grew its AI technology. FINO employed *Assisted Intelligence* for fraud detection-related data analytics. Next, FINO developed predictive modelling to identify customers likely to renew subscriptions, purchase partner products (e.g. insurance), and project customer bank balance levels. FINO 3.0 strategies integrated *Autonomous Intelligence* by reducing human intervention in routine tasks and automating back-office processes. FINO continues to develop in-house digital transactions to increase *Autonomous Intelligence* related transaction processing.

FINO initiated operations with low data-sharing ecosystem synergy by focusing on building proprietary solutions, including its mobile point-of-sales device to provide door-to-door banking services. It developed few partnerships with banks for loan products and integrated an AI-based fraud detection solution from Clari5. Between 2019 and 2021, FINO expanded partnerships with other Fintech firms (e.g. Go Digit to offer insurance for MSMEs and City Cash for contactless public bus payment). In 2022, it launched API banking solutions and software development tools that easily integrated with partner digital infrastructure to improve data-sharing. FINO has made significant strides by transitioning from low to medium data-sharing synergy. Currently, it seeks to create high data-sharing ecosystem synergy by driving partner adoption through API banking solutions. FINO has made strides in its AI transformation journey while simultaneously increasing data-sharing ecosystem synergy and adopted strategies in Quadrants 7, 5, 8 and 6, and now seems poised to adopt the Quadrant 3 Integrative Strategy for creating holistic financial inclusion.

Investing to Advance AI Utilization

Most companies employing *Assisted Intelligence* seek to enhance their offerings by making investments to progress towards *Augmented Intelligence*. Choices in moving from *Assisted Intelligence* to *Augmented Intelligence* revolve around enhancing technological capabilities to improve customer experience and operational efficiency, while balancing integration costs and complexity. On the other hand, strategic choices related to transformation to *Autonomous Intelligence* revolve around balancing speed and operational cost-savings for high-volume operations with considerations regarding scale, capital costs, talent gaps and risks related to control, adaptability and transparency tied to the loss of human oversight.(Laine et al., 2024)

While we found evidence of firms transitioning from *Assisted Intelligence* or *Augmented Intelligence* to *Autonomous Intelligence*, the transition might not be linear. Firms driven by high-volume and time-sensitive operations are likely to make investments in *Autonomous Intelligence* capabilities for savings in operational costs and time. Conversely, for MSMEs, transitioning to *Autonomous Intelligence* may be cost-prohibitive due to infrastructure demands, talent gaps and data management costs. While AI tools can augment or automate routine decisions, managerial insight is usually needed to make complex decisions. In industries where human oversight is critical, such as healthcare, players might choose to adopt *Augmented Intelligence* diagnostics over *Autonomous Intelligence*. Additionally, in highly dynamic environments and for emergency responses, firms may rely on *Assisted Intelligence* or *Augmented Intelligence* for real-time or predictive insights while retaining human adaptability.(World Health Organization, 2021)

Transitioning to High Data-Sharing Ecosystem Synergy

High and low data-sharing ecosystem synergy represent distinct approaches of infrastructure standard creation versus proprietary play respectively. Fintech firms with medium synergy must decide whether to transition towards high or low synergy or maintain targeted partnerships in

medium synergy. Companies could seek to engage in partnerships in initial stages to offer products in collaboration but if they seek to prioritize proprietary play, it is beneficial to develop their own offerings to scale and opt for lower data-sharing ecosystem synergy. On the other hand, firms might choose to ramp up data-sharing ecosystem synergies for interoperability to progress towards becoming the dominant standard.

Straddling Strategies for Broader Financial Inclusion

Along with transitioning across Quadrants, diversified organizations may simultaneously adopt multiple strategies. For instance, M-PESA straddles strategies in multiple Quadrants through different portfolio businesses. M-PESA relies on high data-sharing synergy and *Autonomous Intelligence.* However, its affiliated offerings, M-SHWARI and M-KOPA, adopt Bespoke and Bridging strategies respectively.

Our matrix not only helps to determine the Quadrant in which a Fintech firm currently competes, but also how the firm might seek partnerships, alliances, and acquisitions to enhance its AI utilization or data-sharing synergy. For instance, firms in Quadrant 3 might adopt a winner-take-all model of platform play with an extensive portfolio of offerings and be attractive partners for banks seeking to offload risk. Whereas Fintech firms in Quadrant 9 might focus on niches, like customized credit solutions, and be ripe for acquisition by larger financial institutions with existing data infrastructure but lacking in-house AI expertise.

Moving Forward for Digitally Driven Financial Inclusion

The matrix outlines the strategic choices for practitioners seeking to drive financial inclusion by harnessing advanced technologies. Although we focus on Fintech firms, our matrix of strategies is generalizable to platform businesses in education, retail and travel, among others.

The matrix is also helpful for regulators and central banks considering sandbox regulations, open-banking mandates and explainable AI requirements to determine risk and potential for creating public goods. For instance, Fintech firms lack clarity about data that can be used for AI-based decision-making, regulatory approvals and liability management. Also, using alternate sources of information and unvetted data streams for credit assessment creates a significant governance challenge in monitoring inclusion for credit access and interest rates. This is particularly problematic because conventional banking rules may not apply to Fintech firms, enabling them to make arbitrary service decisions. Therefore, policy interventions such as minimum standards for data-sharing and AI governance protocols need to be established. These will have a differential impact depending on where a firm situates its strategy in the matrix.

Concluding Comments

The article provided a matrix of different Fintech AI-powered financial inclusion strategies. We examined business strategy for financial inclusion as a data and decisioning problem. We highlighted that the extent to which firms make investments to build their AI capabilities—allowing them to progressively advance from Assisted Intelligence to Augmented Intelligence to Autonomous Intelligence—and expand their interoperability and partnerships—to create well-functioning data-sharing ecosystem synergy—promotes their ability to expand the range of service offerings (financial and non-financial) and, thereby, create broader financial inclusion.

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