

DIGITAL PUBLIC INFRASTRUCTURE: ENCOURAGING INNOVATION

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PART 1

How the private sector has benefitted from DPI

1. **Innovation:** The development of new products and services that improves the quality and efficiency of public services. For example, Google Pay created a smart phone payments app, the the first of its products based on the Indian DPI, and the first ever product Google created specifically for India. Other such Google products will be created for and tested in India – for global use.
2. **Cost-Effective Solutions** in financing DPIs for service delivery. India has reduced a bank's cost for on boarding a customer from \$23 to \$0.1.
3. **Improved Citizen Engagement:** applications and services that make it easier for citizens to use DPIs. and build trust between citizens and the government. The DigiLocker is where all documents from school certificates to health reports can be stored for use whenever needed and, in any geography, saving the citizen time, money and logistical difficulty.
4. **Access to Talent:** Governments can access the private sector's top talent pool and leverage their expertise to improve the design and implementation of DPIs. A good example is the BNPL exercise – Buy Now, Pay Later. Private sector fintech and e-commerce players have found a way to use multiple consumer data inputs to determine the credit risk of an individual and accordingly provide a short-term small loan to the individual to be able to buy a product online and on credit, for the first time. A second example is the recently launched Open Network for Digital Commerce (ONDC) that operates on an open protocol and has the potential to assist the government in discovering new talent. The network can facilitate local commerce across a variety of segments, including mobility, grocery, food order and delivery, hotel booking, and travel, among others. By enabling any network-enabled application to discover and engage with these segments, the ONDC can provide a platform for the government to identify and connect with talented businesses and help MSMEs flourish.
5. **Economic Growth:** The domino effect of DPIs on business and citizens is evident. A cash-based economy has been digitised, thereby formalised. Over the past three years, adaptation of DPI by Indian ministries for subsidies, has saved up to 1.14% of GDP¹ or Rs. 2,230 billion – monies used instead to expand and better use government schemes for poverty alleviation. In the summer of 2021, India saw a blossoming of e-commerce start-ups, all of which have used DPI for benefit. That year, India had 37 unicorns, which have grown to 107 in 2023, and attracted XYZ global investment.

¹ "Direct Benefits Transfer", DBT Bharat, As accessed on 27th July 2023, <https://dbtbharat.gov.in/estimatedgain>.

The private sector can do this because the DPI provided by India Stack has reduced the cost of doing business, speeded up the process, increased market reach and enhanced trust and security.

PART 2.

Digital Public Infrastructure vs. Digital Private Products

PRIVATE / COMMERCIAL PLATFORMS

1. Lock-in the value created
2. Align stakeholders to valuation
3. Act to increase platform dependence
4. Are governed by “return” goals
5. Focus on “consumption” experience
6. Focus on competitive metrics
7. Anxious about disruption as it can impact their business

Examples:

- Credit cards
- Smartphone messaging apps (Whatsapp, WeChat)
- Email (Gmail)
- Private e-commerce marketplaces
- Commercial entities

PUBLIC / SOCIETAL PLATFORMS

1. Distribute the value created
2. Align stakeholders to inclusive impact
3. Act to increase platform openness
4. Are governed by “impact” goals
5. Focus on citizen choice
6. Focus on transparency metrics for governance accountability
7. Embrace disruption to find new ways to deliver societal impact

Examples:

- UPI
- Account Aggregators
- ONDC
- Not-for-profit

PART 3

Private and public sector collaboration on DPI

The success of digital public infrastructure in countries such as India, Estonia, Ukraine are due to a variety of models of collaboration between the public and private sectors.

The experience of India Stack, over the past decade, has examples of these collaborations and how they enhance innovation, cost-efficacy, citizen engagement, access to and development of talent, GDP growth. There are several models but here are two:

-Creating Account Aggregators or India's Open banking Eco-system: The India Stack has an important layer called the consent layer which is a personal data management for seamless consumption of personal data while ensuring privacy and security. The execution tool of the consent mechanism is the Account Aggregator who provides full control to the consumer on data sharing their personal data. These Account aggregators are private sector players to whom India's central Ban provides operating licenses and this effort is coordinated by an NGO called Sahamati – a triangular collaboration model. (See *Annexure 1*)

-Private foreign players like Stripe, a payments platform, simply needs to obtain a license from the Reserve Bank of India, to operate as an account aggregator on DPI, without payment – unlike its business model in advanced western economies (See *Account Aggregator Case Study, Annexure 1*)

1. **Digital Payments:** India's DPI, the Unified Payment Interface (UPI) created a new digital payment industry. Through the BHIM app. private entities were able to build their own UPI-based digital payment platforms or apps to enter the digital payments market. Google Pay, Phone Pe are examples. The role played by fintechs and MNCs in introducing these UPI based payment apps during the pandemic made them an indispensable part of the fintech ecosystem.
2. **Verifictaions:** The government of India then permitted financial services, NBFCs, banks, insurers etc. to avail the Aadhaar-based authentication services of the Unique Identification Authority of India (UIDAI) for digital KYC. The Indian startup ecosystem quickly adopted this and built on it with their expertise in artificial intelligence and algorithms. They introduced new services like providing video KYC, document verification and facial recognition software, enabling institutions that need to perform digital KYC with instant verification - quick, efficient, regulatory compliant, safe, paperless and contactless service. This is particularly necessary for a country like India where lack of literacy makes voice and video services essential. In addition to the digital KYC, such efforts were also made with DigiLocker, another significant DPI in India. The latter has enabled multiple startups to provide quick and authentic verifications, be it for employment verifications or to determine credit risk and fraud risk for digital lending.
3. **Domino Effect of benefiting multiple industries:** Online services, e-commerce and online marketplaces especially benefitted during the pandemic. Online services without digital payments and only cash would have failed with citizens not being able to step out to withdraw

cash during a lockdown. The customer habits developed then have now become embedded. - DPI with private sector collaboration creating a multiplier effect.

4. **Financing DPIs** is a problem still being solved for by many countries. Predominantly, initial financing has come from governments. But were governments to completely finance the entire cycle of implementation, cost would be prohibitive and creativity would suffer. The contribution of the private sector becomes crucial in financing the innovation, scalability and sustainability of DPIs.

An example of the private sector's contribution is **M-Pesa**. M-Pesa in Kenya is a small-value electronic payment system that is accessible from ordinary mobile phones. It was a collaboration of multinational private telecom players Vodafone, largest local internet service provider Safaricom, UK government's department of International Development and the Kenyan government, in 2010. Today, half of all transactions in Kenya take place through mobile money, and M-Pesa dominates all of it. The private sector has demonstrated via M-PESA the objective of leveraging mobile technology to extend financial services to large segments of unbanked poor people, thereby making it equitable.

Brazil's **Pix**, a fast-payment system introduced by the central bank in 2020, is growing exponentially. In 2021, Pix saw 1.2 million transactions per month, a fourth of India's UPI, but the value of the transactions of both were an estimated \$100 million each. Brazil's system is closest to India's. Pix now provides 85% of its population access to financial services. Pix is now also being used to pay for social programmes like CadUnico and Bolsa Familia .

Ukraine's **DIIA** is a DPI established in 2020, to enable the private tech sector to collaborate in innovation in a Digital Free Economic Zone². During the war, DIIA has helped citizens of Ukraine to continue to have key identity documents in digital format which they may have lost in physical form during the war. This has particularly helped in their mobility and search for safety in other countries.

Based on the success seen in fintechs driving financial inclusion using DPIs, India is now taking a giant step forward: implementing DPIs in the health, education and agriculture sectors. Agri-techs were already ready in February 2023 when Finance Minister Nirmala Sitharaman announced DPI for agriculture. The collaboration of the private sector has already been sought, through accelerator funds for startups in rural areas. The next green revolution is expected to be a digital green revolution.

² "DIIA City", PR NewsWire, as accessed on 27th July 2023, <https://www.prnewswire.com/news-releases/ukraine-launches-worlds-first-virtual-business-country-for-creative-economy---diia-city-301136975.html>

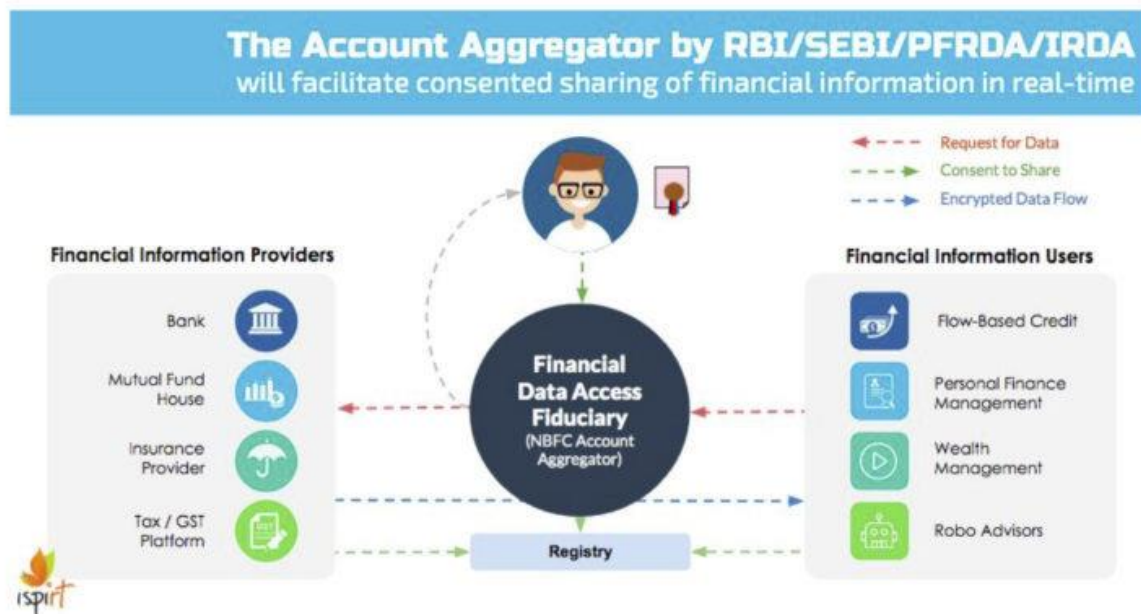
PART 4

Case Study on an Indian DPI: The Account Aggregator

By Madhumita Prema Ramanathan

Introduction

In 2021, India introduced a new digital public infrastructure called the Account Aggregator (AA) to provide customers with control over their financial data. The AA framework enables individuals and businesses to securely and easily access and share their financial data across financial institutions, such as banks, mutual funds, insurance companies, etc. This case study explores the history, benefits, risks and controls, adoption and the future of India's Account Aggregator framework.



History of Account Aggregator

Data Empowerment and Protection Architecture (DEPA) is a 'new approach, a paradigm shift in personal data management and processing that transforms the current organization centric system to a human-centric system'. By giving users control over how their data is used and enabling seamless accumulation and consumption of personal data while ensuring privacy and security, DEPA offers users access to better financial services. DEPA is more commonly known as the 'Consent Layer of India Stack'. The execution tool of the consent mechanism based on DEPA will be the account aggregator. The rollout of DEPA for financial data is taking place through Account Aggregators that are licensed by RBI. It already covers all financial assets data, liabilities data, and telecom data.



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In 2016, the Reserve Bank of India (RBI) set up a working group to examine the feasibility of creating a framework for AAs. In 2018, RBI issued guidelines for the AA framework, which included the establishment of a network of licensed entities to act as intermediaries between financial information providers and consumers. The RBI mandated that AA entities should comply with strict security, data protection, and privacy standards.

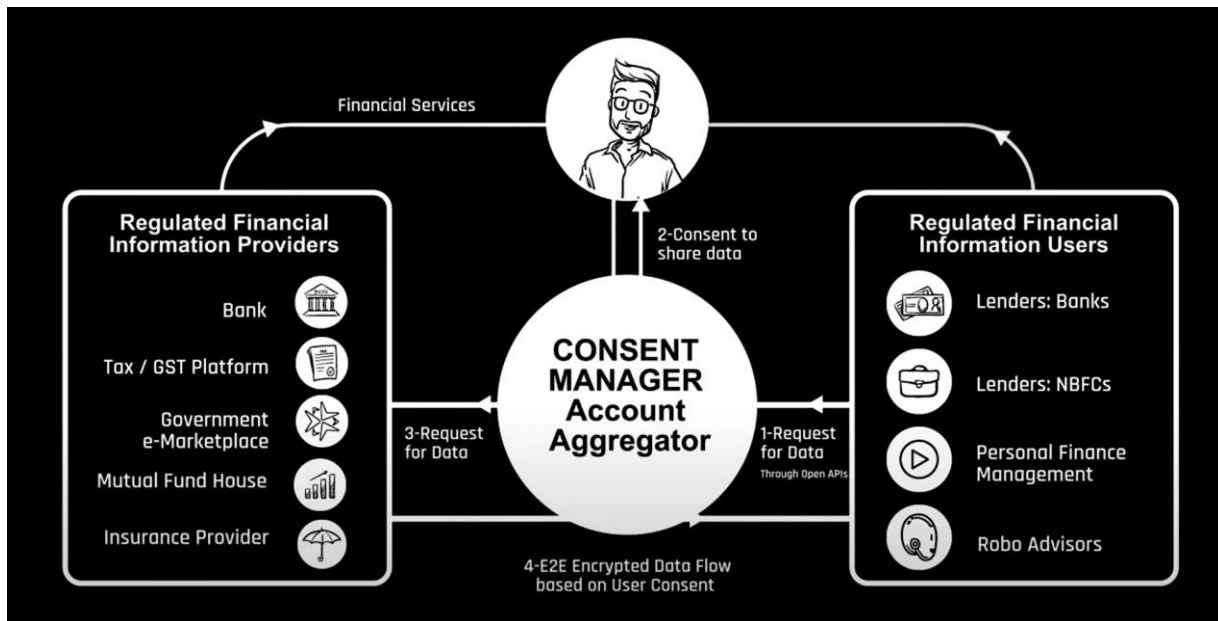
How does an Account Aggregator work?

The end-to-end cycle of operating an AA for a particular service between the customer and a financial service institution is explained below.

To start the process, customers will have to register with an AA service provider, they can choose any of the current service providers who have the license to operate as an AA. The AA service provider will verify the customer's identity using digital KYC (know your customer).

1. Once registered, customers can link their financial information providers (FIPs), such as banks, mutual funds, insurance companies, NBFCs, pension funds etc., to their AA account. The AA service provider will send a request to the FIPs for access to the customer's financial data.
2. Customer then needs to grant consent to the AA service provider to share their financial information. The customer has the choice to be able to share specific data or a complete financial profile as per the requirement.
3. The AA service provider will send an authorization request to the FIPs for access to the customer's data. The FIPs will verify the authorization request and share the required data with the AA service provider.
4. The AA service provider will collect the data from the FIPs and present it to the customer in a structured format. The customer can then share the data with the financial institution of their choice.

³ More details may be found at Sahamati, as accessed on 27th July 2023, <https://sahamati.org.in/tsp/>



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The AA framework operates on the principle of consent-based data sharing, where customers have complete control over their financial data. The customer can revoke consent at any time, and the AA service provider will inform the FIPs to stop sharing data.

The framework is designed to ensure that customers' privacy and data rights are protected. Hence, AA service providers need to ensure customer consent and that the data is all encrypted, making AA service providers data blind.

What are the benefits of Account Aggregator?

The Account Aggregator framework has several benefits for individuals and businesses.

1. AA provides customers with control over their financial data, allowing them to access and share it as they see fit. This means that customers can leverage their financial data to gain access to better financial products and services. For example, they can easily share their financial data with loan providers, allowing them to get better loan offers based on their financial history. Similarly, it helps businesses to gain better insights into their financial position, enabling them to make more informed financial decisions. The AA framework includes provisions for customer consent, ensuring that customers must give explicit consent for their data to be shared. Additionally, the AA framework allows customers to revoke consent at any time, ensuring that they have control over their data.

2. AA framework improves the overall efficiency of financial systems. It eliminates the need for customers to physically provide their financial data to financial institutions, which can be time-consuming and cumbersome. Instead, customers can grant access to their

⁴ "Account Aggregator", Tech Crunch, accessed 27th July 2023, <https://techcrunch.com/2021/09/02/india-launches-account-aggregator-system-to-extend-financial-services-to-millions/>.

financial data through the AA network, allowing financial institutions to retrieve the data they need quickly and efficiently.

3. **Cost Efficiencies:** The AA framework can help reduce costs for both financial institutions and customers in several ways:
 - a. **Operational Efficiencies** - Financial institutions can access the customer's data from a single location rather than collating from multiple locations. Data sharing from a single point, therefore enables financial institutions to reduce manual processes, improve operational efficiency and reduce costs.
 - b. **Ease of customer onboarding** - customers can grant consent to share their data with multiple financial institutions at once. This reduces the time and costs associated with customer onboarding, such as collecting and verifying KYC documents.
 - c. **Bad debt and credit risk management** - Lenders can make a more informed decisions about their customers' creditworthiness, by accessing a customer's complete financial data provided via the AA framework, reducing the risk of defaults and fraud.

Therefore, AA can be effectively used by the customer to provide financial data which can then be used by

1. Insurance providers to better assess their risk profile and underwrite insurance policies more accurately
2. Pension providers to build the best pension plans based on a customer's financial data, by fintechs to provide innovative and customised financial products.
3. Digital lenders to credit underwrite loans making it simpler, easier and quicker to access credit for the customer whilst making it quick and accurate to verify, credit profile and also detect fraud for the lending institutions.
4. Investment managers to help make a sound plan for the customers to invest and therefore help with the personal finance management of customers.

The AA framework has the potential to revolutionize the way financial services are delivered in India by enabling secure and easy sharing of financial data between different financial institutions, thereby unlocking new opportunities for innovation and improving financial inclusion.

How can the Private Sector Benefit from the AA DPI?

The private sector can leverage the AA infrastructure to help with improved customer services, innovative and personalised products for their customers. For example:

Credit Risk Assessment: Banks, NBFCs, finechs can use the AA infrastructure to access a borrower's financial data from multiple sources, enabling them to make better-informed decisions about the borrower's risk profile. This can help with improved decisioning to underwrite loans or credit products and offer better interest rates to the borrowers.

Enhanced Customer Experience: Lending institutions can use the AA infrastructure to create a seamless and unified customer experience across multiple financial services. For example, a digital lending company could use the AA framework to provide customers with a single dashboard that aggregates their financial data from multiple sources. Huge help to the borrowers in providing multiple documents - paperless, contactless and consent based sharing of data.

Bespoke Financial Products: Financial institutions can use the AA infrastructure to create personalized financial products based on a customer's financial data. For example, an NBFC or mutual fund company could use a customer's investment data to create a customized investment portfolio.. As another example, a fintech company could use a customer's transaction data to offer insights on their spending patterns and suggest ways to save money.

Risks & Controls in an Account Aggregator

Cybercrime and data breach are the first that come to mind when a digital data management infrastructure is envisioned. The AA framework is designed to be secure, and AA entities are required to comply with stringent security and privacy standards to prevent data breaches.

The account aggregators cannot see the data but only take it from one financial institution to another based on the individual's consent. Since the data shared is also encrypted, the process is much more secure than sharing physical copies of documents.

The AA framework is designed to protect customers' privacy and data rights, and misuse of data by the FIPs, FIUs or AAs. The AA framework includes provisions for customer consent, ensuring that customers must give explicit consent for their data to be shared. Additionally, the AA framework allows customers to revoke consent at any time, ensuring that they have control over their data.

Adoption and Success of Account Aggregator in India

Its still early stages of AA in India, but indications of success are already being witnessed with the rapid adoption of AA by the number of AA service providers, number of firms applying to become AA providers, number of financial institutions adopting AA and the number of consumers using AA.

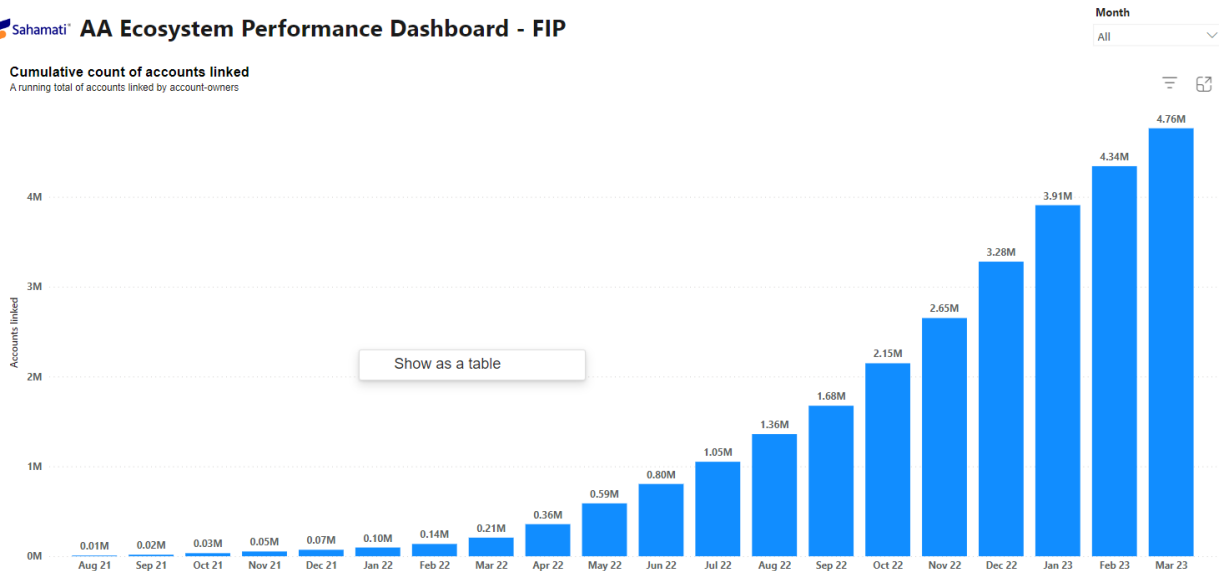
Within just 20 months of the launch of AA there are 10 licensed AA service providers in India, and many more are in the pipeline, having received in-principle approvals already.

The charts below illustrate the successful adoption of AA by customers, as they find it convenient to access and share their financial data through a single platform, and also having control on the data they would want to share.

Cumulative Count of Accounts Linked by Account Holders

Sahamati AA Ecosystem Performance Dashboard - FIP

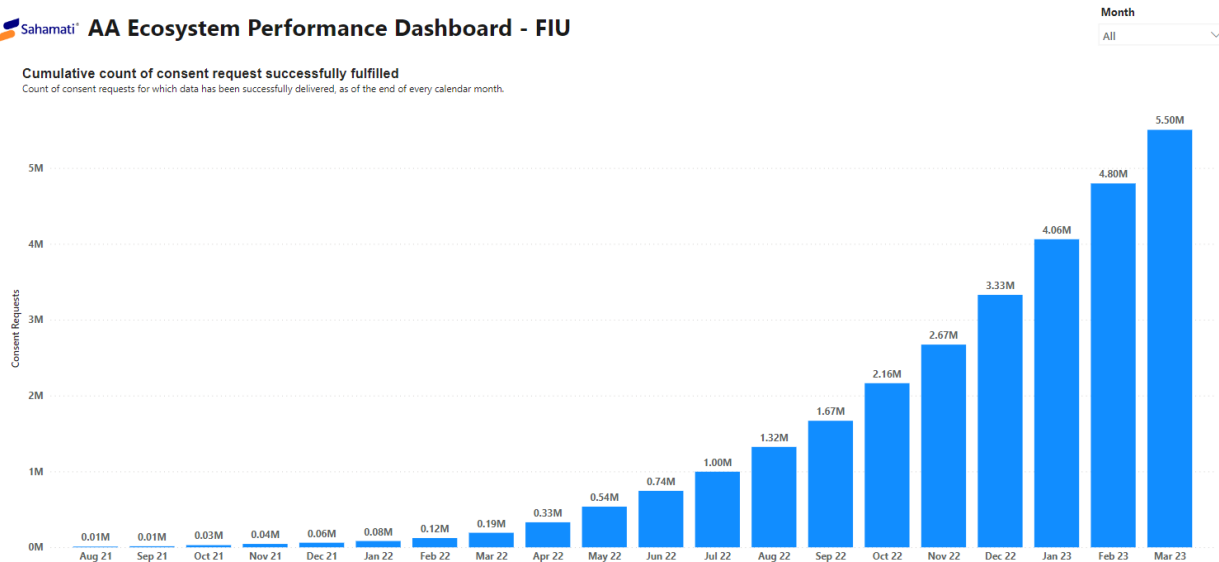
Cumulative count of accounts linked
A running total of accounts linked by account-owners



Cumulative Count of Consent Requests Successfully Fulfilled

Sahamati AA Ecosystem Performance Dashboard - FIU

Cumulative count of consent request successfully fulfilled
Count of consent requests for which data has been successfully delivered, as of the end of every calendar month.



Several financial institutions (all the public sector banks, large private banks, large NBFCs etc.) have integrated with the AA framework to render services to their customers.

Next Phase in Account Aggregator

The next phase in the AA digital public infrastructure is for the entire population to know about AA and its uses and scale up. For AA to further scale up, a large scale awareness program needs to be conducted. Partnerships, digital marketing, financial education

programs, and public awareness campaigns need to be conducted. The government, RBI, financial information users, financial information providers, and AA service providers should all take equal responsibility in educating the mass of India.

Conclusion

AA is a path breaking innovation by India contributing to the advancement of India's digital public and financial infrastructure and is an effective tool that will complete the third layer of the India stack. AA is designed to be secure and quick to share the customer's financial data, thereby making an efficient and safe ecosystem protecting against cyber threats and data breaches. Overall, AA is an effective digital infrastructure that could serve as a model for other countries looking to advance their financial infrastructure.

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