UG Capstone Project

Role of Unified Digital Interface- Account Aggregator

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Terms and Conditions:

The Capstone Project involves conducting interviews of two different companies, Dashboard and CamFinServ who agreed to share the information about their business for the project study. We have maintained confidentiality through-out the feasibility study.

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UNDERTAKING

We, all the members of the group, agree that we have followed all the instructions given by the committee to fulfill the capstone project and have made the best efforts to align with the policies of the capstone committee. We are grateful for all the help received from Ahmedabad University faculties especially Professor Hetal Jhaveri and Professor Pranav Shah for helping us throughout the project.

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CERTIFICATE

This is to certify that the Capstone Project entitled "Role of Unified Digital Interface- account aggregator" submitted by the students team to the Capstone Projects Office, Undergraduate College, Ahmedabad University, Ahmedabad – 380009, for the partial fulfillment of the requirements for their Undergraduate Degree and is their original work, based on the results of the investigations carried out independently by them during the period 11/22 to 05/23 of the study under the supervision of the Faculty Mentor Professor Hetal Jhaveri at Ahmedabad University.

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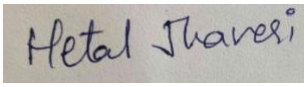
This is also to certify that the above said work has not been previously submitted for the award of any degree, diploma, or fellowship in any Indian or Foreign University.



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Date: May 31, 2023

Place: Ahmedabad

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ABSTRACT

This capstone project delves into the role and significance of a unified digital interface, specifically within the context of account aggregation. With the introduction of open banking and the growing need for seamless financial data management, a unified digital interface serves as a vital component in empowering individuals to access and manage their financial information efficiently and securely.

Throughout the project, extensive research and analysis are carried out to understand Account Aggregation as a service under Indian economy and to know the benefits, challenges, and potential impact of unified digital interfaces in the realm of account aggregation. By exploring real-world account aggregators companies, we were able to identify future of account aggregator in Indian financial services market, coexistence of different financial services like account aggregation, UPI, BHIM, along with traditional banking services, how customer is benefitted by account aggregation, and comparison of existing account aggregator companies. We also did case studies of leading two account aggregators (AA) companies in India, learnt about AA's business strategy, its working, its target audience, its IT infrastructure, safety rules and regulations and its overall revenue model.

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TABLE OF CONTENTS:

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LIST OF TABLES AND FIGURES:

1. Introduction to Open Banking System

Open banking is additionally referred to as "open bank data". The banking practice known as "open banking" enables third-party financial service providers unrestricted access to customer banking, transaction, and other financial data from both banks and non-bank financial institutions (APIs) through the use of application programming interfaces. Through the use of open banking, consumers, financial institutions, and outside service providers will be able to network accounts and data from various establishments. Open banking is quickly establishing itself as a major innovation engine that has the potential to revolutionize the banking industry.

With open banking, businesses give access to and control over their customers' personal and financial information to outside service providers, most often tech startups and online financial service providers. Typically, customers must provide the bank with some sort of authorization, like checking a box on a terms-of-service screen in an online app. The client data that has been provided (together with details regarding the client's financial counterparties) can then be used by third-party providers APIs. Data from participating financial institutions and customers may be combined to create marketing profiles, and new transactions and account adjustments may be made on the client's behalf. The customer's accounts and transaction history may be compared to a variety of financial service options.

1.1 The role of financial information providers and financial information Users:

In database systems of financial institutions, governmental institutions, and several other corporate entities, data about an individual or entity is typically fragmented and dispersed across silos. With the consent of the user whose data is being shared, there are no frameworks for easy,

secure, and efficient data sharing between financial information providers (FIPs) and financial information users (FIUs). In addition, it is difficult to find goods and solutions that can combine and integrate user data for a seamless, comprehensive view of data in real time. As a result, there continues to be opposition to data access and collaboration, and a great amount of fragmented data is not successfully optimized to give full service to users.

In this ecosystem of account aggregator (hereinafter referred to as **"AA"**), Customers and all the other entities, which are governed by RBI, SEBI, IRDA and Pension Fund Regulatory and Development Authority (PFRDA), can participate as a **Financial Information Provider** and **Financial Information User** as briefly discussed below:

1.1.1 Financial Information Provider (FIP)

FIP is a regulated entity that seems to have access to a person's financial information and commits to share that financial data upon request from a Financial Data User, as per Section 3(xi) of the NBFC-AA Directive, 2016 (the Regulation). FIPs comprise banks, banking companies, NBFCs, asset management firms, insurance companies, insurance repositories, pension funds, and other organizations that the bank may occasionally designate for the purposes of these guidelines.

1.1.2 Financial Information User (FIU)

FIUs, which request access to a person's financial data from a FIP in order to provide services to the end customer, including such market assessment, customer analysis, creditworthiness assessment, etc., are regulated organizations by regulatory agencies, such as RBI, SEBI, IRDAI, and Pension Fund Regulatory and Development Authority (PFRDA), according to Section 3 of (xii) of the Regulation.

1.2 Introduction to Account Aggregation

Account aggregation, also known as financial data aggregation, is a method for aggregating information from multiple accounts into a single location, such as bank accounts, credit card accounts, investment accounts, and other consumer or company accounts. This can be performed by connecting to the financial institution via an API or by "screen scraping," which involves a user providing the essential account-access information for an automated system to gather and combine into a single page. Users' faith in the service is dependent on the security of account access details as well as financial information.

It is also the process of gathering information from several (or all) of an individual's or household's financial accounts into a single location. For example, an online banking service may offer a home page where account holders can access information from all of their checking, savings, CD, and brokerage accounts. Personal finance software, applications, and internet services such as Quicken and Mint also offer account aggregation services.

1.3 What Account Aggregators can do.

In India, account aggregators (AA) are licensed by the Reserve Bank of India (RBI) and are regulated under the Payment and Settlement Systems Act, 2007. Here are some things that account aggregators can do in India:

1. **Collect financial data**: account aggregators in India can collect financial data from different sources such as banks, mutual funds, insurance companies, pension funds, tax authorities, and other financial institutions.
2. **Share financial data**: account aggregators in India can share the financial data of their customers with other financial institutions with the customer's consent. For example, if a customer wants to apply for a loan, they can authorize their account aggregator to share their financial data with the lender.
3. **Manage consent**: account aggregators in India are responsible for managing customer consent for sharing their financial data. Customers can revoke their consent at any time.

4. **Provide insights:** account aggregators in India can provide insights to customers on their financial health, such as their spending patterns, savings habits, and investment portfolio.
5. **Facilitate financial transactions:** account aggregators in India can facilitate financial transactions, such as paying bills or making investments, through their platform.

Account aggregators in India can help customers manage their finances more efficiently by providing a comprehensive view of their financial data and facilitating financial transactions.

1.4 Need for Account Aggregation

The account aggregator will help in increasing financial literacy in the country as it provides a secure and smooth system between FIPs (financial information providers) and FIUs (financial information users). All the aggregation of your financial data is great convenience for customers as it will save them the hassle of logging on to different accounts each time. Financial planning is made easy as one's history and record of investments is available in one place which helps in

taking informed decisions. In the Indian financial system, a consumer still has to take care of physical copies of important documents which are to be shared with various entities. This can include bank statements and various documents which have to be notarized and scanned before submitting. And then these physical copies are to be submitted to the bank which is a task for the bank as they see these copies are stored properly and not misplaced as well as are authentic and fraudulent. An account aggregator makes this task easy for both parties as this will be replaced by an easy and secure digital system which would not require so much paperwork.

1.5 Who can be an Account Aggregators

In India, to become an account aggregator an entity has to obtain a license from RBI and work according to the framework and guidelines of RBI in our country. An entity which identifies as a company can work as AA. Here company is defined as per RBI act.

Another condition is that non-banking financial companies should have at least 2 crore or higher. Some other criteria are:

a) resource availability with company

b) adequate capital structure

c) fit and proper promoters

d) secure information technology,

e) will serve public interest and

f) leverage ratio not being more than 7.

1.6 Target Audience of AA:

AA platforms cater to a wide range of audiences, including:

1. **Individuals:** Many people have a variety of financial accounts, including checking and savings accounts, credit cards, and investment accounts. Individuals who wish to watch their spending, track their assets, and manage their money more efficiently should utilize account aggregators.
2. **Small company owners** often have many financial accounts, such as business bank accounts, credit cards, and payment processing services. Account aggregators may assist company owners in tracking cash flow, monitoring spending, and reconciling accounts.
3. **Financial advisers** often engage with customers who have investments spread across various financial institutions. Account aggregators may assist advisers in consolidating financial data for their customers, tracking their assets, and providing personalized advice.
4. **Large organizations:** Complex financial reporting requirements are common for large organizations with several business divisions or subsidiaries. These organizations may

benefit from account aggregators by consolidating their financial data and streamlining their financial reporting procedures.

Account aggregators are beneficial to anybody looking to combine their financial data, simplify their financial management operations, and acquire a more comprehensive perspective of their money.

2. Literature Review

1) An Empirical Study on the Intention to Use Open Banking in India

This study employs the technologies Readiness and Acceptance Model (TRAM) to examine how open banking technologies will be used in India's developing economy. A study used a structured questionnaire to collect data from 945 clients, and the PLS-SEM method was used to analyze the results. The findings reveal that while discomfort has a negative impact on perceived ease of use and perceived usefulness of open banking technologies, optimism and innovation favorably influence both. Perceived usefulness is negatively impacted by insecurity, but not perceived usability. The likelihood of using open banking technologies is significantly predicted by perceived consumer value. The relationship between perceived customer value and usage intention for open banking is moderated by the stickiness to traditional banking.

Fintech, which combines technologies and banking and insurance, is widely employed in the sector to improve client satisfaction and operational effectiveness. Through open application interface platforms, banks may safely share consumer data in real-time with other businesses or mobile apps thanks to the emerging fintech innovation known as "open banking." New business models and improved customer service are made possible by this data sharing.

Key Outcomes:

- Open banking has several benefits, including helping banks become more customer-centric and saving money. Regulatory reforms and competitive pressure are pushing banks in this direction.
- The demonetization of currency in India led to a shift in consumer behavior and significantly accelerated the uptake of digital payment methods.

- The Digital India Programme has established an atmosphere that will be favorable for the upcoming rollout of digital banking services like open banking.

2) Open Banking: Emergent roles, Risks & Opportunities

This paper explores various open banking initiatives. Important questions about the future function of banks as well as the difficulties and possibilities presented by the new open banking environment are raised by these projects. Four open banking jobs have been identified as a result of the research: integrator, producer, distributor, and platform. Overall, the report offers fresh perspectives on how the retail banking sector will adjust to new service innovations and expanded partnerships with outside fintech.

Key Outcomes:

- Open Banking and Open APIs have attracted little to no academic research. The goal is to better understand how developments in the retail banking industry will be impacted by open banking. It also focuses on how retail banking is changing and what new responsibilities, difficulties, and risks open API will bring about.
- According to some research findings, Open Banking is about allowing third-party developers to create services and applications on top of the platforms used by financial institutions. By allowing more stakeholders, such as Fintech companies or giant companies, to create reusable and modular banking services, open banking 'opens up' systems to third-party developers and distributors of new services. Similar to this, the provision of services "opens up" new markets for third parties.
- In the retail banking value chain, four generic roles—integrator, producer, distributor, and platform—are identified as a result of the two dimensions. In contrast to the role 4 platform, which is still in its early stages of development, we discovered that the majority of the larger financial institutions already perform roles 1, 2, and 3 (integrator, producer, and distributor) concurrently across many business lines.

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3) The API Economy and Digital transformation in financial services: the case of Open Banking

An application programming interface (API) is fundamentally a language that enables two computer programmes to speak to one another via a network. It functions as a predictable electrical socket that other apps may "plug in" to and use to access data or services. APIs provide a number of advantages and can be used internally by businesses to integrate various systems and communicate data across many departments, improving cooperation and efficiency. APIs can also be used to expose corporate resources to outside audiences, such as information, services, or products, extending the company's reach. APIs provide systematic data exchange, facilitating internal team collaboration and information access, increasing worker productivity, and fostering better business outcomes. Because they offer more flexibility and different possibilities, modular designs are superior to interdependent systems, resulting in a greatly scattered sector. Platform innovators like Intel Corp. created design principles to ensure interoperability across the numerous modules that were produced independently.

A potential to deploy a platform business model in the banking industry in Europe arises with the advent of regulatory frameworks like PSD2 in Asia and Open Banking in India. With the help of online automated tools and systems, banks can use this model, known as Banking-as-a-Platform (BaaP), to adopt a platform strategy and act as re-intermediaries by providing beneficial new products and services to all platform users.

Key outcomes:

- Banks must consider the advantages of the relationship for the companies and counterparties linked to their platform.
- The creation of a whole ecosystem that could be more profitable in the near future may be prevented by short-term aspirations to benefit from open APIs.
- Before reporting its first annual net profit in 2015, Amazon invested billions of dollars over many years to expand their platform and expand their ability to accommodate additional goods and services.

- Banks should view open APIs as an opportunity to improve connectivity with customers and the rest of the industry rather than a burden in order to reap the long-term rewards.

4) Regulation of information flows as central bank functions? Implications from the treatment of account aggregators by the Reserve Bank of India.

The piece "Information flow control as a central bank function? Consequences of the Reserve Bank of India's treatment of account aggregators "by Malavika Raghavan and Anubhutie Singh investigates how the Reserve Bank of India regulates AA, which are organizations that combine financial data from numerous accounts held by a customer in various banks or financial institutions.

The authors contend that because central banks are in charge of safeguarding financial stability and consumer safety, the regulation of information flows is becoming an even more crucial task for them. They point out that using AA services raises questions about data security and privacy as well as the possibility of client data being used improperly.

The Reserve Bank of India developed the regulatory framework for AA in India in 2016, and the article offers a thorough study of it. The authors look at the numerous conditions that AA must fulfill in order to obtain a license from the central bank, such as those pertaining to governance, technical infrastructure, and data protection and security.

The authors also point out some of the difficulties AA had in complying with these rules, namely the requirement to set up secure data transfer routes and the challenges in getting consumers' permission to share their data. The regulatory framework for AA, they contend, serves as an illustration of how central banks might employ their regulatory authority to control the risks related to information flows in the financial system.

Overall, the article offers insightful information about the function of central banks in controlling information flows and possible effects on the financial system. In order to solve the issues brought on by the expanding usage of fintech services, policymakers and regulators in other jurisdictions should learn from the authors' analysis of the regulatory environment for AA in India.

Key Outcomes:

- According to a World Bank analysis from 2020, digital financial services have the potential to increase financial inclusion and support economic growth, but they also bring with them new concerns for consumer protection, data privacy, and cybersecurity. According to the research, regulators and supervisors have a crucial role to play in guaranteeing the integrity and security of digital financial services.
- According to a Deloitte survey conducted in 2021, 89% of Indian consumers are worried about the privacy of their personal information and 84% are worried about the security of their financial information. The survey also revealed that 73% of consumers are open to sharing their financial information with other vendors in exchange for improved goods and services.
- account aggregators must get a license from the central bank and abide by stringent technological and operational criteria, according to rules released by the RBI in 2016. Account aggregators are also forbidden from utilizing client data for any reason other. than providing the requested services, and they must protect the privacy and security of all data.
- In India, there were five licensed account aggregators as of January 2021, and numerous more were applying for licenses. These businesses offer services ranging from managing personal finances to applying for loans and giving financial advice.

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5) Account Aggregation Tools: History and use for the future

The paper focuses on AA which has a long history, dating back to the early days of online banking and financial management applications. The authors then investigate how AA systems have grown over time, becoming more complex and capable of merging with a broader range of financial goods and services.

For future use there are a number of issues associated with AA tools, such as the necessity for strong security measures to secure user data and the possibility of technological errors in data aggregation. There is a need for strong regulation and control to ensure that account aggregation systems are safe and effective for customers. The use of AAs is regulated by various agencies, including the Consumer Financial Protection Bureau and the Securities and Exchange Commission. The authors suggest that regulatory oversight is important to ensure that account aggregation tools are properly secured and protect users' sensitive financial information.

Though the idea of account aggregation has been slow to catch on, the future looks to be open to new applications of the technology. The most promising is found in the notion of virtual financial planning. As data aggregation becomes more trustworthy and precise, account aggregation can serve as the foundation for more complicated financial instruments.

The authors seek to investigate the regulatory implications of how the Reserve Bank of India (RBI) handles account aggregators, which are organizations that compile financial data from numerous sources to present a consolidated picture of a user's financial situation.

The literature review offers a thorough overview of central banks' responsibilities for controlling information flows in the financial system. The authors emphasize the significance of information flows for financial stability as well as the difficulties presented by emerging business models and technological advancements that disrupt established information flows.

The study then focuses on the regulatory strategy used by the RBI to regulate account aggregators, which combines licensing, oversight, and risk management processes. By highlighting potential trade-offs between privacy and security, innovation and stability and consumer protection and market efficiency, the authors examine the consequences of this strategy for the larger regulatory system.

Overall, the study offers a thorough analysis of the regulatory issues raised by new financial sector technology and business models, as well as the effects of the RBI's approach to account aggregators on the overall regulatory landscape. It also shows how the activities of the AAs in India are different from that of the other open banking system regimes adopted by the central banks of other countries.

The authors contend that, in order to maintain the financial system's safety and soundness in the face of technological change, central banks will need to adopt an adaptable and flexible approach to regulation.

Key Outcomes:

- To protect the security and soundness of the financial system, the RBI regulates account aggregators through a combination of licensing, oversight, and risk management procedures.
- Important problems about the function of central banks in controlling information flows in the financial system are raised by the regulatory regulation of account aggregators.
- The paper discusses potential trade-offs that could occur when regulating emerging financial sector technologies and business models, including those between privacy and security, innovation and stability and consumer protection and market efficiency.
- To maintain the safety and soundness of the financial system in the face of technological change, the authors contend that central banks will need to adopt a flexible and adaptive approach to regulation.
- The paper offers a useful case study of the regulatory issues raised by new business models and technological advancements in the financial industry, as well as how these issues affect the overall regulatory system.

6) Banks And FinTech's: How to Develop a Digital Open Banking Approach for the Banks Future.

The article looked the market evolution of Fintech, along with the rise of another mode in the banking system. It examined the changing concept, as well as offering an interesting banking case, which provides multiple perspectives into the decisions made in favor of a Banking-as-a-Platform model inside the banking industry.

This paper discusses how traditional banks have to come up with the changing technology. It further explains how it is important for a bank to keep investing in innovation rather than just providing basic services of banking like deposits, loans, etc.

The paper also discusses that how the perception of the customer is changing, and they are shifting towards the services provided by the fintech rather the banks, though banks are the safest option, and the customer has utmost trust but still now the customer are looking for faster, better, and reliable services rather than the trusted traditional services.

In addition to that the article also speaks about how the coexistence of fintech and traditional banks is necessary as the fintech after all are dependent on the traditional banks to provide various services, if the existence of any one is not there it would be difficult for others to survive.

Adding to that it has become necessary for the banks to tie up with the third parties like fintech to provide innovative and better service, the more the open information flow process is the more it would be able to attract the customers.

The case of BBVA bank in the article describes how the traditional bank tied up with the fintech proving innovative financial services was able to conquer the market and still maintain its position, the success was all because the banks believed in providing innovative and new services to the customers rather than being the best in the traditional bank market.

Key Outcomes:

- One of traditional banks' problems is that they are unable to supply or are trailing in the effective execution of a true market-oriented strategy.
- The task is to preserve the entire 'customer game' within the retail bank.
- The fundamental reason for this transition in banking and finance's role is that bank and financial services rely largely on information transformation and management.
- Allow previously excluded consumers to gain access. Excluded from the traditional financial system by enhancing infrastructure, innovating in new products, lowering costs, and allowing them to enjoy the same standards of services as other customers.

7) Consumer Issues in account aggregation

This paper discusses account aggregation as a service, which lets users access and manage all of their bank accounts in one location. The paper points out that this is a big advance for the financial services sector.
The advantages of AA are emphasized, which includes greater convenience, transparency, and competitiveness. The disadvantages of the service are also covered, including worries about data security and privacy which can occur in both online as well as offline medium. For writing this paper the author did a survey and analysis of AA's websites and found issues with that which breach the user's privacy.

It concludes on regulatory concerns connected with AA and the necessity for regulators to collaborate with industry partners to develop appropriate standards and methods to safeguard customer data security and privacy. The authorities should collaborate with industry participants to set proper standards and methods to safeguard customer data security and privacy. Emphasis has also been laid on the significance of transparency and good communication in ensuring that consumers understand the dangers of AA services.

Key Outcomes:

- All AA companies should properly disclose their terms and conditions which makes the users have trust in that company.
- All the complaints and disputes should be addressed on a real time basis so any malpractice can be tracked with ease.
- The AAs should be liable if there is an error in their website and the question is who would bear the loss if there were an unauthorized transaction? All this should be clearly communicated.

8) India's new approach to personal data sharing

India's new framework for data sharing and its possible effects on organizations and individuals are explored in the article "India's new approach to personal data sharing" by Leena Datwani and Anand Raman. The authors contend that India's approach to data security and privacy has significantly changed as a result of the framework, which was established in 2020.

The essay offers a thorough breakdown of the essential components of the new framework, which also covers clauses about data ownership, permission, and anonymization. The authors look at the many requirements that the framework places on firms, like the need to have customers' explicit agreement before collecting and disclosing their personal information.

The writers also discuss some of the opportunities and potential problems that the new framework may provide. For instance, they point out that while the framework may contribute to more accountability and transparency in data exchange, it may also result in higher compliance costs for organizations.

A variety of primary and secondary sources are consulted in this article to present a fair and in-depth review of the new framework. To bolster their claims, the writers cite pertinent legal and regulatory documents, case studies, and precedents from other nations.

Overall, the article makes a significant contribution to the body of knowledge on data privacy and protection in India. Policymakers, regulators, and other stakeholders who are interested in the changing environment of data sharing and privacy in India might benefit from its study of the new framework and its consequences for businesses and individuals.

Key Outcomes:

- According to Cisco, India will have 2.1 billion internet users by 2023, with the number of internet-connected devices increasing from 1.6 billion in 2018 to 2.9 billion in 2022. This highlights the importance of personal data to the nation's digital economy.
- According to the Centre for Internet and Society's 2018 survey, 83% of Indians support a data protection law, while 70% are concerned about their online privacy.
- A number of data minimization-related provisions in the proposed Personal Data Protection Law compel enterprises to collect only the minimum amount of personal information necessary for a specified purpose.
- The International Association of Privacy Professionals discovered that data minimization is one of the most effective ways to reduce the danger of using online transactions.
- Furthermore, this legislation includes consent-related clauses that require firms to obtain consumers' express permission before collecting or utilizing their personal data. According to a Deloitte survey, 68% of Indian consumers believe businesses do not acquire their consent before collecting their data, despite the fact that 80% would be willing to share their personal information with them in exchange for anything of value.
- Noncompliance is punishable by fines of up to 4% of a company's global revenue or up to three years in prison under the proposed legislation. This illustrates how seriously the Indian government regards data protection and privacy, and it implies that failure to comply will have substantial consequences for enterprises doing business in India.

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9) E-Aggregation: The Present and Future of Online Financial Services in Asia Pacific

- This article talks about how the customers have accepted online services in India vs Asian countries.
- The sharing of information through financial services to the third part have been started in the USA.
- People are very much open and evolving about sharing their financial data to the third party, while sharing they look about for privacy and reliability of the service.
- In the Asia pacific region, the countries adapting first these services are south Korea, Japan, and Hong Kong.
- Their traditional bank has tied up with several fintech companies to provide the service of online banking as well as services like account aggregation.
- It also talks about the bank also need to take one step further and integrate account aggregation and financial aggregation, financial aggregation is broader than AA as it provides services like payment service, online shopping, real estate services, etc.
- At the end it also talks about mobile aggregator as now 90% of the household in the developing company as per the research paper have smart phone and the current generation prefer to get their work done speedy and from one place only, so the next step to move forward for the AA companies will be integration with fintech's by including financial services and also go ahead with mobile aggregation.

Key Outcomes:

- The amount of use of application service aggregators and agent application aggregators differs by country in the current state of account aggregation services. However, it appears that agent applications will become standard in all countries.

- A comparison financial aggregation service is required for improved global financial services, whereas a relationship financial aggregation service is required for universal financial services.
- Aggregation services will become considerably more crucial as the use of Internet-connected mobile phones grows.

3. Methodology

The methodical strategy and set of techniques used in doing research or solving problems is referred to as methodology. It describes the particular actions and procedures that were taken to collect data, analyze information, and make conclusions. This study's methodology included several important procedures in order to accomplish the research objectives. To begin, a thorough literature review was undertaken in order to establish a theoretical foundation and identify important concepts and variables. This stage entailed conducting a research paper search on Google Scholar, academic journals, and other credible sources to obtain information on the research topic. Following the study of the literature, a mixed-methods approach was used to collect data. We searched the internet, looking through companies' individual websites as well as thoroughly going through the sahmati website, which supplied a substantial source of information. Following that, an interview with the heads of the AA firms was conducted. Case studies entail an in-depth examination of a specific company. To summarize, members of the team collected detailed information through interviews, going through research papers, and analysis of documents to gain insights into specific phenomena. Overall, the methodology employed in this research study allowed for a comprehensive exploration of the research objectives, combining quantitative and qualitative approaches, and adhering to rigorous ethical standards.

3.1 Objectives of our Research

- To understand the company's overall business strategy and how it differentiates itself from competitors in the market.
- To gain insights into the company's target audience and how it has been able to acquire customers so far along with understanding how the company plans to grow its customer base in the future, including any upcoming marketing campaigns or initiatives.
- To gain a deeper understanding of the company's partnerships and how they contribute to the overall business model and collecting information regarding how the company plans to expand into new markets or segments.
- To understand the company's stance on data privacy and security, and what measures it takes to protect its customers' information.

- Understanding how these companies will continue to mark its presence in future by coping up with the new technology along with new players entering into the market.

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4. Challenges faced by Account Aggregators in India

The Reserve Bank of India (RBI) has laid down guidelines for Account Aggregators (AAs) and there are certain things that they cannot do. Here are some of the key restrictions on AAs as per RBI guidelines:

1. **AAs cannot access or store customer data beyond what is required for providing the service:** AAs are only authorized to collect and share financial data with customer consent. They cannot store customer data beyond what is required for providing the service.
2. **AAs cannot use customer data for any purpose other than the service:** AAs are not authorized to use customer data for any purpose other than providing the service to the customer. They cannot sell, lease, or license customer data to any third party.
3. **AAs cannot offer any financial products or services:** AAs are not authorized to offer any financial products or services to their customers. They cannot provide any investment advice, portfolio management services, or any other financial products or services.
4. **AAs cannot collect data from non-financial sources:** AAs are authorized to collect financial data from various sources such as banks, mutual funds, insurance companies, pension funds, and tax authorities. However, they cannot collect data from non-financial sources such as social media, personal contacts, or location data.
5. **AAs cannot share customer data without explicit consent:** AAs are required to obtain explicit consent from customers before sharing their data with any financial institution. The consent must be obtained every time the data is shared, and the customer must have the right to revoke the consent at any time.

AAs are required to comply with the guidelines and regulations set by the RBI to ensure that customer data is protected and used only for the intended purpose of providing account aggregation services.

5. Advantages and Disadvantages of AA

5.1 Advantages of Outsourcing AA activities for Customers:

1. Process loans more quickly and render credit services more effective: Lenders will be able to evaluate a customer's financial history extensively and process loan applications more quickly by using the customer's consented financial data that was obtained by the AA system When a customer's financial institution is registered with the AA network, no documentation or KYC is necessary when the customer later applies for loans. The borrower simply needs to approve the AA. The person who is able to gather all the information, including KYC, and give it to the lender to whom the borrower is seeking for a loan.

2. Safe data processing: The AA framework must adhere to strong data sharing and privacy norms stipulated by the RBI. The AA system will use protected digital signatures to identify shared data. While being sent from the originating bank to the company the consumer is looking to borrow money from or purchase another financial product from, the data will be completely encrypted. An AA is data-blind since every bit of data it analyzes is encoded and can only be decrypted by the FIU that demanded the data. Data is not accessible or retained by the AA. AA determines which financial information to obtain and transmit with which bank or lender based on the customer's approval and inclination. The borrower has unlimited oversight of the information and can additionally choose one timescale during which the bank may retrieve and share the data in the system.

5.2 Advantages of using AA service for Customers:

1. **Convenience:** account aggregator services give a single platform for accessing and managing different financial accounts and services, making it easier and more efficient to track and control funds.

2. **Time saving:** Users no longer need to log in to separate financial institutions' websites to examine their account balances, transaction history, and other information because all of the data is gathered in one place.

3. **Greater transparency:** Users may get a comprehensive perspective of their financial data, including spending patterns, income, and investments, allowing them to make more informed decisions about their financial health and aspirations.

4. **Improved financial management:** By having a centralized view of their financial data, users may more efficiently monitor their cash flow, budget, and investments, assisting them in meeting their financial goals.

5.3 Disadvantages of using AA service for Customers:

1. **Security risks:** Although account aggregator services utilize extensive security procedures to secure clients' financial data, there is still a danger of data breaches and other security weaknesses that might reveal sensitive information.
2. **Technical issues:** Users may encounter technical problems or faults while linking their accounts to the aggregator platform, which may result in delays or inaccuracies in their financial data.
3. **Limited account availability:** account aggregator services may not be available for all financial institutions, which may limit the extent and accuracy of the user's financial data.
4. **Cost:** Some account aggregator services may impose fees or membership fees, which may increase the user's financial burden.

6. **Privacy concerns:** Customers may be concerned about sharing their financial information with a third-party aggregator, especially if the service is not explicit about how the data is used and shared.

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6. Comparison between Traditional Banks and AAs

POINT	TRADITIONAL BANKS	AA
Scope	Traditional financial services typically offer a limited range of products and services, such as banking, lending, and investment management	Account aggregator services focus on aggregating and managing data from multiple financial institutions and services.
Convenience	Traditional financial services require users to manage their accounts separately with each provider.	Account aggregator services provide a single platform to access and manage financial data across multiple institutions and services
Control	Traditional financial services may limit users' access and control over their data.	Account aggregator services offer users greater control over their financial data, allowing them to monitor and manage their accounts more effectively.
Innovation	They have limited standard services.	Account aggregator services are often more innovative and agile

7. Safety measures for AA

A well-known approach to dealing with the new systemic consequences of technology for communication and information (ICT) is privacy by design (PbD) Each information infrastructure should ideally be created with privacy protection in mind, with no compromises made between individual privacy and infrastructure efficiency. The PbD framework includes guidelines for such technical design.

The PbD framework is made up of 7 guiding principles that are meant to make privacy-assuring IT-interacting entities the default mode of operation. The accompanying are these recommendations:

1. **Proactive instead of reactive; preventative instead of just remedial:** Individuals' personal information must be secured by default even if they don't take any specific steps to do so.
2. **Privacy as a default setting:** Automatically sets users privacy at the highest level and users need not worry about data protection.
3. **Designing for Privacy:** Privacy safeguards must be included into IT systems and should not be considered an add-on to the service being provided.
4. **Full Functionality**: Positive-Sum, not Zero-Sum: PbD refers to achieving all valid goals, not only the privacy aims, and goes beyond merely making statements and obligations. Due to PbD's dual enabling properties, it is accessible for complete functioning, useful outputs, and benefits for numerous parties.
5. **End-to-end security:** It is required to guarantee the privacy of users' personal information. All parties concerned must have complete visibility into the business procedures and the technology being utilized with reference to their data.
6. **Visibility and Transparency:** Keep it Open It must be made sure that their actions are consistent with the stated goals.

7. **Maintaining respect for user privacy:** The individual's privacy must be given the greatest priority through robust privacy defaults, pertinent notifications, and empowering, user-friendly alternatives.

PbD principles may very well be quantified through a variety of technical approaches and methods for enhancing the privacy of the information systems, notwithstanding that they're not an official privacy paradigm within which computer systems can be evaluated. Assessing the security measures of the account aggregator system. Knowing how the primary information flows within the AA environment is crucial to determine how well AAs perform in comparison to the PbD principles. They include amongst financial information users, AAs, financial information providers, and consumers (users).

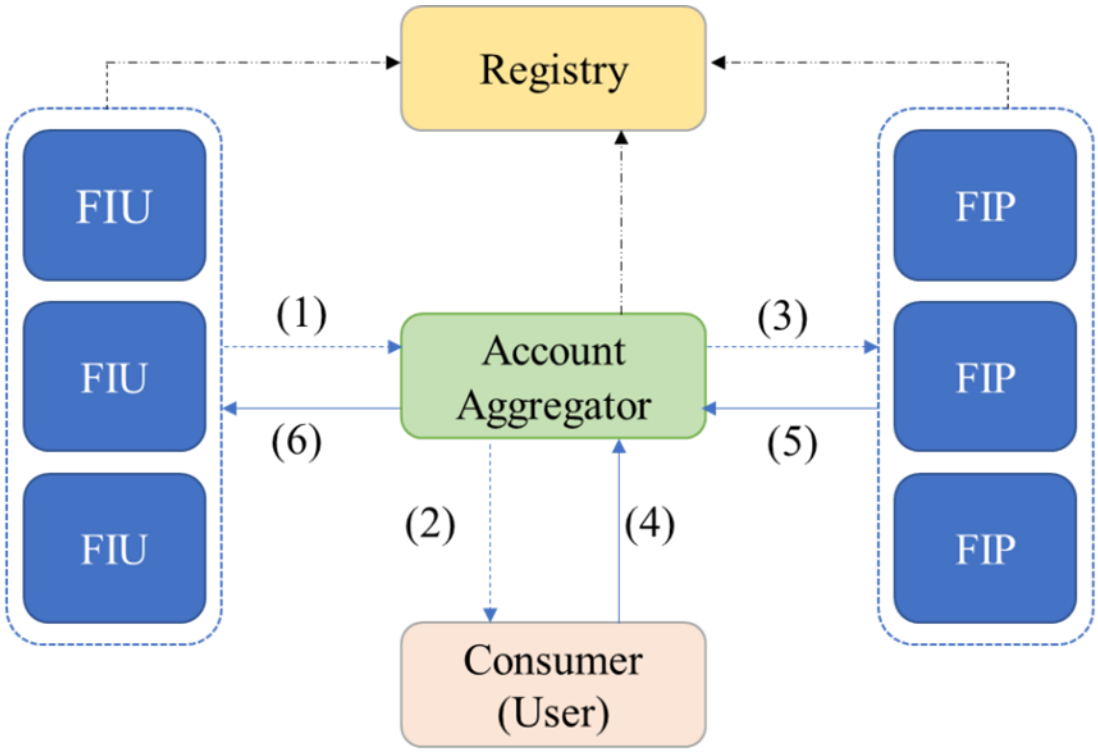

Figure 1: Query and data flows of an Account Aggregator ecosystem (authors' rendition)

Source: Tech Law Forum @ NALSAR. (2020, November 1). *Building Safe Consumer Data Infrastructure in India: account aggregators in the financial sector (part II)*. Tech Law Forum @ NALSAR.https://techlawforum.nalsar.ac.in/building-safe-consumer-data-infrastructure-in-india-account-aggregators-in-the-financial-sector-part-ii/

The three layers of queries flow that are required for the AA system are depicted in this chart.

Column 1: Query Flows	Column 2: Data Flows		
1	**FIU** queries the **AA** for **FI**	4	**User** provides **AA** with **Consent**
2	**AA** queries the **User** for **Consent**	5	**FIP** transfers information to the **AA**
3	**AA** queries the **FIP** for **FI**	6	**AA** transfers **information** to **FIU**

Source: Tech Law Forum @ NALSAR. (2020, November 1). *Building Safe Consumer Data Infrastructure in India: account aggregators in the financial sector (part II)*. Tech Law Forum @ NALSAR.https://techlawforum.nalsar.ac.in/building-safe-consumer-data-infrastructure-in-india-account-aggregators-in-the-financial-sector-part-ii/

The AA programmed,

- Within the AA environment, queries are started as indicated in Column 1 of something like the Table (from top to bottom).
- A query is a request for data or information sent by one entity to another that has a database. As an illustration, a FIU asks AA for the desired FI.
- Column 2 (from top to bottom) lists the data flows that happen in response to these inquiries, which correspond to query flows A1 through C1. The pertinent information will be encrypted and transmitted to the organizations listed in Column 2 in response to the query flow.

In the part that follows, we examine whether the PbD principles were utilized when creating the technological architecture of the AAs.

In conclusion, the AA ecosystem appears to have received the majority of security and privacy-protecting guidelines for big information infrastructures (European Union Agency for Network

and Information Security, 2015). Also mentioned are procedures for fraudulent financial pattern monitoring and external security audits. Nevertheless, restrictions on how the FIU might utilize FI once it has been acquired as well as other similar provider requirements are not immediately apparent. If a FIU were to be deemed a data fiduciary, it is unknown if they would be required to internally tell customers about data breaches that happened within their organization. The ecosystem's design doesn't appear to have any technological controls that prevent FIUs from misusing FI, and the FIUs' responsibilities under the law are judged to be unacceptable to be adequate.

The investigation of the AA architecture using the PbD framework reveals that some of the framework's principles have been largely adopted, but there appear to be a number of disconnected places where user privacy does not appear to be given priority. Given that the majority of Indians will be first-time users of such technology, or even enabling technical infrastructures like mobile phones or the internet, this is extremely vital to take into account.

The Data Empowerment and Protection Architecture (DEPA) is an admirable first step in giving Indians ownership of their private information, however it must be emphasized that consent is not sufficient in and of itself to ensure adequate accountability. In order to protect customers and their personal information, it is vital to have legal responsibilities, but there also has to be a solid technology foundation for ideas like purpose limitation and collection limitation to be codified.

Account aggregators (AA) need to implement robust safety measures to protect the financial data of their users. Some of the safety measures that account aggregators should consider include:

1. Encryption: account aggregators should use encryption to protect user data during transit and at rest. Encryption ensures that data is scrambled so that only authorized parties can access it.

2. Authentication: account aggregators should implement strong authentication measures, such as two-factor authentication, to prevent unauthorized access to user data.

3. Data Protection: account aggregators should have appropriate data protection policies and procedures in place to prevent unauthorized access, use, or disclosure of user data.

4. Monitoring and Reporting: account aggregators should have monitoring and reporting mechanisms in place to detect and respond to security incidents promptly.

Some of the key safety concerns that users should consider when using account aggregators include:

1. Unauthorized Access: Users need to ensure that they only provide their financial data to trusted account aggregators.

2. Data Privacy: Users should carefully review the privacy policy and terms and conditions of the account aggregator to understand how their financial data will be used and shared.

3. Cybersecurity Threats: Users should regularly monitor their financial accounts and report any suspicious activity immediately.

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8. Operation of AA and the System that AAs use to store data

account aggregators work based on a model with several key parts and processes, such as:

1. User onboarding: This is the process of signing up new users for the account aggregator platform. To get their financial information, the user must give their personal information and prove who they are.

2. Account linking: Users can connect their financial accounts to the aggregator's platform. The aggregator must set up secure connections with each financial institution to get the user's financial information.

3. Data retrieval and processing: The aggregator gets the user's financial data from each institution and processes it to give them a single view of their financial situation. This means the data must be standardized and normalized to ensure they are correct and consistent.

4. Data storage and security: The aggregator must keep the user's financial information safe and follow all privacy and data protection laws.

5. Data presentation: The aggregator shows the user's financial data in a way that is easy to understand. It also gives users insights and tools to help them understand their financial situation and make smart decisions.

6. Sharing data: The aggregator makes it safe and easy for users to share their financial information with other authorized parties, such as financial advisors or lenders.

The way account aggregators work is meant to make it easy and safe for users to manage their financial information across multiple accounts and institutions. Account aggregators can help users make better financial decisions and improve their financial health by giving them a single view of their finances.

account aggregators use a variety of tools to do their jobs, such as APIs to connect to financial institutions and get financial data, data cleansing and normalization tools to standardize and normalize financial data, data analytics and visualization tools to show financial data, security and encryption tools to protect financial data, identity verification and authentication tools to make sure users are whom they say they are, and compliance and regulatory tools to make sure they follow the rules.

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9. Contract AAs enter into with Merchants and Customers

Account aggregators sign contracts with both the people who use their services and the financial institutions. These contracts are important to the account aggregation ecosystem because they spell out what each party can and can't do.

9.1 Contracts with users: account aggregators usually sign contracts with their users that spell out the terms and conditions of the service. These contracts have rules about data privacy, security, liability, and how to settle disagreements. Before they can use the account aggregation service, users have to agree to these terms and conditions.

9.2 Contracts with financial providers: account aggregators also make deals with financial institutions that give them access to their users' financial information. These contracts may have clauses about data access, security, liability, and how to settle disagreements. Before letting the account aggregator look at their data, financial institutions must agree to these terms and conditions.

Account aggregators need to sign contracts with users and financial institutions to ensure the account aggregation ecosystem works well. They make it clear what the rights and responsibilities of each party are and help to reduce risks and disagreements that could happen. Also, these contracts help users, account aggregators, and financial institutions build trust, which is very important for the account aggregation ecosystem to work.

account aggregators sign different kinds of contracts with different parties and for different kinds of deals. Here are some examples of the kinds of contracts that account aggregators usually sign:

1. User agreements: These are contracts between the account aggregator and the user that spell out the terms and conditions of the account aggregation service. These contracts spell out each party's rights and responsibilities in areas like data privacy, security, liability, and how to settle disagreements.

2. **Service level agreements (SLAs):** SLAs are contracts between the account aggregator and the financial institution that say how the account aggregator can access the financial institution's data. Most of the time, these agreements have clauses about the quality and availability of the data, as well as about security, liability, and how to settle disagreements.

3. **Data access agreements:** These are contracts between the account aggregator and the financial institution that say how the account aggregator can use the financial institution's data. Most of the time, these agreements have clauses about the type of data that can be accessed, how often it can be accessed, security, liability, and how to settle disagreements.

4. **non-disclosure agreements (NDAs):** NDAs are contracts between the account aggregator and the financial institution that protect the privacy of the financial institution's data. These agreements usually say that the account aggregator can't share the financial institution's information with third parties without the financial institution's permission.

These contracts are necessary to ensure that the account aggregation ecosystem works well and that each party knows their rights and responsibilities.

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10. Analysis of Account Aggregator sector (Industry)

10.1 Swot Analysis:

SWOT analysis is a strategic tool for evaluating the strengths, weaknesses, opportunities, and threats of a certain project or business. It analyzes the internal and external factors of the company. Scanning the internal and external environments is a main component of strategic planning. Within a corporation, environmental influences are defined as Strengths or Weaknesses, while those outside the company are classed as Opportunities or Threats. A SWOT analysis is a type of strategic environmental analysis. The SWOT analysis provides important information on comparing resources and capabilities with the competitive environment in which it works. As a result, it helps in strategic planning and selection, below is a detailed SWOT analysis of account aggregator companies:

10.1.1 Strengths:

1. Convenience: account aggregator companies offer convenience to users by providing a single platform to access and manage all their financial information in one place. This saves users time and effort in managing their finances.

2. Improved Financial Management: By providing a consolidated view of users' financial data, account aggregator companies can help individuals and businesses better manage their finances and make informed financial decisions.

3. Security: account aggregator companies use encryption and other security measures to protect users' financial data, making it more secure than storing sensitive information on multiple devices or platforms.

4. Data privacy: account aggregator companies follow strict data privacy regulations and guidelines, ensuring that users' financial data is protected from unauthorized access or misuse.

10.1.2 Weaknesses:

1. Limited Adoption: Account aggregator companies are still in their early stages of adoption, and users may be hesitant to share their financial data.

2. Dependency on Financial Institutions: account aggregator companies rely on partnerships with financial institutions to access users' financial data. The lack of cooperation from these institutions can hinder the growth of account aggregator companies.

3. Revenue model: account aggregator companies have to depend on subscription fees, transaction fees, or data analysis fees as their revenue model. This can limit their revenue potential, especially in the initial stages of growth.

10.1.3 Opportunities:

1. Growing Demand: As people become more aware of the benefits of account aggregator companies, the demand for these services is expected to increase.

2. Expansion into New Markets: account aggregator companies can expand their services beyond the financial sector and into other industries, such as healthcare, insurance, and government services.

3. Data Analytics: account aggregator companies can use the data they collect to offer value-added services, such as financial advice, credit scoring, and personalized product recommendations.

10.1.4 Threats:

1. Competition: The account aggregator market is becoming more competitive, with established players and new entrants.

2. Regulatory Changes: Changes in regulations, such as data privacy laws and financial regulations, can affect the operations of account aggregator companies.

3. Security Risks: Despite their efforts to protect users' financial data, account aggregator companies are still vulnerable to security breaches and cyber-attacks. Such incidents can severely damage the reputation of the company and erode user trust.

10.2 Pestel Analysis

A PESTEL analysis is a tool used to detect the external influences that affect a business. PESTLE analysis (Political, Economic, Social, Technological, Environmental, and Legal) is a strategic framework used to analyze the external macro-environmental elements that affect a corporation or sector. It is vital to conduct a deep scenario analysis before implementing any type of marketing strategy or tactical plan.

A full PESTLE study of the account aggregator industry follows:

10.2.1 Political:

Government regulations: Companies in the account aggregator sector are subject to stringent rules governing data privacy, security, and sharing. To ensure that data privacy and security are upheld, and that data is exchanged securely, the government has established rules and procedures.

10.2.2 Economic:

Digital transformation: The account aggregator market has grown as a result of the developing digital economy. A new market that links individuals, financial institutions, and other service providers has been developed by the sector. The demand for account aggregator services is projected to rise as more organizations turn to digitization.

10.2.3 Social:

Education and awareness: Customers are becoming more knowledgeable of the advantages of account aggregator services, including simple and secure data sharing and the capacity to manage their finances more proficiently. The use of these services may increase with consumer and company education on the benefits of account aggregation.

10.2.4 Technological:

Technology advancements: The account aggregator market depends on advancements in big data analytics, machine learning, and artificial intelligence. These technologies enable data analysis, offer insights, and facilitate safe and smooth data sharing. The industry is likely to gain from fresh and creative solutions as technology develops.

10.2.5 Legal:

Data privacy laws: The account aggregator sector is subject to stringent data privacy rules, including the General Data Protection Regulation (GDPR) and other data protection legislation. To avoid fines and reputational harm, businesses must make sure they have the essential data protection safeguards in place and that they adhere to all legal obligations.

10.2.6 Environmental:

The industry for account aggregators is not directly impacted by any significant environmental issues. Yet, businesses must take care to implement sustainable practices in their operations and support the overarching objective of lessening their influence on the environment.

10.3 Porter's 5 Forces

Porter's model is based on the concept that a firm strategy must address external opportunities and challenges. A competitive strategy, in particular, should support and comprehend the industry's structure and how it is changing. Porter outlined five competitive forces that influence.

the entire industry and markets. These strengths determine the competitive strength, and thus the profitability and attractiveness of the sector. The goal of business strategy should be to modify these competitive dynamics such that the organization's position improves. Porter's model lends support to the understanding of industry driving power. Managers can determine how to influence or apply particular parts of their industry based on the information provided by the five forces.

10.3.1 Competition in the Industry:

The competition in account aggregators is very high with a large number of companies competing for users' attention and loyalty. Moreover, they also face competition from financial management tools. Additionally, financial institutions are developing their own AA services, further increasing the competition example Paytm. This increases the pressure on AA providers to bring something innovative and differentiate themselves from competitors to gain market share. The account aggregators also face competition from traditional banks.

10.3.2 Potential of New Entrants:

The potential for new entrants is high as AA is still evolving and emerging so there are less barriers to entry but after entry achieving success is relatively challenging**.** As advancement towards technology is taking place at a fast rate and everything is becoming digitalized, the potential for new entrants becomes difficult to survive. For this new entrant will need heavy investments to be done. In accordance with this there are several companies who are in the process of getting licenses from the RBI.

10.3.3 Power of Suppliers:

Account aggregator companies mainly rely on partnerships with financial institutions to access users' data. The lack of cooperation from these institutions can hinder the growth of account

aggregator companies. Even the IT security team is considered to be the supplier as they provide data privacy.

10.3.4 Power of Customers:

As the competition rises, the power of customers to select from the various options also rises. They tend to compare the rates and the security measures across different account aggregators and select the best. They may even switch to another provider if they are dissatisfied with the service or if the competitor has a better deal.

10.3.5 Threat of Substitutes:

The threat of substitutes is high as there are other ways to manage financial accounts like some banks have their own apps or one can access the financial data directly through websites. Even though there is manual record keeping, which was traditionally seen, some companies still prefer this even though it is time consuming. Personal financial management tools namely real byte money manager app, where bank account, credit card and investments are linked.

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11. Leading AAs of India

RBI has granted a 'Certificate of Registration' to companies as account aggregators to date are as follows:

- **Dashboard account Aggregation Services Private Limited**
- **Perfios account Aggregation Services**
- **Cams Financial Information Service**
- **One Money AA**
- **Finsec AA Solutions**
- **Yodlee Finsoft are the account aggregators.**
- **National E-Governance Services (NESL) Asset Data**
- **Phone Pay**

In addition, according to the RBI, 26 financial institutions have joined the account aggregator platform as financial information suppliers. There are 12 public sector banks and 10 private sector banks among them. One of them is a modest finance bank, while the other three are life insurance firms.

It should be remembered that the RBI included the Goods and Services Tax Network as a FIP under the framework of an account aggregator last month. The central bank's action is likely to increase credit flow to the cash-strapped micro, small, and medium firm sector, as well as generate new prospects for the country's fintech startups.

The account aggregator platform is one of the important parts of the government's India Stack. With India Stack, the government hopes to usher in the next level of digitalization and boost credit flow into the economy. Other key components of the India Stack are the Open Network for Digital Commerce and the Unified Payments Interface.

Nandan Nilekani, former UIDAI chairman and co-founder of Infosys, recently stated that the account aggregator structure and ONDC will drive major economic activity in India over the next decade.

11.1 Dashboard account Aggregation Services Private Limited

Saafe is a solution licensed by RBI for providing a real-time aggregated view of financial assets for individuals and businesses.

This state-of-the-art API driven solution puts one in the driver seat of managing your finances and personal wealth. It connects you seamlessly and securely with multiple financial institutions. It empowers users, consumers, and providers through swift, user-friendly sharing of financial information that is consent-based and completely secure. Harness the power of financial information to improve personal finances, finance management, access to credit, assess the creditworthiness of users and so much more.

11.1.1 Working:

Financial information is kept secure at every step of the way with 256-bit base 64 encoded nonce. Saafe does not store or analyze data in our servers, so it is never at risk of falling into the wrong hands. After each transaction it requires a PIN which makes it secure. Users can control the digital sharing of their financial information based on their consent. You can review consents for the accounts, the tenure, frequency, and the receiver of your information.

11.1.2 Pricing:

Saafe is free for users and MSMEs to view their financial asset balances from their FIPs.Saafe charges the FIUs for the data calls and this is based on the board approved policy on pricing and any preferred agreement that Saafe has with the individual FIUs.

11.1.3 Costs:

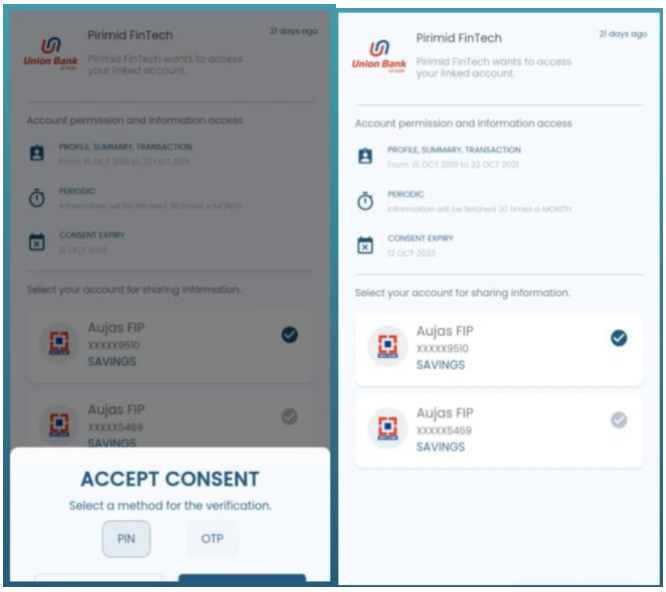
The Company may engage third party service providers to render various services (other than the core service of account Aggregation) and perform various functions in relation to the business undertaken on the Platform.

11.1.4 Target Audience:

11.1.5 Safety and Security:

The company depends on its clients to advise them of any changes to their personal information. Access to your personal information is restricted to employees who require it to fulfil your requests. The proper management of personal and private information is covered through training and information given to employees.

An OTP or Pin number to be used as a part of verification process, every time the user agrees to share information to any institution along with this it also asks for the customers permission whether they want to allow it or decline, due this process it becomes very easy for the customer to keep track of their activities.



11.2 PERFIOS Co

11.2.1 Company features and USP:

By providing a comprehensive platform that blends account aggregation with financial analytics and reporting, Perfios sets itself apart from other account aggregator businesses.

The ability of Perfios to extract, consolidate, and analyze financial data from many sources, such as bank accounts, credit cards, and investment accounts, is one of its key unique selling propositions (USP). The platform at Perfios may then give clients information about their financial health, such as pinpointing places where they can increase their financial planning or make savings.

The platform's flexibility for modification and integration is another distinctive feature. In order to create a smooth user experience, the platform can be linked with other systems and tailored to match the demands of particular industries or enterprises.

Ultimately, Perfios distinguishes itself from other account aggregator businesses thanks to its extensive platform and capacity to offer financial analytics and reporting. Perfios is able to offer useful insights that can assist people and businesses in making better financial decisions by integrating data gathering and analysis.

11.2.2 Major Target segment:

Individuals, small businesses, and financial institutions like banks and fintech firms make up the target market for Perfios. Customers who wish to manage their corporate finances, track their personal finances, and offer value-added services to their own clients can do so on their platform, which is built to meet their demands.

11.2.3 Social Media Promotion and Profiles Analysis:

Perfios posts updates on their products and services as well as personal finance-related content, such as suggestions for handling money and managing finances, on their social media platforms. Through their social media platforms, they frequently share blog articles, webinars, and other educational materials.

Perfios has previously launched social media advertising efforts in addition to its own organic social media posts. For instance, they have advertised their goods and services on Facebook and LinkedIn, which can assist to raise brand recognition and enhance website traffic.

In general, it's clear that Perfios has made an effort to use social media as a way to connect with their audience and promote their brand.

11.2.4 Safety and security measures:

Perfios implements a number of safety and security elements to safeguard the safety of their platform and the data of their clients. Perfios offers a number of safety and security features, including:

11.2.5 Data Encryption:

Perfios protects customer data from illegal access by utilizing cutting-edge encryption methods.

11.2.6 Regulatory Compliance:

Perfios complies with industry-recognized rules like ISO 27001:2013 and RBI regulations.
In order to safeguard customer information and guarantee the security of their platform, Perfios has included a number of safety and security elements.

11.2.7 IT Setup and Storage of Data

The IT infrastructure and data storage at Perfios are set up to protect the security and privacy of consumer information. The IT system and data storage details for Perfios are as follows:

11.2.8 Platform built on the cloud:

The cloud-based design of Perfios' platform allows for excellent scalability and availability. In order to host its platform, Perfios employs Amazon Web Services (AWS), which offers a safe and dependable environment for holding customer data.

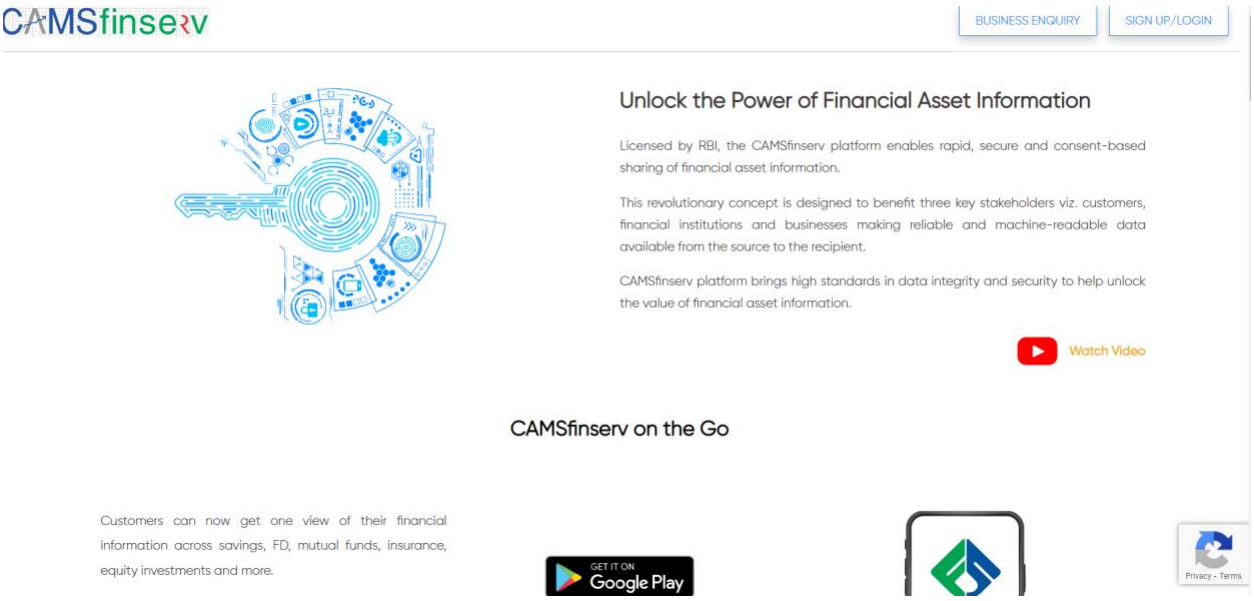
11.2.9 Data storage:

India-based safe servers are where Perfios keeps customer data. To ensure redundancy and backup in case of data loss, the data is kept in different places.

11.3 CAMS FinServ

Cams Finserv was founded in 1988 to provide various financial services, now recognized as also one of the leading companies to provide the service of account aggregation, it is co-owned by Warburg Pincus, NSE, HDFC group, Acsys. Its subsidiaries are CAMSKRA for KYC services, Sterling software, CAMSRep and CAMS finserv, it is regulated and accredited intermediary are SEBI, QRTA, RBI, IRDAI, AMFI and PFRDA for PoP. CAMS being a technology driven financial infrastructure and services provider to Mutual Funds and other financial institutions for over 25 years. The company provides the technology with providing better service solutions to Alternative Investment Funds and Insurance Companies. In addition to being a B2B service partner, CAMS also provides customers through a variety of other services such as pan-India network of service centers, white label call center, online, mobile app and chatbot.

Account aggregator service is one of the latest resolutions in the financial services industry in which CAMS finserv plays a unique role. The USP of the company is the technology it uses and the method in which it stores its client's data which is much more advanced and more reliable than most of the companies.
Below is the diagram which show how the accounting aggregator service works?



Source: *Best financial account aggregator in India: Service licensed by RBI: Bank & NBFC Aggregation Vendor*. CAMSfinserv. (2021, August 30). https://camsfinserv.com/

CAMS FINSERV COMPANY MODEL

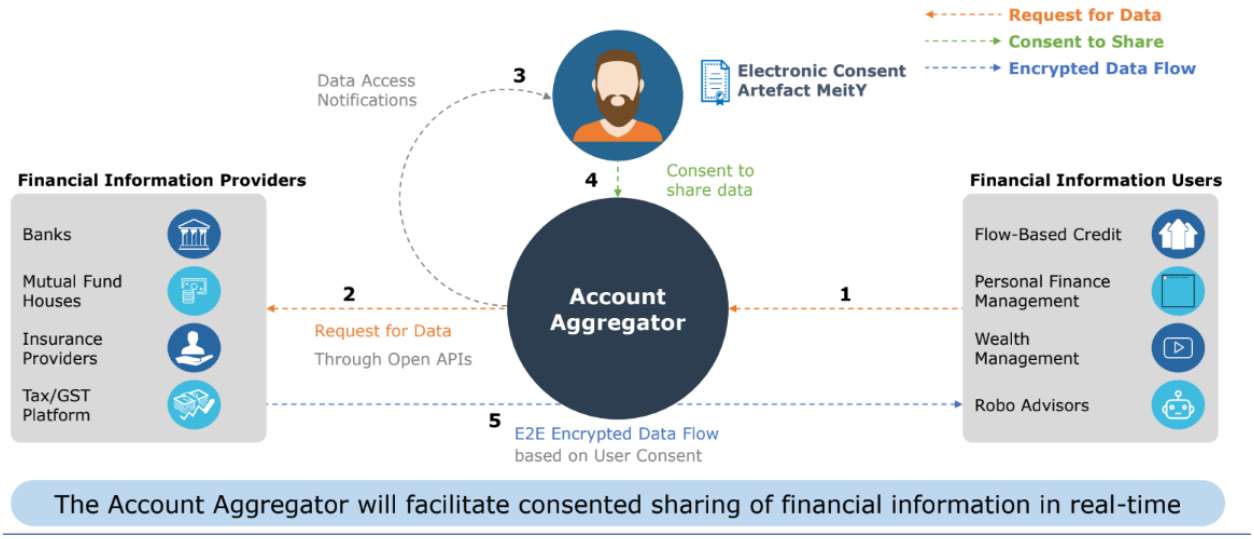
It's very simple to use the service provided by cams finserv app, as the customer just needs to download the application on their phone, set up the ID and password and can select which information they need to share it can be related to mutual funds or investments, the customer has the option to select their preferences.

After creating an account, the app asks for a pin number to be used every time you agree to share information to any institution along with the pin it also asks for the customers permission whether they want to allow it or decline, due this process it becomes very easy for the customer to keep track of their activities.

Cams finserv gives utmost importance to the security of data and customer consent which is one of the main USP of the company, for them customer consent is at the top priority.

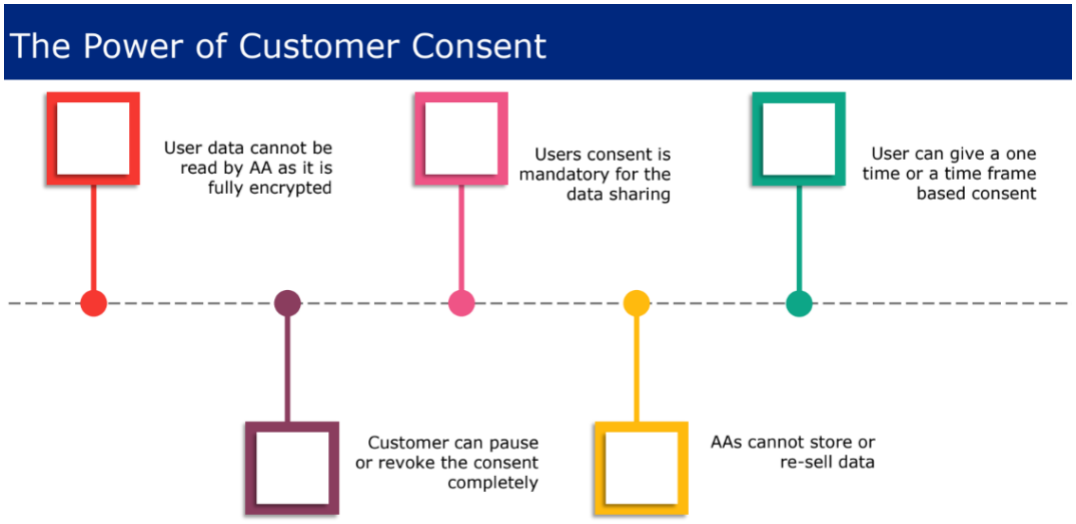
Cams finserv will collect the information from the FIP and provide it to FIU this process is seamless and done with utmost security.

The below diagram shows what is the importance of customer consent and how the company takes care of it.



Source: *Best financial account aggregator in India: Service licensed by RBI: Bank & NBFC Aggregation Vendor*. CAM FinServ. (2021, August 30). https://camsfinserv.com/

FINANCIAL INFORMATION SHARING AND CONSENT PROCESS



Source: *Best financial account aggregator in India: Service licensed by RBI: Bank & NBFC Aggregation Vendor*. CAMSfinserv. (2021, August 30). https://camsfinserv.com/

POWER OF CUSTOMER CONSENT

In providing the services the company has partnered with several institutions to prove the service related to mutual funds, PE funds, etc. currently it has 15 million mutual fund investors and 3.3 million mobile app users.

11.3.1 Target Audience:

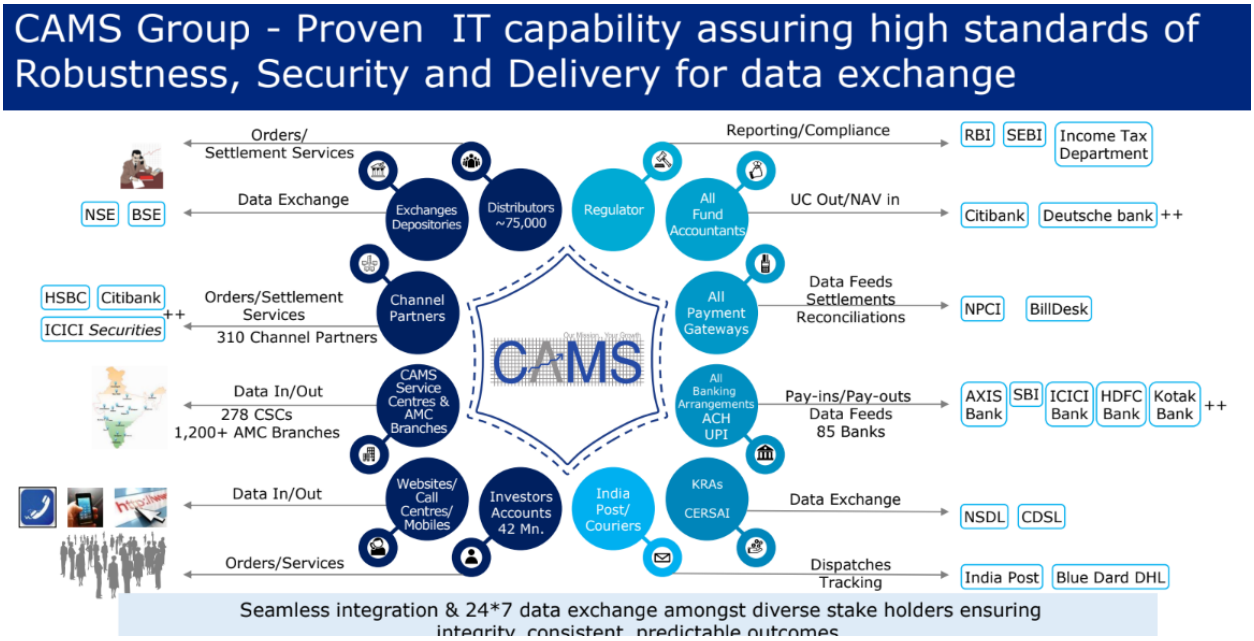
The companies major target audience are the high-net-worth individuals who are looking forward for PE investment and asset management, NBFC companies and banks, they mainly go for the FIUs and FIPs, as the company has its own subsidiary in insurance and mutual fund segment which is the main advantage of them in cost structure due to which they look for the clients who are more interested in this areas.

The main concept is to provide customized service to the customer like they are the ones to select in which sector they want to share the information and what amount of information to be shared.

11.3.2 Security and Privacy of the data:

The company uses sandbox technology and NDA to store and flow information of the data, as this technology keeps the information in an isolated place with limited access it can quickly detect any malicious data or corrupt file, so the company gets to know immediately if there has been any unwanted change in the data. After getting the data stored it double checks the contract and after checking everything twice it signs up and goes live with the customer for the service they have selected.

The below diagram shows how the company has partnered with various companies for the security of the data, on the basis that it proves that security and privacy of the customers data is the topmost priority of the company.



source: *Best financial account aggregator in India: Service licensed by RBI: Bank & NBFC Aggregation Vendor*. CAMSfinserv. (2021, August 30). https://camsfinserv.com/

CAMS IT CAPABILITY - ROBUSTNESS, SECURITY AND DELIVERY FOR DATA EXCHANGE

11.3.3 Company providing additional services in the future:

Recently the RBI has allowed the payment of GST under AA system. RBI's move to include GSTN will give an impetus to start-ups and small organizations and ease their credit procurement process.

India is witnessing a digital transformation and the account Aggregation framework will be a key-factor in India's next big digital revolution.

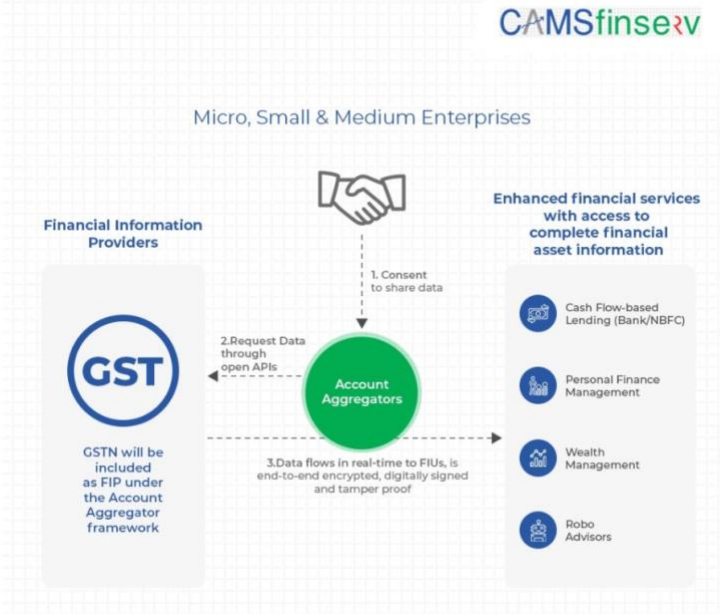
Benefits of including GST under AA are as follows:

1)Data Accessibility

2)Prevention of Fraud

3)Lending and Access to Institutional Credit

4)Ease of Accessing Creditworthiness

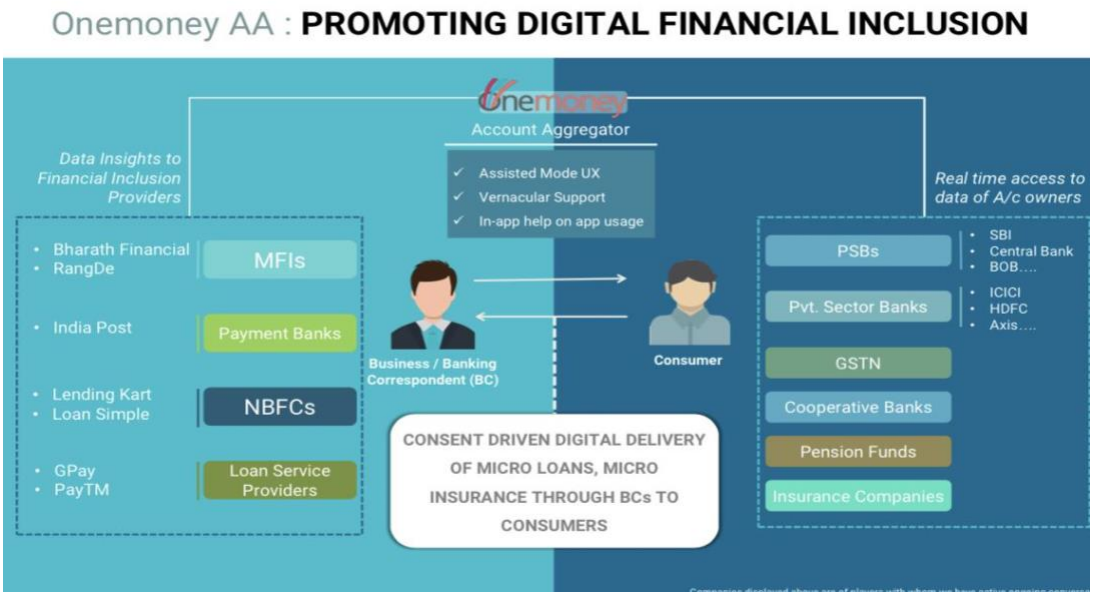


source: *Best financial account aggregator in India: Service licensed by RBI: Bank & NBFC Aggregation Vendor*. CAMSfinserv. (2021, August 30). https://camsfinserv.com/

11.4 One money

One money is India's first RBI licensed account aggregator. One Money is developing user experience tools for our users to manage their consents using a privacy-first approach. We are also developing a trustworthy API that will be used by most financial service providers in the nation for the secure, consent-driven receipt and transmission of user data. Company's goal is to give people more control over their financial information and protect their privacy. enabling secure data transfer and receipt between financial organizations and customers.

The account aggregator will facilitate consent-based sharing of financial information, in real-time. Customers or Users can easily manage their consents on mobile apps and responsive web apps. Using integration toolkits, businesses may simply include these user journeys into their digital applications. Financial institutions utilize APIs to ask their clients for permission to access their data for a certain task and duration. Consumers can grant or decline such requests using apps. Once provided, consents may also be postponed or canceled at any moment using the platform. The financial credentials of the customer are neither collected nor stored by One Money. Also, the company doesn't access, keep, or examine their financial information on our servers. All data provided with businesses and clients is completely encrypted.



Source: *Learn how you can leverage the one money account aggregation service*. Onemoney Home. (n.d.). https://www.onemoney.in/

11.4.1 Working

Customers can join one money platform in three easy steps. First step is to sign up with their developer portal. After that you can test the sandbox which allows customers to set up test data and other configurations.

11.4.2 Pricing

Pricing model of one money is “Per account” charge varying between INR 0.30 and INR 9.90, based on the type of account data. Here account data types are codified by RBI as either “Balance”, “Profile” or “Transactions' '.

11.5 Finvu

The RBI has granted Cookiejar Technologies Pvt Ltd (doing business as Finvu) the NBFC-AA certificate of registration, allowing it to perform the functions of an AA for the customer or any other financial information user in the manner prescribed by RBI. NBC account aggregators, which are governed by the RBI, provide the infrastructure and mechanism for obtaining client financial information based on consent. NBC AA oversees managing customers' consent to sharing their financial data. Financial Information Users (FIU), Financial Information Providers (FIP), Account Aggregators (AA), and Customers are all able to facilitate, share, and access information in real time thanks to the A ecosystem's secure, interoperable APIs.

An NBFC account aggregator in India with an RBI license is Finvu. Finvu offers a platform that facilitates the safe exchange of reliable data across financial organizations.

The platform provided by Finvu AA enables information sharing between your financial institution and the users of financial information who are offering you financial services.

Information sharing in real time with your consent.

Both in transit and at rest, data is encrypted, ensuring the security of information sharing.

They do not collect or keep any login information for your accounts with financial institutions.

On the Finvu app, manage your consents and other settings. To give their clients a better experience, institutions can design future-ready digital solutions with Finvu's assistance.

11.5.1 Working:

Individuals, business owners, and others who want to share their information to obtain a financial service or product are examples of end users of the ecosystem. You will be able to register and link your accounts for consented data sharing from the Finvu App in three simple steps. One just needs to register on a Finvu application, link their accounts, and provide consent.

For financial information users, they can request customers for consent to get financial data for providing financial services or products.

11.5.2 Pricing:

Our standard pricing is between IN 20 to IN 30 per data fetch. However, they also offer preferred and standard pricing based on volumes.

11.6 Yodlee Finsoft

11.6.1 USP of Yodlee account Aggregation:

1. **Current Information:** Using automated data, you can be sure you always have access to the most recent information.
2. **Bank-Level Compliance and Security:** The company's account aggregation service adheres to industry best practices for security, risk, compliance, and consumer privacy.
3. **Exceptional Data Sources:** By merging more than 17,000 global data sources, we offer access to de-identified data analytics and insights.

4. Adding to the data for the most accurate and practical insights to gain a competitive edge, make use of our Transaction Data Enrichment tools.

11.6.2 Benefits of Data Enrichment while using YODLEE ACCOUNT AGGREGATION -

1. **Clear and Accurate Data:** Since our data uniquely identifies over 3MM distinct outlets in the U.S., U.K., and Canada, you could derive beneficial knowledge from it.
2. **Engaging and Easy to Use:** The company's machine learning algorithms and the contextualization of financial data will be straightforward to comprehend for both the banking organization and its users.
3. **Mitigate Risk:** Transaction data enrichment eliminates risk through guaranteeing the companies are using the most valuable data obtainable to make informed choices.
4. **Contextualized Data:** Contextualized data is used to provide tailored financial counsel and enhance the level of accuracy of chatbots controlled by speaking assistants.
5. **Easy Integration:** Establishing and maintaining your project are both rendered simple by our straightforward API aggregating platform.

11.7 NeSL

An Information Utility (IU) registered with the Insolvency and Bankruptcy Board of India is NeSL (National e-Governance Services Ltd) (IBBI). It offers a platform for securely storing and keeping financial information on businesses, people, and other entities. NeSL stands out from other IU platforms because of several distinctive features.

NeSL's unique selling point is its capacity to keep a centralized database of financial data from many industries, including banking, insurance, and securities. For all parties involved in the financial ecosystem—lenders, borrowers, regulators, and investors—it serves as a one-stop shop. NeSL's platform gives users a thorough understanding of an entity's financial history and performance, which facilitates better decision-making and risk assessment.

11.7.1 Unique Selling Proposition (USP):

NeSL's ability to maintain a consolidated library of financial data from many industries, including banking, insurance, and securities, is its unique selling proposition (USP). For all parties involved in the financial ecosystem—lenders, borrowers, regulators, and investors—it serves as a one-stop shop. NeSL's platform gives users a thorough understanding of an entity's financial history and performance, which facilitates better decision-making and risk assessment.

11.7.2 Target Segment:

NeSL serves a broad range of financial ecosystem participants, including banks, financial institutions, asset reconstruction firms, credit rating agencies, regulatory organizations, and private persons. These stakeholders may securely and effectively access and share financial information thanks to its platform.

11.7.3 Social Media Promotion and Profiles Analysis:

NeSL is active on social media sites including LinkedIn, Twitter, and Facebook. It uses these platforms to disseminate updates about its goods and services as well as news and perceptions about the sector. NeSL also advertises its events, webinars, and training courses on social media.

11.7.4 Software Costs:

The price of NeSL's software and services are not made public. Nonetheless, it provides clients with tailored solutions based on their unique demands and expectations.

11.7.5 Safety and Security Measures:

To guarantee the integrity and confidentiality of the data kept on its platform, NeSL has put in place a number of safety and security measures. They consist of:
Data Encryption: NeSL protects data both in transit and at rest using cutting-edge encryption methods.

Before allowing access to the platform, NeSL needs users to authenticate themselves using numerous factors, such as passwords, OTPs, and biometric authentication.
Access Control: To ensure that only authorized users can access the data kept on its platform, NeSL adheres to strong access control rules.
Data recovery and backup: NeSL periodically backs up data to make sure that it can be swiftly restored in the event of corruption or loss.
Compliance with Regulations: NeSL complies with several industry norms and laws, including ISO 27001:2013.

11.7.6 IT Setup and Storage of Data:

NeSL's IT infrastructure is built with high availability, scalability, and client data security and privacy in mind. Its IT infrastructure and data storage main components are:
Platform built on the cloud: NeSL's platform is based on a cloud-based architecture, which guarantees data security while allowing for scalability and availability.
Data Encryption: NeSL protects data both in transit and at rest using cutting-edge encryption methods.

NeSL maintains data on safe servers that are based in India. It adheres to tight guidelines for data preservation and provides redundancy and backup in the event of data loss.

11.8 PhonePay

PhonePe has been granted In-Principal Permission from the Central Bank of India (RBI) to continue functioning as an account aggregator (AA), according to a release to the press from the company. The organization claimed that this will make it possible for Walmart-owned PhonePe to launch its own AA platform. Further information regarding how PhonePe wants to make use of this approval to further develop its platform will eventually be made accessible to everyone, stated a company representative. Within the approval's 12-month validity period, PhonePe must "install the technology platform, enter into all the other legal agreements necessary to be ready for operations, and report position of compliance with the requirements of grant of in-principal approval to the Bank. “Once the central bank feels satisfied with its compliance, a Certificate of Registration confirming its function as an NBFC-account aggregator will be granted; nevertheless, it will not be allowed to officially start operations until then. As it launches, twelve organizations and institutions are reportedly implementing the FIU and FIP framework at various levels, including those belonging to the State Bank of India, HDFC Bank, ICICI Bank, and LendingKart, among others. The account aggregator system enables financial institutions to share information about customers across different banking services after acquiring authorization.

12. Company Case Study

12.1 Dashboard Account Aggregation

In this analysis, we will explore two main works of an AA: content management and displaying the net worth of citizens.

12.1.1 Strategic Focus and Customer Retention:

To remain competitive, DASHBOARD may have to focus on tier 2, 3, and 4 cities, targeting individuals with existing credit history who require credit and financial literacy support. Also, DASHBOARD aims to provide secure and accessible credit options to these individuals, leveraging its partnerships with over 30 banks, including HDFC, ICICI, SBI LIFE, FEDERAL BANK, YES BANK, AU SMALL FINANCE, FINCARE, and ABV.

To retain customers, the company can leverage its integration with the financial institutions, making it mandatory for customers to use the DASHBOARD platform. Additionally, it can enhance user experience by offering a multilingual app available in seven languages, making it easier for users to navigate and utilize the platform.

12.1.2 Pricing Model:

The pricing model for the DASHBOARD account aggregator services is approved by the board. It is mentioned that the market determines the pricing, suggesting a commoditized market where pricing is decided based on market forces. The CEO had also mentioned staggered pricing for different types of institutions such as PSU, large and small sector banks, and mutual funds.

Additionally, it is stated that there are no charges imposed on customers for using the account aggregator services.

12.1.3 Differentiating Factors and Competitors:

In the market, all account aggregators offer similar services, making differentiation a challenge. However, certain factors can set a DASHBOARD apart from its competitors. One such factor is the efficiency in data sharing. While traditional methods like password sharing and file uploads are typically 70-80% efficient, an AA aims to provide 100% data accuracy to the financial institutions. This ensures that banks receive complete and accurate information, enabling better decision-making.

Another differentiating factor is the DASHBOARD's ability to support an end-to-end journey for users, particularly in tier 2, 3, and 4 cities. By offering a user-friendly interface and providing data access from previous years, an AA can cater to the needs of individuals who may require secure credit and financial literacy support. Additionally, DASHBOARD can facilitate balance sheet-based lending, further expanding the scope of its services.

12.1.4 Regulatory Compliance and IT Structure:

Compliance with regulatory requirements is crucial for a DASHBOARD's success. In terms of IT infrastructure, the company must ensure secure cloud management, including data encryption for data in motion and data at rest. This ensures the protection of user information. Non-IT aspects, such as having sound directors who meet fit and proper criteria, an effective grievance redressal mechanism, and regular quarterly filings, are also necessary for compliance.

12.1.5 Content Management:

One of the primary functions of DASHBOARD as an AA is to manage content related to users' financial data. This involves establishing a reliable and stable system that efficiently connects with various FIUs. They must ensure a seamless flow of data through a redirection process, enabling users to view their balances and transactions across different financial accounts. This process requires adherence to guidelines set by the Reserve Bank of India (RBI) and the National Financial Reporting Authority (NFRA) to ensure compliance and data security.

To offer these content management services, DASHBOARD operates within a commoditized market, where pricing is largely determined by market forces. Pricing models are typically approved by the board and may vary based on the type of institution, such as public sector banks, small sector banks, and mutual funds. It is worth noting that charges are not levied directly from the customer but are instead covered by the participating financial institutions.

12.1.6 Displaying Net Worth:

The second main work of a DASHBOARD account aggregation service is to display the net worth of citizens. By aggregating data from various financial accounts, DASHBOARD provides users with a comprehensive overview of their net worth. This allows individuals to assess their financial standing and make informed decisions. The goal of DASHBOARD is to act as a bridge between the user and the financial institutions, facilitating real-time access to the necessary data for net worth calculation.

12.2 Cams Finserv

Cams finserv currently caters to Individuals and sole proprietorship firms and has the highest market share of tie ups with 31 banks out of which SBI is their largest information user this makes it easy for individuals to have trust and faith in them, and in future wants to tie up with corporates so that they can collect more information. Amongst all its competitors CAM finserv is the first company who introduced GSTN.

12.2.1 Strategic Focus and Customer Retention:

Individuals will not pay a single penny; this is because they want as many users as possible on board so that they have access to huge amounts of data. Additionally, if they charge from users then there will be no difference between a traditional financial service provider. This free service is also provided by Jupiter and Grow money.

This will increase traffic on their website, and which will be eventually helpful to the company in making future decisions. The company tracks the actions of individuals based on their different clicks on the screen and later at the time of analysis it would help them frame the policies. From this data analysis they come to know about customer's interest and for how long they tend to use the app and for which specific activity they use the AA service like for mutual funds, insurance etc.

12.2.2 Pricing Model:

The company right now is at pre revenue stage and mainly chargers from Banks, NBFS, Wealth managers, insurance companies, stockbrokers, fintech's, small banks etc. where in turn they provide data and charge from FIPs as they provide the data to them. Even though it is at a pre revenue stage their tie up with other banks is very high which makes them reliable amongst their competitors.

They are focusing mainly on insurance companies and mutual funds because they have their own subsidiary in this field. Moreover, the main advantage through these ties ups is the information about the customer's credit worthiness they get as they sign the underwriting. Due to which they get easy access to the worth of the customer and will know which customers to target.

12.2.3 Differentiating Factors and Competitors:

Cams finserv gives utmost importance to the security of data and customer consent which is one of the main USP of the company as is already an international company and have many subsidiaries, so they manage and use millions of data, hence their database is huge, and this is the one of the leading companies of AA and they manage everything efficiently. All of their data is encrypted and only a particular department's employee has access to specific data.
They have data access management policy, ISMS policy, DLP policy which keeps a check on the security of the data.

12.2.4 Regulatory Compliance and IT Structure:

The company follows all the regulations set by RBI, to ensure the safety and security of the data they have ensured segregation of duties, limited access of data and various norms regarding the safety and security of the data.

13. Key Outcomes for the Companies based on Case Study:

1. Both Cams Finserv and Safe are pre revenue, both are looking forward to being profitable in the current year but as per our analysis Cams would be able to leverage itself in the market as it has highest number of tie ups with FIU and FIPS, with gives them a competitive edge over other players in the market.

   Both companies Dashboard and Cams Finserv have tied up with several banks. Even though both companies are at pre revenue stage dashboard has tied up with 30 banks and Cam Finserv has tied up with 31 banks making them both very reliable among other competitors.

2. The revenue model of both the companies is same and both the companies do not charge from customers, it is the quality of service they provide retains the customer, in this case both the companies are focusing on different target audience cams and is looking for the big players whereas Saafe does not have particular preference in the same.
3. Cams also have leverage over the IT infrastructure as it is already a big player in other fields of business-like insurance, mutual funds, etc. It has experience of handling and managing such huge data, which is a major differentiating factor in terms of making profit faster than its competitors.
4. In terms of infrastructure built for data security Cam Finserv has a better infrastructure for secure and efficient transfer as its parent company is already operating on an international level and Cam Finserv is part of a network with its various other subsidiaries. So, they deal with a large database of customers of other subsidiaries.

5. Saafe has to borrow funds from outside in which they may or may not be successful whereas cams can take debt from their parent or subsidiary company, so availability of cash is at a cheaper rate.
6. Both companies Dashboard and Cam Finserv prioritize data security and offer end to end encryption services to customers to ensure their privacy. Cams already have advanced security data setup like sandbox, firewall, etc. Saafe is still developing and advancing slowly, due to which even if they have more customers, they won't be able to handle such large data without having proper infrastructure.
7. The security of both the companies is the same, both forward encrypted data.
8. Both companies follow rules and regulations given by the RBI.

13.1 Recommendations

1. As per the current data available Cams is focusing on big players like corporates, dashboard can grab as many small players as possible.
2. Cams have experience and better IT and security structure which gives it competitive advantage than others. Dashboard have come up with biometric technology but still it can aim to provide better safety and security measures which gives it a competitive age than other players.
3. Cams provides its service in 7 different languages to reach out larger audience, same can be done by Dashboard, as in India many customers prefer their mother tongue language, which helps them to connect to larger audience easily.
4. Cmas is in the market for longer time than Dashboard as it provides various other services, so Dashboard needs to gain trust among the customers.
5. Cams have already tied up with large amount of FIP and FIU in comparison to Dashboard, so they are in lead and can have easy access to large data, dashboard should tie up with more such institutions.
6. Cost of raising new capital will be lower for Cams than dashboard as it can directly lend from the subsidiaries.

7. These two companies are the two huge players in the market so they should target different audience and excel by providing their services while also giving healthy competition to each other and coexisting at the same time.

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14 Conclusion

In conclusion, the concept of account aggregators has emerged as a powerful tool in the realm of financial data management and integration. We have investigated the various aspects and implications of account aggregators throughout this capstone project, shedding light on their significance and potential impact.

We as a group have looked upon Open Banking in India that because of security reasons and RBI permissions it becomes difficult to manage everything. Similarly for account aggregators, they need to take permission from NBFC, have to look at data security, as well as IT infrastructure. So, we studied how data security takes place, how data processing takes place, and also studied in detail about FIP and FIU. Customer consent acts as one of their USPs. We understood the revenue model of FIP, FIU, Dashboard, Camfinserv. In mutual funds and insurance, there is underwriting which helps in collecting the data. Similarly, account aggregators also follow the same method and don't charge customers for the same. account aggregators collect the data, understand them, and analyze them further, and then provide services to its customers. We also went through RBI regulations and understood which regulations fall under account aggregators.

After analyzing the case study, we concluded that UPI and BHIM exist which makes it very convenient for customers as now they are looking for more convenience. We also got to know how AA and traditional banks competitors and they are co-existing in the ecosystem, but we can conclude that a lot of people prefer doing everything online sitting at their homes finishing their work with one tap on their own mobile phones. Lot of services are provided by the company which are wealth management, mutual fund, and customers get all of these at one place. Lastly, open banking also has a future as data works on cloud computing encryption because of security reasons. There are majorly only the nine companies which are leading and are considered for our capstone project. The first company is Cams Finserv followed by Dashboard. Cams Finserv, in specific, is trying to go international but since they are pre-revenue and on a nascent stage, they won’t be able to make it international soon enough. But if AA becomes successful just like UPI,

then it will hit international markets soon enough. Since there is less awareness regarding AA, companies are trying really hard to create cognizance for the same. Since there is a lot of scope in AA, all other transaction instruments will co-exist with AA. Lately, it looks like that all the focus from traditional banking will be lessened and it will be used more for loan-lending purposes.

Ultimately, account aggregators have the potential to transform the way individuals and businesses manage their financial data. As they gain traction in the financial industry, it is critical to address the challenges associated with them and collaborate to establish standards, guidelines, and best practices. Account aggregators can empower users, foster financial inclusivity, and drive positive change in the financial ecosystem with careful implementation and oversight.

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16. Appendix

Interview questions

1. Company related questions.

- Can you tell us about your company's overall business strategy and how it differentiates you from competitors in the account aggregation space?
- How has your company's performance (based on profit: year on year growth) been in the past year, and what do you attribute to your success or challenges?
- What are your drivers of success?
- Can you discuss your pricing model and how it has evolved over time to remain competitive?
- What is your major source of revenue: is it from customers or financial service providers?
- What types of partnerships have you established in the industry and who are your major investors, and how have they impacted your business?
- Can you provide any specific examples of how your services have helped customers achieve their financial goals or improve their overall financial health?

2. Customer related questions

- How do you identify and target potential customers, and what factors do you consider when determining their suitability for your services?
- Can you share information on your customer acquisition strategy and the channels you use to reach new customers?
- What type of clients do you typically serve, and how do you tailor your services to meet their specific needs? Do you have a specific criterion based on demographics like income or age?
- What is your approach to customer retention, and how do you ensure that your customers remain engaged with your platform over time and how do you maintain their loyalty?

- What is your customer retention cost and in average how many days does a customer come back to you to avail the service?
- How has your company's performance (how many customers users have increased) been in the past year, and what do you attribute to your success or challenges?

3. Safety and security related questions

- How do you manage your regulatory compliance costs, and what steps do you take to ensure that you are in compliance with applicable laws and regulations as per RBI guidelines?
- How do you approach security and data privacy, and what measures have you taken to protect your customers' sensitive information?
- What type of IT infrastructure facility are you using for ensuring data safety and privacy?
- How do you ensure that the data remains secure with the employees
- Can you provide information on your technology and infrastructure costs, and how you have invested in these areas to support your growth? Explain the bilateral flow of data from FIUs to FIPs.

4. Future scope related questions

- Can you talk about any recent product developments or enhancements you've made to improve the user experience or meet changing customer demands?
  How do you see the account aggregation market evolving in the coming years, and what is your company going to stay ahead of these changes?
- What steps your company is taking or the future plan to sustain in the market for lifelog?
- Have you opted for any merger or acquisition or planning in future? Are you planning to enter into the international market like your competitors?