Superapps: Breaking down barriers, building bridges

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GLOBAL FINTECH FEST

Foreword

We are delighted to present our white paper titled 'Superapps: Breaking down barriers, building bridges'.

The last decade has seen every need – financial or otherwise – of customers being increasingly met in a few clicks. This growth in e-commerce has led to rising customer expectations for a single seamless interface. The highly competitive industry sought to address this ask by integrating all the needs of a customer on a single platform. This led to the emergence of the concept of a 'superapp'.

While superapps have been developed across sectors, the success of these apps in the financial services domain merits special attention. As regards growth across the globe, Asian countries have seen far more successful implementation of superapps in comparison to the West. Integration of payments and embedded credit have driven greater growth and adoption of these platforms in Asia.

Interestingly, despite their rapid growth, a single regulatory framework specific to superapps has not yet been put in place by any country. Thus, the potential considerations while operating a superapp have been completely at the discretion of the relevant players, leading to diverse practices.

Against the above backdrop, this paper delves into typical models of superapps, critical drivers of their growth and key considerations while operating superapps. The paper also attempts to touch upon the basic guardrails or framework that one can consider while operating a superapp.

We would like to extend our gratitude to the Payments Council of India, FinTech Convergence Council and National Payments Corporation of India (NPCI) for organising the Global FinTech Festival (GFF) 2024 and inviting PwC India to be a knowledge partner.

We hope you will find this paper to be an insightful read.

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Partner and Leader – Deals
PwC India

Executive summary

The invention of smartphones has truly revolutionised the way humans conduct business and interact with each other. In many areas of the world, a smartphone is the primary internet access device for billions of people. Consequently, businesses have established their digital platforms to harness this massive potential. Over the years, as more and more services have transformed into 'app-based platforms', a robust market of multiple apps has developed. Once seen as a transformational catalyst in enhancing customer convenience and experience, the emergence of so many apps for every service eventually led to a fragmented user experience for the customer.

Therefore, a concept of 'superapps' emerged, primarily in Asia. These are all-in-one platforms which offer various services, either through in-house service providers or third-party integration within the same sector, or across multiple sectors and segments. allowed cross-selling of services by multiple service providers on the same platform under a common brand umbrella. This is monetarily beneficial for service providers and simultaneously provides the superapps with a revenue model based on fees, commissions, subscriptions, etc. Moreover, it enhances customer experience through a unified platform interface.

However, the inflection point for superapps came when digital payment services were integrated into the platform. This allowed for seamless transaction experience on the superapps. Additionally, since digital payments adoption in Asian countries is relatively higher, this integration reduced the customer acquisition cost for superapps as payments provided a gateway for its users to enter into the superapps ecosystem.

This was followed by an integration of embedded credit into these platforms. Typically, credit is a function of traditional financial institutions. However, having witnessed the massive customer base of superapps and opportunity provided by integration of payments into these platforms, lending/credit services like buy now, pay later (BNPL) began integrating into superapps. This allowed for seamless credit facilitation to new-to-credit (NTC) or underserved customers. Additionally, it fulfilled the short-term credit requirements for the salaried class or business for cash flow requirements.

Notably, although the Indian superapp ecosystem is still nascent, it is a flourishing space driven by financial platforms which are superapp contenders. Moreover, large conglomerates have recently entered this space with the aim to consolidate their businesses across various segments. Thus, superapps are evolving at a fast pace. As superapps aim to enhance customer experience and convenience by integrating various services into a single interface, certain aspects are being increasingly discussed, especially regarding regulation of superapps with respect to their governance structures, compliance with data governance laws, customer service, cybersecurity governance, etc.

Presently, there is an absence of dedicated regulatory framework to govern superapps globally, barring a few jurisdictions where the initial attempts are being made to address the concerns regarding superapp platforms through regulatory initiatives. In such a scenario, India may proactively implement measures to address key concern areas in the superapp ecosystem through industry initiative, regulatory oversight, etc., as may be appropriate.

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Introduction to superapps

In the last few years, the smartphone revolution coupled with deepening internet penetration has transformed the way humans interact with businesses and each other. The ability to book tickets, order food, shop, make bill payments, etc., with the press of a button on a smartphone has transformed business models and consumer behaviour. Smartphones have enabled a seamless and personalised customer experience through dedicated applications for various activities. These applications allowed for easier data gathering on customer preferences, enabling businesses to create niche products tailored for their customers.

As smartphone adoption grew exponentially, the customers' needs to shop, invest, book tickets, etc., through smartphones increased, and thus, came the era of having apps catering to various needs of a customer across various sectors. The initial boom in the adoption of app-based services led to growing brand usage and loyalty. However, soon, these apps faced severe headwinds due to strong competition, which meant that further growth of the core services may not have been possible. Moreover, these internet-based services grow through network effects. Thus, gaining a large customer and merchant base is important for them for growth and expansion. These factors, coupled with the high cost of consumer acquisition, marketing, transaction costs, etc., meant that many such standalone apps for each service may not become financially viable.

From a customer's standpoint, it led to a fragmented user experience due to the need to switch between multiple apps with their distinct user interface and experience for accessing different services, creation of separate accounts resulting in additional logins, multiple transactions across various apps, etc.

Consequently, these apps began consolidating through vertical or horizontal integration of services into superapps (also known as 'Ultralarge platforms' or 'Gatekeepers' in some geographies). This also enhanced customer experience as now, customers could access multiple services through a single app and interface. Moreover, it benefitted the services providers as it streamlined their costs and increased sales due to the ability to cross-sell their various services to the customer, which was not possible earlier due to multiple apps.

With the above background, it is important to first understand what a superapp means. As such, one is unlikely to come across a regulatory definition of 'superapp' as the concept is yet evolving.

However, according to Harvard Business Review,

> "A superapp is a single application, accessible by mobile device or web browser, that offers multiple diversified services for everyday personal or commercial life, relies on a common financial transaction platform, leverages intra-app data to tailor offerings, and is widely adopted.[1]"

Meanwhile, Gartner defines superapps as follows:

> "A superapp is an app that provides end-users (customers, partners or employees) with a set of core features plus access to independently created mini-apps. The superapp is built as a platform to deliver a mini-apps ecosystem that users can choose from to activate for consistent and personalized app experiences. There is no separate app store or marketplace for mini-apps. They are discovered and activated by the superapp users, and once used, they can also be easily removed from the UI.[2]"

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[1] Harvard Business Review; Are super-Apps Coming to the U.S. Market? Dan Prud'homme, Guoli Chen, and Tony W. Tong; April 27, 2023; https://hbr.org/2023/04/are-super-apps-coming-to-the-u-s-market

[2] Gartner; Information and Technology Glossary – Superapps; https://www.gartner.com/en/information-technology/glossary/superapps

Key technology components of a superapp platform

A typical superapp platform will have the following key components in its technology architecture:

1. **Microservices architecture:** Superapps are built upon a microservices architecture, where each service is developed as an independent and loosely coupled component. This modular approach allows for easier maintenance, scalability and flexibility in adding or updating functionalities without impacting the entire system.

2. **Application programming interface (API) gateway:** An API gateway is a central entry point for all incoming requests to the superapp. It handles authentication, routing, load balancing, and API versioning, ensuring secure and efficient communication between clients and microservices.

3. **Service registry and discovery:** Service registry and discovery mechanisms enable dynamic service discovery and registration within the superapp ecosystem. This ensures that microservices can locate and communicate with each other seamlessly, even as the system scales and evolves over time.

4. **Data management layer:** The data management layer is responsible for storing and managing the vast amounts of data generated by the superapp. It includes databases, caching systems, and data processing pipelines optimised for high performance, reliability, and data consistency.

5. **Authentication and authorisation:** Security is paramount in superapp architecture. Robust authentication and authorisation mechanisms are essential to protect sensitive user data and ensure secure access to services. This typically involves implementing standards-based protocols such as OAuth 2.0 and JSON web tokens (JWT).

6. **User interface layer:** The user interface layer encompasses the front-end components of the superapp, including the mobile app interface and web interfaces. It focuses on delivering a seamless and intuitive user experience across different devices and platforms, leveraging technologies such as React Native, Flutter, or native mobile development frameworks.
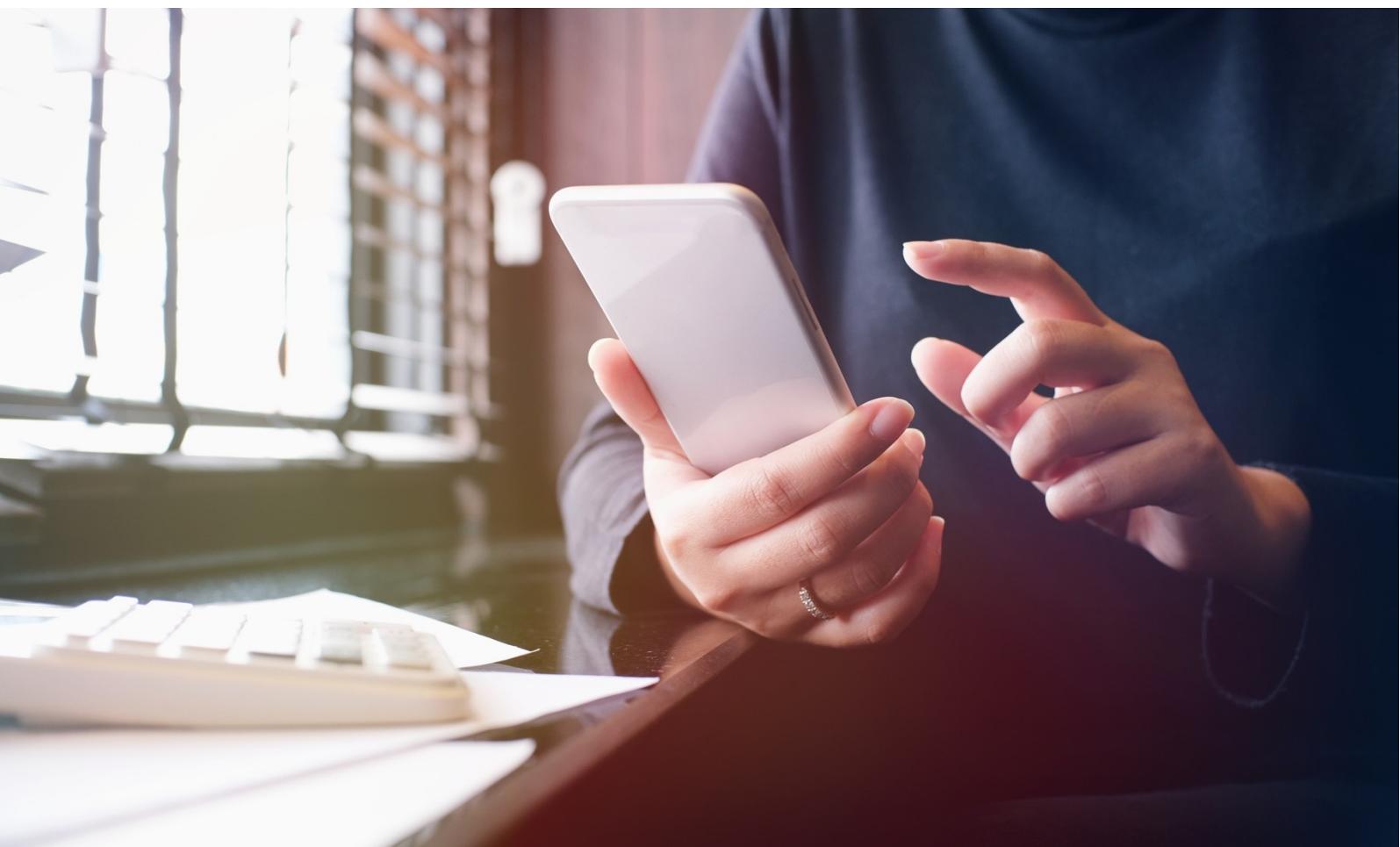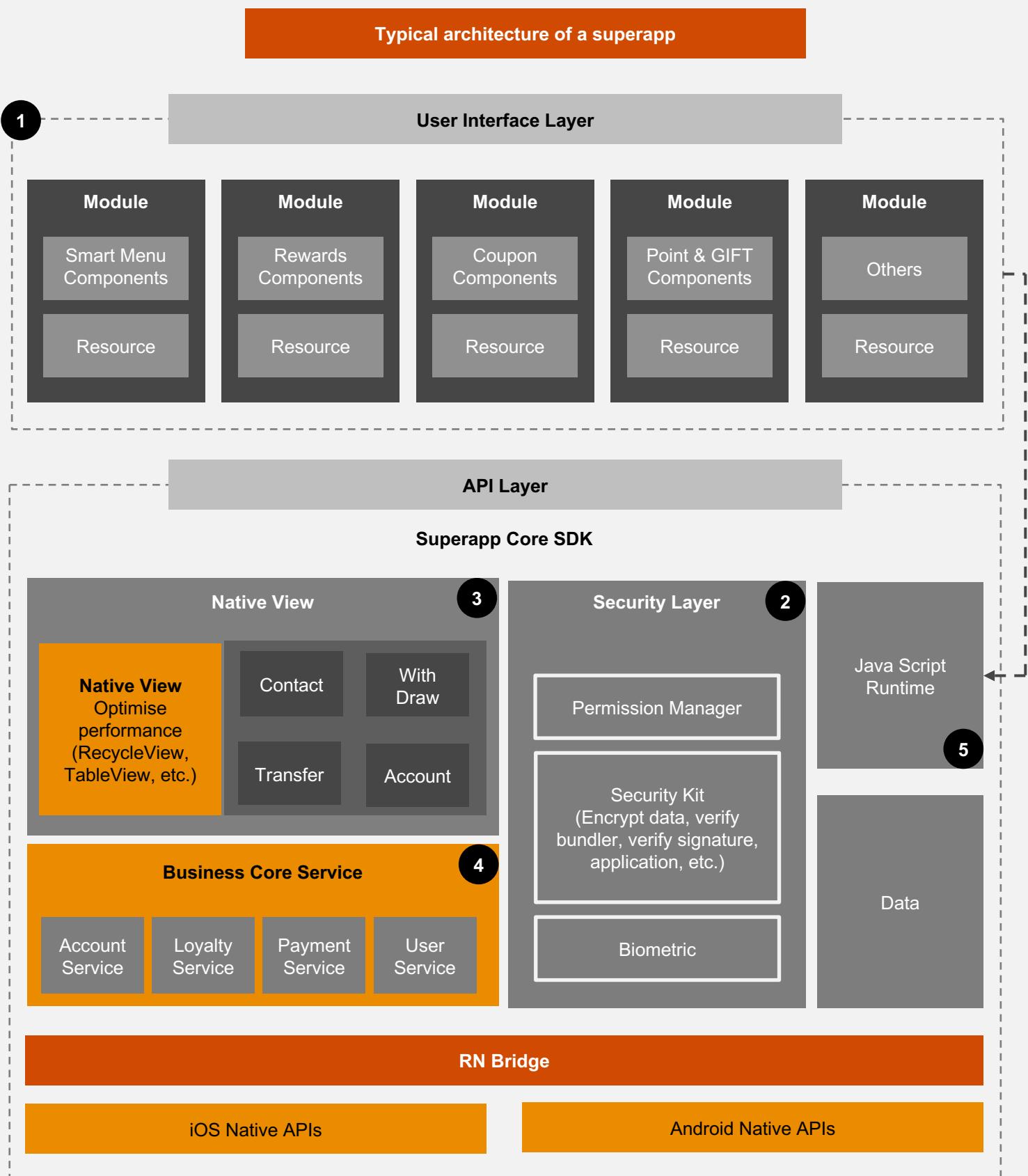
Figure 1: Typical architecture of a superapp

Typical architecture of a superapp

(1)

User Interface Layer

Module	Module	Module	Module	Module
Smart Menu Components	Rewards Components	Coupon Components	Point & GIFT Components	Others
Resource	Resource	Resource	Resource	Resource

API Layer

Superapp Core SDK

Native View (3)

Native View Optimise performance (RecycleView, TableView, etc.)

Contact	With Draw
Transfer	Account

Business Core Service (4)

Account Service	Loyalty Service	Payment Service	User Service

Security Layer (2)

Permission Manager

Security Kit (Encrypt data, verify bundler, verify signature, application, etc.)

Biometric

Java Script Runtime (5)

Data

RN Bridge

| iOS Native APIs	Android Native APIs

Source: Industry insights

Typical business model of superapps
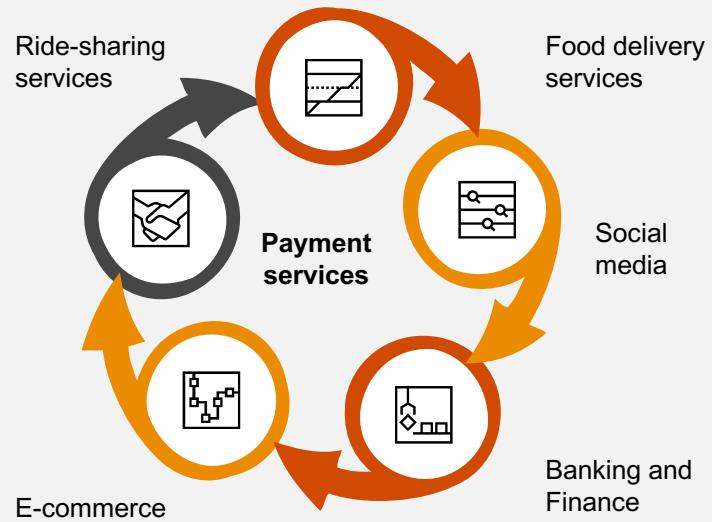
A typical superapp business model will be a horizontal or vertical integration of in-house or third-party services, which may or may not be regulated, across a single platform which provides a unified customer interface.

A vertical integration occurs when service providers within a specific industry or market are integrated. Typical examples of a vertically integrated superapps can be found in India. Many such platforms providing a range of financial services, from banking to payments to investments, have emerged in the past few years.

Meanwhile, horizontal integration occurs when a broad range of services across multiple industries are integrated. Typical examples of horizontally integrated superapps include various e-commerce platforms which have diversified into hospitality services, FMCG segment, payments and lending activities, etc.

Figure 2: Typical business model of a superapp ecosystem

Ride-sharing services

Food delivery services

Payment services

Social media

E-commerce

Banking and Finance

Source: PwC analysis and industry insights

Revenue streams for superapps

One of the foremost incentives of a superapp model for the service providers (financial services, e-commerce merchants, food delivery services, ride hailing aggregators, etc.) is the streamlining of expenses and increase in revenue. By creating a unified customer interface, seamless platform integration and a singular brand identity for all service providers, certain costs attributed to the service providers (marketing, customer acquisition, technology infrastructure, etc.) are minimised. Additionally, service providers can to generate additional revenue through cross-selling, which would not be possible without a unified platform.

But then how do superapps make money?

Superapps generate revenue through various channels from service providers onboarded on the platform, customers, third party partnerships and integrations, data monetisation, etc.
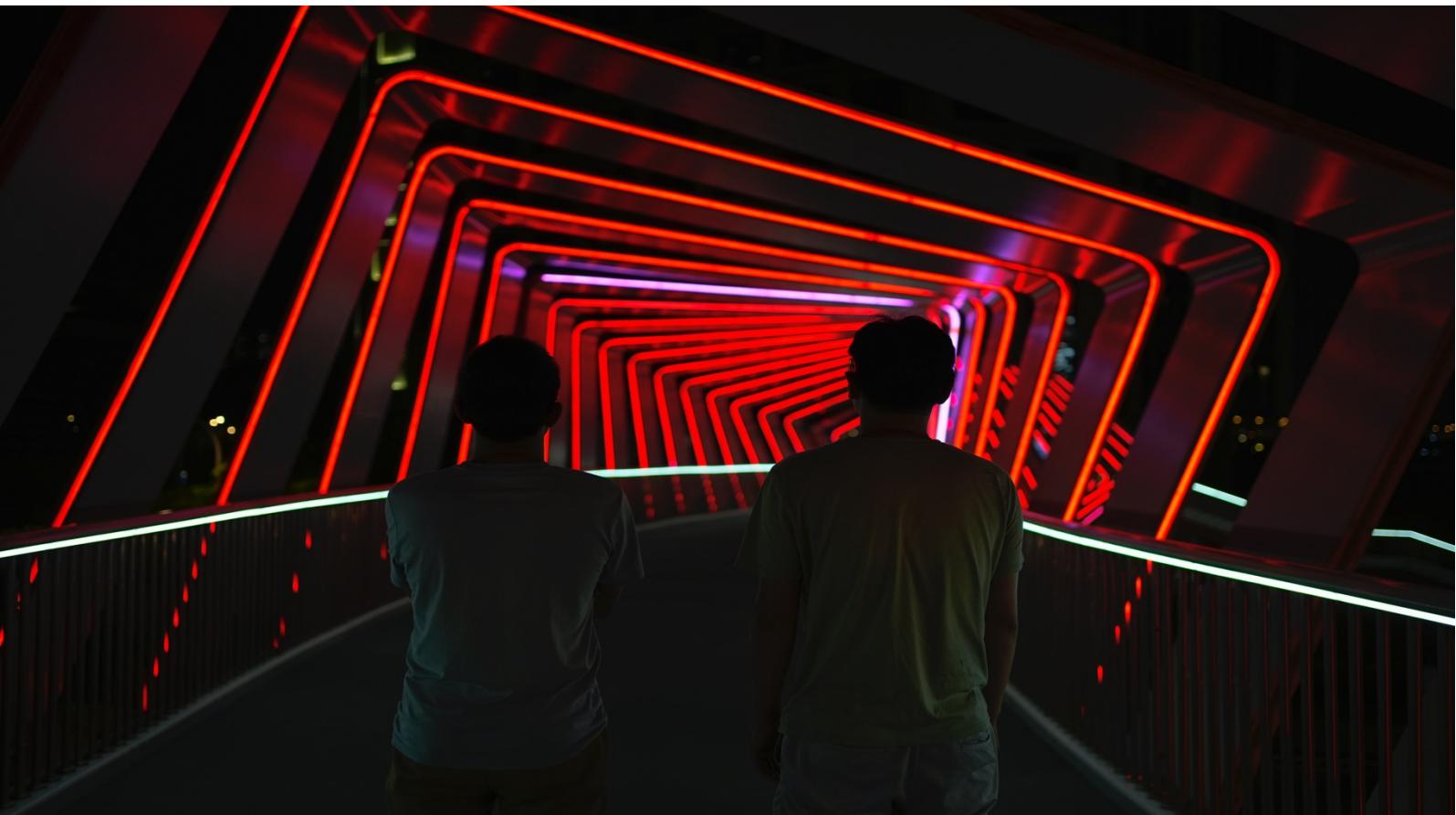
Figure 3 depicts the primary revenue streams for a superapp.

Figure 3: Indicative revenue streams for a superapp

Source: PwC analysis; desktop research
Infosys; TAKING ADVANTAGE OF THE SUPERAPP OPPORTUNITY; 2023; https://www.infosys.com/industries/financial-services/documents/taking-advantage-super-app.pdf

Agile Tech Vietnam; Super App Strategy: How To Make A Profit From Super Apps; https://agiletech.vn/super-app-strategy-forbusiness/#:~:text=Super%20apps%20help%20earn%20fees,can%20comeback%20for%20its%20convenience.

Emergence of superapps in Asia and across the globe

Interestingly, the concept of superapps emerged primarily from Asia, where indigenous tech giants transformed their business models into these superapps. Countries like China, Indonesia, and South Korea have been the nursery of successful superapps of the world.

Various superapps that exist today were initially launched as single purpose applications for providing various services like web-based messaging, ridesharing, food delivery or even as instant digital payments platform. Given that most of these platforms had a first movers advantage in their respective sectors and countries, this allowed these platforms to build a large customer base which grew quickly. Over time, superapps integrated businesses or services built around a primary business or service either through in-house applications or acquisition of existing platforms. Thus, as the primary business or service achieved sufficient network effects, the next ideal step in the superapp journey was to venture into ancillary ecosystems. This was followed by the integration of payment services and embedded credit services into these platforms. This allowed superapps to truly harness the potential of a unified interface by leveraging on cross-selling on the platform.

Superapp ecosystem in India

India has been a late entrant to the superapp landscape. However, even within such a short period, numerous platforms in India are vying for the superapp status. A crucial factor driving this growth is the e-commerce market opportunity in India, which is estimated to surpass USD 1.6 trillion by 2025[3].

A. An ecosystem driven by financial services platforms

India's superapp ecosystem has a unique feature that it is primarily being driven by financial platforms. Traditionally, India has been a cash dependent country with low financial inclusion and a vast credit gap. This changed with the introduction of the Jan Dhan Yojana, which enabled the creation of millions of basic savings bank accounts for the underbanked customers and introduction of the Unified Payments Interface (UPI), India's indigenous instant digital payments system. Consequently, India has become a leading economy when it comes to digital payment transactions.

Recognising the potential in cross-selling financial services to customers using digital payments, many players have entered the superapp ecosystem with their business models centred around financial services. This has enabled the entry of millions of customers into the financial ecosystem. Today, a majority of superapp contenders in India are vertically integrated financial platforms which offer services ranging from payments, credit, investment to insurance. Increasingly, large industrial houses are also vying to make a mark in the superapp space, integrating varied financial services (through own issuance, manufacturing or third-party tie-ups/distribution) in a single customer interface. In fact, some industrial houses have traditionally and predominantly operated in non-financial services space but are now seemingly shifting to financial services as a primary offering through a superapp in the making.

B. Other business models

In addition to the aforementioned financial superapp model, vertically integrated platforms focused completely on a specific industry like healthcare or fast moving consumer goods (FMCG) are emerging.

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[3] https://Inc42; Inside India's $1.6 Tn Consumer Internet Economy; Vaishnavi Dayalani; 27th May 2022; https://inc42.com/features/inside-indias-1-6-tn-consumer-internet-economy/

Factors contributing to the growth of Superapps

A. Smartphones as the primary device to access the Internet in Asia

A primary factor which has contributed to the emergence and growth of superapps in Asia has been the exponential adoption of smartphones. A mobile or smartphone is the primary device for an Asian to access the internet. Over 90% of the people connected to the Internet access it through their mobile device on a daily basis. Thus, many platforms built their ecosystem organically through mobile applications to cater to the fast-growing smartphone population.

B. Integration of payments

Integration of payments with a superapp platform has been the backbone in emergence of superapps. A payment service is usually at the core of this ecosystem and acts as an adhesive which holds together the other products or services offered on the superapp.

For the customers, the integration of a payment service facilitates seamless transactions on the platform and reduces friction as the customer is no longer required to switch into other apps for completing the transactions. Additionally, the customers gain immensely from platform level loyalty programmes and cashbacks or rewards on transactions through the superapp. Consequently, the overall customer experience is also enhanced with a seamless transaction experience.

This integration of payments has worked especially well in Asia as digital payments have become the primary means of payments other than cash.

C. Embedded credit

Integration of payment services has acted as the gateway for superapp users to access institutional credit. Consequently, as the integration of payment services on superapps became successful, it paved the way for digital lending services to enter into the superapp ecosystem. This was particularly beneficial for new-to-credit (NTC) customers and the underbanked section of the population, for whom accessing credit through traditional channels has always remained a herculean task.

Notably, in Asian countries like India, a significant credit gap remains due to low financial inclusion. Additionally, accessing institutional credit through traditional channels has always remained a herculean task for NTC customers and the underbanked section of the population until recently due to complex know your customer (KYC) processes, lack of proper documentation which makes underwriting difficult for banks, etc.

The integration of digital lending services like buy now pay later (BNPL) have immensely benefitted the salaried customers and low-income segment customers as they are now able to purchase goods and services through easy credit provided on the platform itself.
Many superapp contenders have now recognised the need for integrating embedded credit into their platforms. Indeed, this has fuelled a growing adoption of superapp platforms.

Superapp development in the West

Unlike Asia, the West has not yet warmed up to the idea of a superapp. While there is an ongoing effort to create superapp-like platforms in the West, they are distinctly different from the organic growth observed in Asia. Most western initiatives are based on acquisition of existing brands and a third-party platform structure where different entities attempt to integrate their operations, business models and customer base. Presently, no platform in the West exists which can be called a true 'superapp'.

Why has the West not been able to adopt the superapp model successfully?

Internet usage in the early days of the web was primarily driven by high adoption in the West. Thus, the western countries came online way before the Internet reached the common person in Asian countries. Consequently, technology companies primarily designed web-based application suitable for access through computers or laptops. While these companies later developed applications for smartphones, by the time smartphone adoption reached most of the Asian population, the technology companies in the West had gained brand following and loyalty. Consequently, there was optimum competition in the market which prevented the emergence of a vertical or horizontal ecosystem by a single brand or company.

The second factor is the lagging adoption of digital payments. As stated above, integration of digital payment services have proven to be an adhesive for superapp ecosystems. However, in the West, plastic money (i.e. credit or debit cards) is used as the primary payment method. Consequently, the penetration of digital payments in the West is not as high as Asia. This has also meant that embedded finance integration with superapp contenders has not been widespread in the West.

Additionally, there are other factors centred around the importance of brand identity, apprehensions regarding customer experience, impact on certain revenue streams, heterogenous market, etc., which have led to a stymied growth of superapps in the West.

Regulating superapps: Key considerations and way forward

Global regulatory landscape for superapps

The superapp ecosystem has primarily flourished in South-East Asia, even as it evolves elsewhere in the world. Yet, a dedicated regulatory framework for superapps is largely absent. Only the European Union (EU) and countries like China are moving towards implementing laws and regulations for oversight on such superapps platforms.

In the EU, the Digital Markets Act (Act) was passed in November 2020, which ensures that large online platforms across the EU conduct their business in a fair manner, considering customer interest, and data are protected, and gives space to competition and innovation. The Act outlines various responsibilities for 'Gatekeepers', or those large platforms which provide 'core platform services' with a large user base and operate across various countries in the EU. While the Act incorporates various enabling provisions to promote the growth of these superapps, it also places various compliance conditions on the gatekeepers to ensure the following:

Healthy competition – Third-party apps must be treated equally and can inter-operate with in-house apps
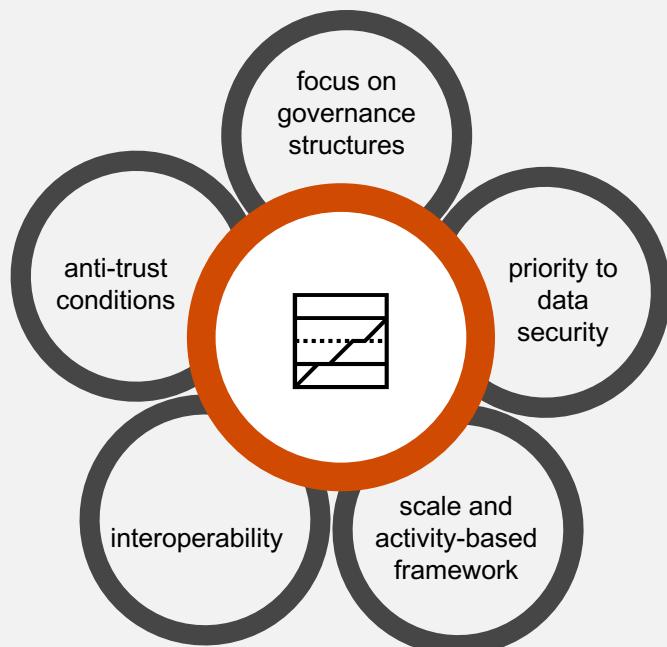
Explicit customer consent – Gatekeepers cannot track customer's data outside the platform without their consent.

Interoperability – Ensure interoperability in messaging services.

Similarly, China had published draft regulations on 'Classification Guidelines for Internet Platforms'; and 'Guidelines to Implementing Subject Responsibility for Internet Platforms' in 2021. These draft guidelines outline the following:

- **Classification of platforms** – Into 3 broad categories based on the nature of services provided on the platform, user base, market size, range of services and their ability to restrict merchant's direct access to customers.

- **Specific responsibilities for 'ultra-large platforms'** – These are platforms with not less than 500 million users, which are required to implement strict data security norms, interoperability, robust internal governance framework, reporting obligations, etc.

Notably, the following common theme is observed across both the EU guidelines and draft guidelines in China –

- focus on governance structures
- anti-trust conditions
- priority to data security
- interoperability
- scale and activity-based framework
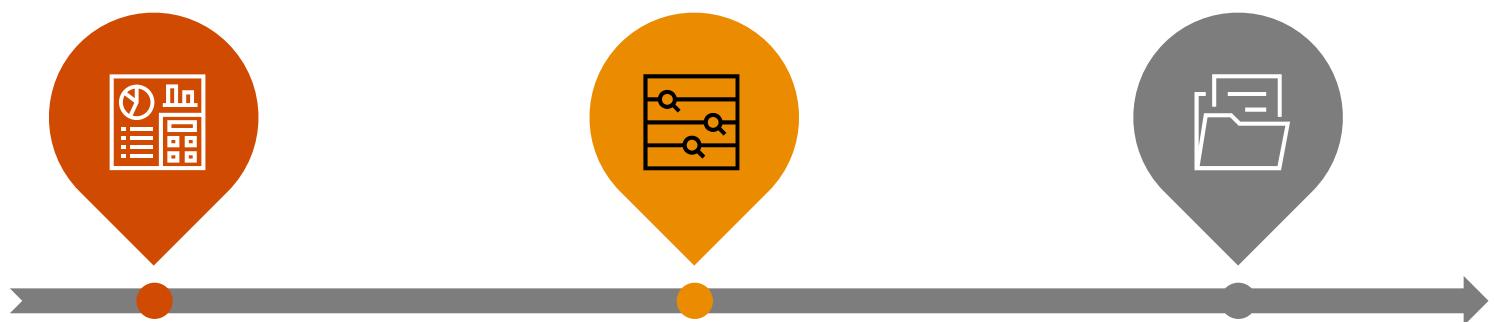
Considerations around the regulation of superapps in India

At present, there is no regulatory framework governing establishment and operations of superapp in India. In fact, with no explicit definition of superapp or even a mention of the term 'superapp' in the regulatory dossiers, circumstances in which any app transitions into a superapp category itself is unclear. While every new entrant in the superapp space is keen to understand and address any potential regulatory concerns upfront, i.e. at the development stage of a superapp, no such reference exists that one can benefit from. Thus, given the regulatory ambiguity around superapps, the current superapps are guided by broad principles pertaining to data privacy, access controls, governance measures, etc., that the players have suo motu put in place. From a regulator's standpoint, given the diverse offerings (regulated and otherwise) falling under the superapp ecosystem, a unified regulation, whether from one regulator or jointly by multiple regulators, cannot be fathomed. This is even more difficult given the multiple regulated and unregulated activities being offered under a single interface.

Some possible considerations for operating superapps are as follows:

A. Customer servicing

For any regulator, customer service and protection assumes the utmost priority. As indicated above, superapps have multiple service offerings under a single interface. It, therefore, becomes important that:

the legal entity offering the service (through the superapp) to the customer is disclosed to the customer upfront and clearly

the customer grievances are addressed appropriately and escalations are seamlessly directed to the legal entity whose products are availed by the customer

transparency regarding terms and conditions, data storage, data analysis, etc., is ensured

B. Governance structure of superapps

Under a typical superapp model, it is likely that regulated and un-regulated services provided by the platform or a third party are integrated into a singular structure. Thus, activities which are typically regulated like payments, banking or insurance will have the same governance structure as that of unregulated activities like ride hailing, e-commerce, or food delivery. From the superapp's perspective, a unified governance structure streamlines its governance and operations. However, this integration may blur the fine line between the governance of regulated and un-regulated activities.

From a regulator's perspective, this may lead to opacity in terms of responsibility mapping and information asymmetry, and may prevent effective monitoring of the regulated activity and their compliances. Crucially, such structures may present as a Key considerations in ensuring customer protection from data and service standpoint and stability of the regulated ecosystem (which is likely to be the financial ecosystem).

C. Alignment with data governance standards

Superapps have revolutionised the way customers access a multitude of services, ranging from e-commerce and transportation to finance, food delivery, and beyond. However, this convenience should not conflict with the data governance and compliance with existing laws. These are highlighted as under:

| 1 | User behaviour analysis and propensity modelling without explicit consent |

The main issue centres on the sharing of customer data without explicit consent between regulated and unregulated entities, including third-party service providers. Once a customer joins a service on the superapp, their data are often shared with other service providers on the platform. These data are then utilised for user behaviour analysis and propensity modelling, which in turn form the basis of banner management on the superapp and the execution of advertisement campaigns. The lack of explicit consent for this data sharing is the crux of the problem.

| 2 | Data security and privacy |

Superapps acquire, process and store substantial consumer data to determine behavioural patterns and preferences. These data, if not secured properly, pose risks of data breaches and misuse.

| 3 | Regulatory compliance |

Superapps often provides services across multiple regulations, each with its own set of data governance laws and regulations. Ensuring compliance with diverse legal frameworks can be complex and resource intensive. In certain cases, the regulators prevent data sharing. Therefore, to decide what has to be common data store versus separated and containerised in-line with different regulations is a key consideration for a superapp.

| 4 | Data minimisation and purpose limitation |

India's Digital Personal Data Protection Act 2023 require that data collected should be minimal and used only for the specific purpose for which consent was obtained. superapps, however, tend to collect extensive data for various services, potentially leading to over-collection and misuse.

D. Information technology (IT) and cybersecurity-related considerations

1. Segregation of data and containerisation

Absence of data segregation is a major impediment, which can lead to unauthorised access and misuse of sensitive information. Without robust data-level segregation, it becomes difficult to ensure that data is only accessible to authorised services and personnel, increasing the risk of data breaches. Proper containerisation is essential for isolating different services within the superapp and ensuring that customer data remains segregated based on the type of service. Another critical issue is inadequate access controls. The absence of stringent authentication and authorisation mechanisms may lead to unauthorised access to user data.

2. Inadequate technology structuring and intellectual property (IP) ownership

Superapps need to be built on scalable, flexible, and resilient architectures to handle diverse services and high user loads. Poor technology structuring can lead to performance bottlenecks, downtime, and scalability issues, impacting user experience and trust. IP ownership of IT asset is a complex undertaking, especially when multiple service providers and/or entities are involved. Clearly defining IP ownership and defining usage rights by determining which entity/entities shall be the Technology Service Provider (TSP) and owner is crucial to avoid legal disputes and ensure that all parties understand their responsibilities and rights regarding the data and technology used within the superapp.

3. Breach of API credentials

A breach of API credentials can occur when API keys or secrets are stored insecurely, insufficient authentication and authorisation mechanisms are in place, inadequate monitoring and logging. To mitigate this risk, superapps must secure storage and management of API credentials, implement authentication mechanisms, enabling IP blocking, monitoring API activity and logging suspicious behaviour, regular security audits and testing.

4. Lateral or pivotal movement attack

Hackers may exploit a vulnerability in one service within a superapp to gain access to other services or features leveraging. By compromising even one service, it can lead to data breach and theft as hackers can potentially gain access to sensitive data of the customer and the service provider.

5. Runtime application self-protection (RASP)

RASP provides an additional level of security that compliments traditional security measures. It helps in detecting and preventing the target memory, validates user input in real-time, prevents malicious data, monitors app behaviour and detect anomalies, ensures data encryption, prevents data tampering, specifies and protects sensitive data, and prevents attackers from extracting data. By integrating RASP into superapps, developers can effectively protect their app and sensitive user data from various attacks, including those that may originate from within app's own services and third-party components.

6. End–to-end encryption (E2EE)

E2EE in superapps needs to balance robust security with seamless user experience, scalability, and regulatory compliance, while managing complex key exchanges and data backup compatibility across different platforms. superapps with E2EE may face difficulties such as latency which may slow down the app, complex compliance requirements (some regulations require access to encrypted data), difficulty in sharing data between apps while maintaining security, management and storage of encryption keys.

7. Certificate validation and pinning
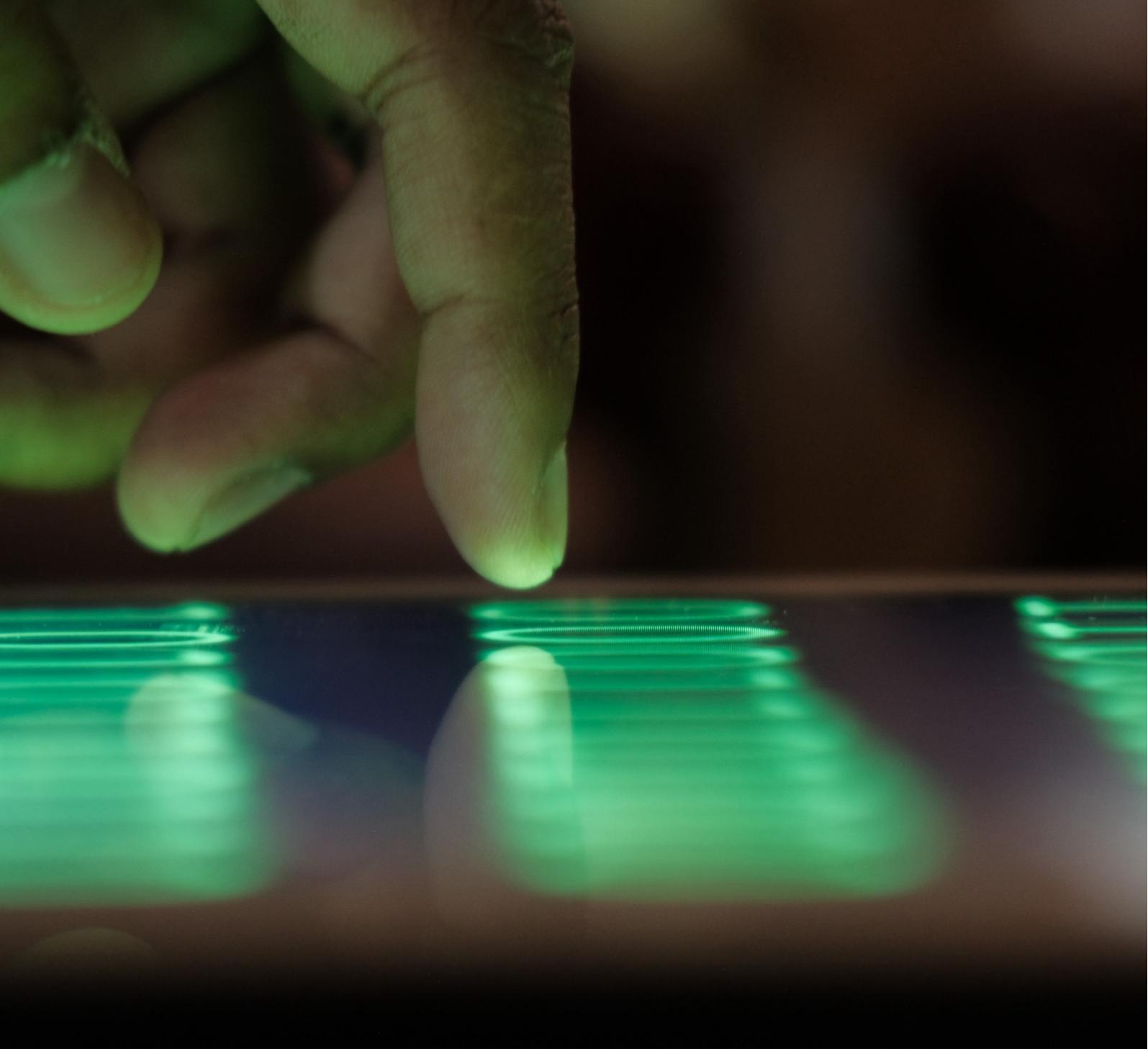
Certificate validation and pinning are security measures used to ensure the authenticity and integrity of encrypted connections. These security measures verify the identity of a servicer, checks the authenticity certificate, prevents man-in-the-middle attacks, associates a specific certificate or public key with services or domain. Absence of these certifications may lead to man-in-the-middle attacks, unauthorised access, data tampering and unsecured data transmissions.

Way forward

As the superapp ecosystem evolves, even the regulatory framework and guidelines for these apps will evolve. Still, to start with, depending on the stage of evolution of superapps and systemic risk they can pose to the economy at large, base regulatory framework and guardrails need to be articulated. The global examples, while they may serve as a guiding light, are in no means the benchmark for 'one-size-fits all' regulatory framework for superapps. Countries like India may take a few leaflets out of these guidelines while determining the way forward vis-à-vis regulatory framework for superapps. However, the eventual approach will depend on the issues and risks that the regulators perceive, overall principles of regulating a business or entity, etc. In summary, Key considerations peculiar to the nature of the market and ecosystem local to India will have to be considered.

In addition to the product, IT and cybersecurity, customer protection specific regulations issued by respective financial sector regulators, India has recently enacted Digital Personal Data Protection Act, 2023, which outlines the responsibilities of data fiduciaries, processors and consent managers in handling customer data. Furthermore, a 'Digital India Act' legislation is also on the horizon, which aims to address challenges around transparency, anti-trust, cybersecurity, etc., in line with the fast-changing dynamics of India's digital economy.

Guiding principles towards regulatory oversight

India sits on the cusp of a superapp revolution with a massive push towards the adoption and growth of superapps. Hence, it is critical that if not an independent regulation, at least, guardrails pertaining to governance structures, handling of customer data, IT, cybersecurity, etc., are set up. Considering the above, the following principles can serve as a guiding light for the industry and regulators for moving towards regulating superapps:

01 — **Consultative and collaborative approach** – Regulators engage with superapp developers, industry experts, and users to understand the ecosystem, impediments of stakeholders, and create a tailored approach regarding regulating and governing superapps.

02 — **Flexible framework** – Establish a flexible framework that accommodates the innovation and evolution of superapps.

03 — **Clear guidelines** – Provide clear, concise guidelines on data collection, storage and usage should be provided to ensure transparency and compliance.

04 — **Industry standards and certifications** – Develop industry standards and certifications programs to promote best practices and ensure compliance. Adopt industry-standard encryption and security measures, conduct regular security audits, regular compliance monitoring framework, etc.

05 — **Transparency** – Maintain transparency through accessible privacy policies, transparency reports and establish accountability mechanisms within the entity or group.

06 — **Customer protection** – Implement robust consent mechanisms to provide users with clear and granular control over their data along with data sharing agreements between entities on a superapp.

07 — **User education and awareness** – Educate users about data protection, privacy and security to empower informed decision making.

08 — **Review and update regulations** – Regularly review and update the framework to address emerging technologies, risks and user needs as the superapps evolve.

Best practices for superapp platform architecture

As the superapp ecosystem evolves, best practices related to IT and cybersecurity should be inherent in the platform's architecture. Therefore, some best practices which can be adopted by such platforms are outlined as under:

1

Scalability: Superapp architecture to accommodate growing user bases and increasing service demands. Utilise cloud-native technologies, containerisation, and auto-scaling capabilities to ensure elasticity and resilience.

2

Resilience and fault tolerance: Redundancy, failover mechanisms and graceful degradation strategies to handle failures and ensure uninterrupted service availability. Use distributed tracing and monitoring tools to detect and troubleshoot issues proactively.

3

Performance optimisation: Performance optimisation should be embedded at every architecture layer, from efficient database queries to lightweight microservices and optimised network communication. Leverage caching, content delivery networks (CDNs), and performance profiling tools to identify and address bottlenecks.

4

Security by design: Security is embedded into every aspect of the superapp architecture, including data encryption, secure communication protocols, role-based access control (RBAC), and regular security audits and penetration testing. Follow industry best practices and compliance standards to safeguard user privacy and prevent unauthorised access.

5

Flexibility and extensibility: Superapp architecture should be flexible and extensible, allowing for the easy integration of new services, features and third-party APIs. Open standards and APIs should be adopted to enable interoperability and facilitate future enhancements without disrupting existing functionalities.

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