

Evolutionary Trajectory:

The Transition from Applications to Super Apps, then to Wallets, and ultimately to Synergetic Wallets -

What Does the Future Hold for App Development?

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Context

[0] In this paper we address the question on how apps, super apps and wallets differ and why the app eco system could or should evolve to synergetic wallets.

Super App

[1] A super-app is a mobile application that incorporates many functions and features that would typically be found in separate standalone apps. They are all-in-one platforms that offer a range of services such as social media, messaging, e-commerce, digital payments, ride-hailing, food delivery, and more. They are designed to offer a seamless and integrated user experience, keeping users within the app's ecosystem for a wide array of needs.

The concept of a super-app is prevalent in many Asian markets, with apps like WeChat and Grab providing a multitude of services within a single platform. For instance, within WeChat, a user can message friends, make video calls, shop online, order food, pay bills, book a taxi, and even make appointments, all without leaving the app.

[2] What differentiates a super-app from a regular app is the breadth and depth of its functionality:

1. **Comprehensive Services:** While a regular app usually focuses on a single function or service, a super-app offers a wide range of services, essentially becoming a one-stop-shop for users' digital needs.
2. **Seamless Integration:** Super-apps are designed to provide a seamless user experience, integrating various services within a single platform. This integration often extends to third-party services as well.

3. **User Engagement:** Due to their extensive functionality, super-apps have the potential to engage users for a longer time compared to regular apps. They can cover various aspects of a user's daily life, from communication and entertainment to shopping and financial transactions.
4. **Data Synergy:** Super-apps can leverage the vast amount of user data they collect across their various services to provide personalized experiences, recommendations, and targeted advertising.
5. **Ecosystem:** Super-apps create their own digital ecosystem, locking in users and third-party service providers. This ecosystem can be a powerful competitive advantage, as it encourages users to stay within the app for most of their digital needs and allows the super-app to cross-sell various services.

[3] In summary, a super-app is like a digital Swiss Army knife, providing a multitude of services within one application, while a regular app is more like a single-purpose tool.

Foundation Digital Wallets

[4] A digital wallet is a software-based system that securely stores users' payment information and passes for numerous payment methods and websites. By using a digital wallet, users can complete purchases easily and quickly with near-field communications technology like NFC or QR e.g. Digital wallets are often used in conjunction with mobile payment systems, which allow customers to pay for purchases with their smartphones. A digital wallet can also be used to store loyalty card information and digital coupons.

[5] There are primarily two types of digital wallets:

1. **Device-Based Digital Wallets:** These are typically found on smartphones and are used for in-store purchases. They use technology like NFC (Near Field Communication) to communicate with the Point of Sale (POS) systems. Examples include Apple Pay, Google Pay, and Samsung Pay.
2. **Online-Based Digital Wallets:** These are used for online transactions. They store users' payment information and autofill it during the checkout process on a website. Examples include PayPal and AliPay.

[6] What differentiates digital wallets from regular apps are the following features:

1. **Payment Information Storage:** Digital wallets store your credit/debit card information securely, allowing you to make transactions without having to input your card details every time.
2. **Enhanced Security:** Digital wallets use encryption and tokenization technology like a trusted execution environment (TEE) to secure your payment information. In case of device-based wallets, they also use biometric authentication (like fingerprint or FaceID) for an added layer of security.

3. Simplified Transactions: With a digital wallet, transactions are simplified as you can pay with just a click, swipe, or by holding your device near a payment terminal.
4. Integration: Many digital wallets are integrated with other services. For example, you can use Apple Pay directly from within other apps, and Google Pay is integrated with other Google services.

[7] In summary, while regular apps serve a variety of purposes, digital wallets are specialized apps designed to make storing payment information and transacting easier, quicker, and more secure.

Evolution - Beyond Simple Payment Wallets

[8] But Digital wallets can also store a variety of information beyond just payment details. This can include:

1. Identity Documents: Some digital wallets can store digital copies of your identification documents, such as driver's licenses, passports, or social security numbers. This can be useful for identity verification processes.
2. Tickets and Passes: Digital wallets can store digital versions of tickets (like concert or movie tickets) or passes (like boarding passes for flights). These can often be scanned directly from your device at the relevant venue or airport.
3. Loyalty and Membership Cards: Many digital wallets can store information about your loyalty or membership cards, allowing you to earn points or access member benefits without needing to carry around physical cards.
4. Coupons and Vouchers: Digital wallets can also store digital coupons or vouchers, which can be used to access discounts or special offers at participating retailers.
5. Health Information: Some digital wallets, like Apple's Health app, can store medical information, such as allergies, blood type, medical conditions, or even vaccination status.
6. Cryptocurrencies: Certain specialized digital wallets are designed to store, receive, and send cryptocurrencies like Bitcoin, Ethereum, and others.
7. Keys: Digital wallets can store digital keys, such as those used for hotel rooms, rental cars, or even your own home if it has a compatible digital lock.
8. Self-sovereign Identity (SSI): This is a model for managing digital identities where an individual or organization has sole ownership over the ability to control their accounts and personal data. It's a concept that allows individuals to control their own identity, without the need for an intermediary or centralized authority. SSI gives users control over how their personal data is shared and used. Under this model, the user can store their identity data on their device and provide it efficiently to those who need to validate it, without relying on a central repository of identity data.

By securely storing all this information, digital wallets can help to simplify many everyday tasks, reduce the need for physical cards or documents, and help to streamline various processes in a secure and convenient way.

[9] A common characteristic of digital wallets is the process of issuing information and having it verified by third parties. In general it can be described by the following steps:

1. Issuance: The user requests a certain credential from an issuer. The issuer could be a government body, an educational institution, a healthcare provider, or any trusted entity that can verify the user's claim. For example, a university could issue a digital diploma, or a government could issue a digital driver's license.
2. Verification: The issuer verifies the user's identity and the authenticity of the claim. This process may involve checking existing records or requesting additional evidence. Once the issuer is satisfied, they sign the digital credential using their private key and issue it to the user.
3. Storage: The user receives the signed credential and stores it in their digital wallet. The credential is secured and controlled by the user, who can choose when and where to share it.
4. Presentation: When the user needs to prove a certain aspect of their identity or eligibility, they share the relevant credential from their digital wallet with a verifier. This could be done through a QR code, a secure link, or directly through an app.
5. Verification: The verifier checks the credential's signature using the issuer's public key to ensure it's genuine and that it hasn't been tampered with. They might also check that the credential hasn't been revoked by the issuer. If everything checks out, the verifier accepts the credential as proof of the user's claim.
6. Trust: The verifier does not need to contact the issuer directly, as the issuer's digital signature provides the necessary trust. This also preserves the user's privacy, as the issuer doesn't need to know who the user is sharing their credentials with.

[10] This process allows users to maintain control over their personal information, deciding who gets access to what information and when. It also provides a secure and tamper-proof method of verifying information, as digital signatures ensure the authenticity and integrity of the credentials.

[11] Often this process revolves around the principles of decentralised identity or SSI, but can also be applied in a proprietary way as it is the case with the Apple Wallet or Google Pay for some parts.

[12] With regards to SSI, digital wallets offer the concept of Verifiable Presentations, which is a powerful feature that significantly enhances the user experience. A Verifiable Presentation is a collection of one or more Verifiable Credentials from a user's digital wallet. These credentials are bundled together and presented to a verifier when needed. This allows a user to prove multiple aspects of their identity or eligibility at once, without needing to present each credential separately. A verifier is even able to articulate its exact presentation requirements using the Presentation Exchange Specification, which is a set of rules and protocols that define how these presentations should be created, requested, and verified. It's essentially a common language that all parties involved in the exchange can understand and follow

For example, if you're applying for a job, you might need to prove that you have a certain degree, that you're above a certain age, and that you have the right to work in a certain country. With Verifiable Presentations, you can bundle together your digital diploma, your digital ID card, and your digital work permit into a single presentation, and then share this with the employer.

This drastically enhances the user experience for several reasons:

1. **Convenience:** Rather than having to present multiple credentials separately, users can bundle everything they need into a single presentation. This makes the process faster and more convenient.
2. **Privacy:** Verifiable Presentations can be designed to only reveal the minimum amount of information necessary. For example, if you only need to prove that you're above a certain age, you can do this without revealing your exact birth date.
3. **Security:** Because Verifiable Presentations are digitally signed, they provide a secure and tamper-proof way of proving your claims. Verifiers can easily check the signatures to ensure the credentials are genuine and haven't been altered.
4. **Control:** SSI puts users in control of their own identity data. They can decide which credentials to include in a presentation, and who to share this with.

[13] In summary, Verifiable Presentations are a powerful feature of a SSI approach that allow users to bundle together multiple credentials into a single, convenient, and secure presentation, enhancing the user experience and giving users more control over their personal data.

Revolution – Synergetic Wallets

[14] Since multi-credential presentations creates several synergetic effects for the user, digital wallets supporting this feature might therefor hereby called **synergetic wallets**. They set themselves apart from other solutions by offering:

- **Combination of Multiple Processes:** In this era, a digital wallet can handle various tasks in a single transaction. For instance, it could simultaneously verify identity (like showing a passport), process payments, and provide guarantees or other financial instruments.
- **One-Step Verification and Transaction:** The use of a single QR scan or NFC (Near Field Communication) tap to complete all these functions. This implies a high level of integration and coordination between different systems and services within the wallet.
- **Efficiency and User Convenience:** The synergy in these wallets lies in their ability to significantly streamline complex transactions, making processes that would typically require multiple steps and verifications possible in one quick action. This greatly enhances user convenience and transaction efficiency.

Outlook

The Future of Digital Euro Wallet

The Digital Euro Wallet is often touted as a groundbreaking and contemporary solution. However, in its current form, it primarily functions as a conventional payment wallet, lacking any supplementary features. While it mirrors the existing successful payment solutions in the market, the Digital Euro has not yet progressed towards becoming a synergetic wallet or fostering an open and expandable ecosystem. The true potential of the Digital Euro Wallet lies not only in its ability to facilitate transactions but also in its

capacity to evolve into a more integrated platform that offers a range of services, akin to the concept of synergetic wallets. It is the integration of such additional functionalities that will determine the wallet's ability to stand out in the digital economy and meet the complex needs of contemporary users.

Exploring the EUDIW's Potential Beyond Payment Transactions

While the European Digital Identity Wallet (EUDIW) is not primarily designed as a Payment Wallet, its foundational principles and architecture inherently support the functionalities of a native Payment Wallet as well as those of a Synergetic Wallet. The innovative EUDIW Architecture Reference Framework (ARF) is pioneering in its approach, offering a structure and set of protocols that seamlessly amalgamate payment processing, credential verification, and data exchange into one secure and authenticated transaction. This standardization and regulation of transactions represent a significant advancement over the capabilities of the current Digital Euro Wallet.

Moreover, the EUDIW extends well beyond the present scope of the Digital Euro Wallet, potentially serving as both an exemplary archetype and a foundational framework for it. Given that both initiatives are under the auspices of the European Union, there is a compelling opportunity for policymakers to synthesize the strengths of both systems. This integration would capitalize on the robustness of the EUDIW's infrastructure to enhance the functionality and user experience of the Digital Euro Wallet, thereby creating a cohesive and comprehensive digital financial ecosystem within the EU.

Get in touch!

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