

What can Least Develop Countries (LDCs) Learn from China's CBDC Project

Executive summary

Central Bank Digital Currency (CBDC) is likely to offer the best solution to the financial inclusion and remittance problems that bedevil most economies. Developing a safe, efficient, and accessible CBDC by any country will require considerable expertise and a deep understanding of the design issues. Central banks need to engage all technological and business experts to approve a resilient CBDC design model. While it is advantageous to several countries to learn from others that have already launched CBDC, this report explores the technical and business-related features of Chinese CBDC (e-CNY).

The paper covers the timeframe of the e-CNY revolution, research engagement forums, design and wallet features, and piloting emerging news. It also reveals desirable features that Least Develop Countries (LDCs) could enumerate accordingly. The report recommends that CBDC is a mega project that requires a robust financial regulatory framework and infrastructure and that LDCs should halt the hurrying race and take the time to research, prepare and design their digital currency.

Keywords:

Central Bank Digital Currency (CBDC)

e-CNY

Digital Yuan

Least Develop Countries (LDCs)

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Objectives

The paper highlights the leading CBDC projects worldwide, notably the Chinese digital yuan. The report presents the timeframe of the e-CNY revolution, research engagement forums, design, wallet features, and piloting emerging news. Agpaytech Research Team arguably discovered several elements from the e-CNY that LDCs can learn.

Methodology

The Research Team used secondary information from credible Chinese outlets, central bank reports, company reports, CBDC white papers, and other financial literature to unveil the leading CBDC insights.

Introduction

A CBDC is a virtual money backed and issued by a central bank. As cryptocurrencies and stablecoins have become more popular, the world's central banks have realized that they need to provide an alternative or let the future of money pass them by. The quest for Central Bank Digital Currency (CBDC) is gaining momentum worldwide. Many Central Banks are moving beyond research and conceptual discussion of CBDCs to piloting and operationalizing designs. Even though CBDC research is early, central banks are organizing resources (technological, human, and money) to harness the new digital money for use. As of March 2022, nine (9) CBDCs have been

launched worldwide in diverse continents, mainly Asia and Africa. Nigeria is the latest country to launch a CBDC, the e-Naira, the first outside the Caribbean (Atlantic Research, 2022).

The Chinese e-CNY is currently grasping global attention due to its widespread use and piloting at the 2022 Beijing Olympics. Besides, the Peoples' Bank of China (PBOC) is pushing for global dominance and the use of e-CNY by partnering with neighboring countries to experiment robust digital cross-border payment system.





Spotlight on the Pioneering CBDCs Projects

Many countries have announced to research, pilot, or launch their CBDCs. Each country is designing CBDC to suit its payment environment with the potential of multi-CBDC integration in mind. For instance, the Central Bank of the Bahamas issued the Sand Dollar. It was the world's first CBDC that covered an entire country. Many countries like China, the Caribbean countries, Nigeria, and United Arab Emirates have issued their form of digital currency. Their digital currencies aim to broaden financial inclusions, improve robust financial settlement systems, create fair competition for private payment platforms and have a legal version of digital money to supplement the cash economy. Table 1 highlights some of the leading CBDCs across the world.

Table 1: Selected leading CBDCs

| | Nigeria | United Arab Emirates | Bahamas | China |
|-------------------------------|--------------------|-----------------------------|----------------|----------------------|
| Name | eNaira | Project Aber | Sand Dollar | e-CNY |
| CBDC Status | Launched | Launched | Launched | Pilot |
| Purpose | Retail | Wholesale | Retail | Retail |
| Architecture | Hybrid | Undecided | Hybrid | Hybrid |
| Infrastructure | DLT | DLT | DLT | Non-DLT |
| Access | Account | Account | Account | Account |
| Technology | Hyperledger Fabric | Fabric | NZIA Cortex | N/A |
| Technology Partnership | Bitt Inc. | N/A | NZIA Limited | Feitian Technologies |
| Cross-Border Projects | Undecided | N/A | Undecided | N/A |

Source: Agpaytech Research

Table 1 illustrates that all the leading CBDCs are accessed through an account-based and token-based system. This means users must have an account with intermediaries (commercial banks and other authorized operators). The shared infrastructure technology is distributed ledger technology (DLT). The majority of the CBDCs are for retail purposes, which means that citizens are predominantly the users, unlike wholesale design for large value transactions at the inter-bank level. The retail CBDC will make central

banks direct transfers to users or residents without passing through third-party banks. Furthermore, the retail CBDCs utilize the hybrid architectural design by bringing authorized operators or commercial banks alongside the central direct payment approach. On the issue of cross-border payment, all the CBDCs are currently exploring the possibility of multi-CBDC integration to affect payment between different digital currency platforms.

A Critical Look at the Chinese e-CNY

The e-CNY, or digital yuan, is a centralized, cash-like digital currency expected to be primarily used for retail payments in China. The e-CNY is fully backed by the People's Bank of China (PBOC) and put into operation by payment service providers. It allows anonymity and better personal information protection yet still keeps sufficient records for tracing illegal activities such as money laundering and tax evasion. The PBOC is rolling out e-CNY in shops around selected cities in China. This is different from WeChat Pay and Alipay, which private corporations run in the country.

Several verified reports indicated that the digital yuan's international debut for global users during the Winter Olympics follows more than a year of pilot runs in about a dozen regions. At the end of 2021, more than 260 million people had e-CNY accounts, and total digital yuan transactions reached nearly 90 billion yuan (\$14 billion or €12 billion), according to the bank.

The Chinese central bank ramped up the trials of its e-CNY last month by launching the pilot version of the digital yuan wallet application on iOS and Android stores (<http://www.xinhuanet.com/>)



PBOC's Definitions of e-CNY

The PBOC chose to define e-CNY as cash in circulation or as M0 in the language of central banks. Defining e-CNY as M0 rather than M1 or M2 has several implications.

- Firstly, e-CNY will be a liability of the PBOC. In China's monetary system, M0 implies direct weakness from the PBOC.
- Secondly, the digital wallets that hold e-CNY will not be considered bank accounts. The PBOC's pilot programs require only a mobile phone number to have an e-CNY wallet.
- Thirdly, no interest can be paid on e-CNY. Interest can be paid on M1 or M2 (bank deposits) but not on M0 (cash). This is important because most digital currencies, including some CBDCs currently being considered, have not ruled out interest payments.
- Lastly, only banks can convert e-CNY into bank deposits and vice versa.

Why did the PBOC Introduce e-CNY?

The main goal of e-CNY is to provide a convenient yet more efficient and secure retail payment system to increase financial inclusion, preserve monetary sovereignty, and provide a "backup" payment infrastructure for the private sector payment solutions. Besides, the e-CNY is expected to promote fair competition and interoperability among the existing payment facilities. For instance, the digital yuan could increase competition in China's mobile payments market dominated by Ant Group's Alipay and Tencent's WeChat Pay (PBOC Report, 2021).

Moreover, Deutsche Bank Research revealed that the PBOC's introduction of the e-CNY serves two different but related goals. First, e-CNY has a long-term objective of competing with other digital currencies, such as bitcoins, stablecoins, and other central banks' digital currencies (CBDC), while ensuring that the Renminbi continues to be the dominant currency in China. The second, more immediate goal is to reshape China's current payment system by providing a cash-like digital payment method: accessible to all, low cost, anonymous (to a certain extent), and facilitating competition among payment service providers.

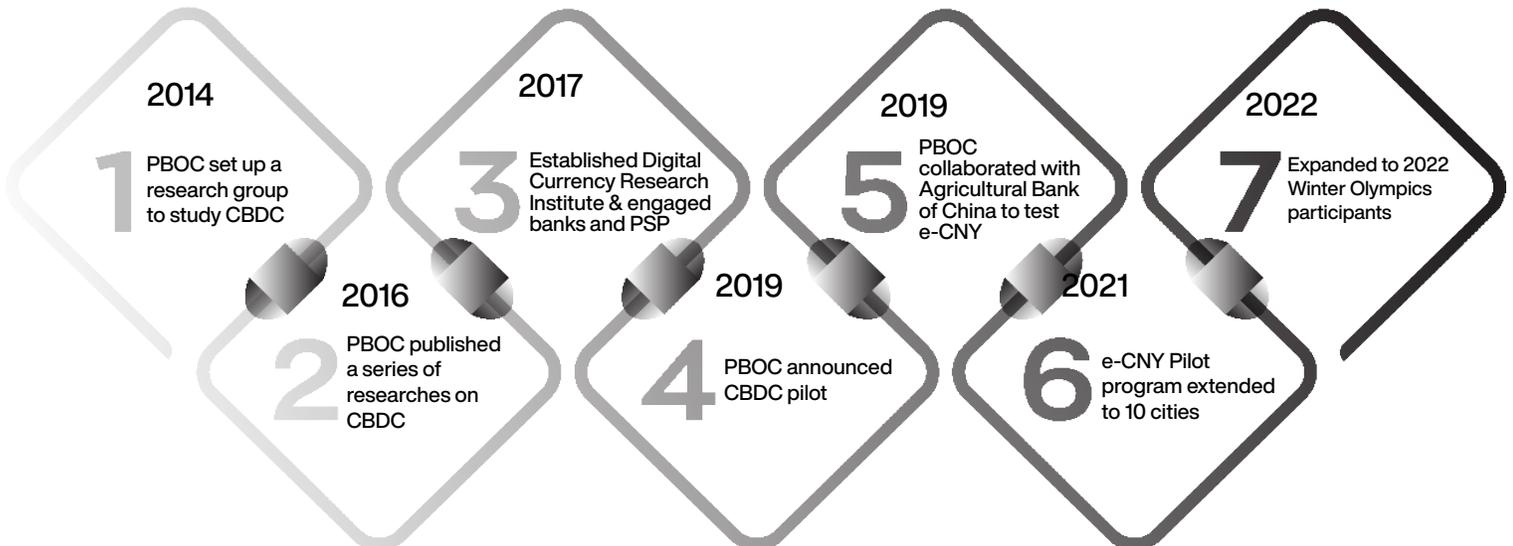


Chinese e-CNY: How it Started

Like every money, it evolves around time and transitions of generations. Over the last decade, tech giants like Tencent have used Alipay and WeChat pay to dominate the Chinese electronic payment system. These payment facilities paved the way for online businesses' tremendous growth, especially Taobao. Internet users continue to grow exponentially, whereas private companies are in charge of all the online payment methods.

PBOC then aimed to compete fairly by attaching great importance to the research and development of digital fiat currency. In 2014, it set up a task force to study digital fiat currency, and its scope of research covered the issuance framework, key technologies, issuance and circulation environment, and international experience. In 2016, the PBOC established its Digital Currency Institute, which developed the first-generation prototype of digital fiat currency. At the end 2017 of, upon the approval of the State Council, the PBOC began to work with commercial institutions in developing and testing digital fiat currency (after this, referred to as e-CNY, a provisional abbreviation following international practices). So far, as the top-level design, function development, and system testing has been completed, the PBOC has initiated pilot programs in some representative regions while ensuring the pilots run in a steady, safe, managed, innovative and practical manner.

Figure 1: e-CNY development



Source: Agpaytech Research

Chinese e-CNY: How it works

The PBOC has developed three main functions of e-CNY: exchange and circulation management, interoperability, and wallet ecosystem. These three category of functions embraces all the e-CNY goals.

Exchange and Circulation of e-CNY

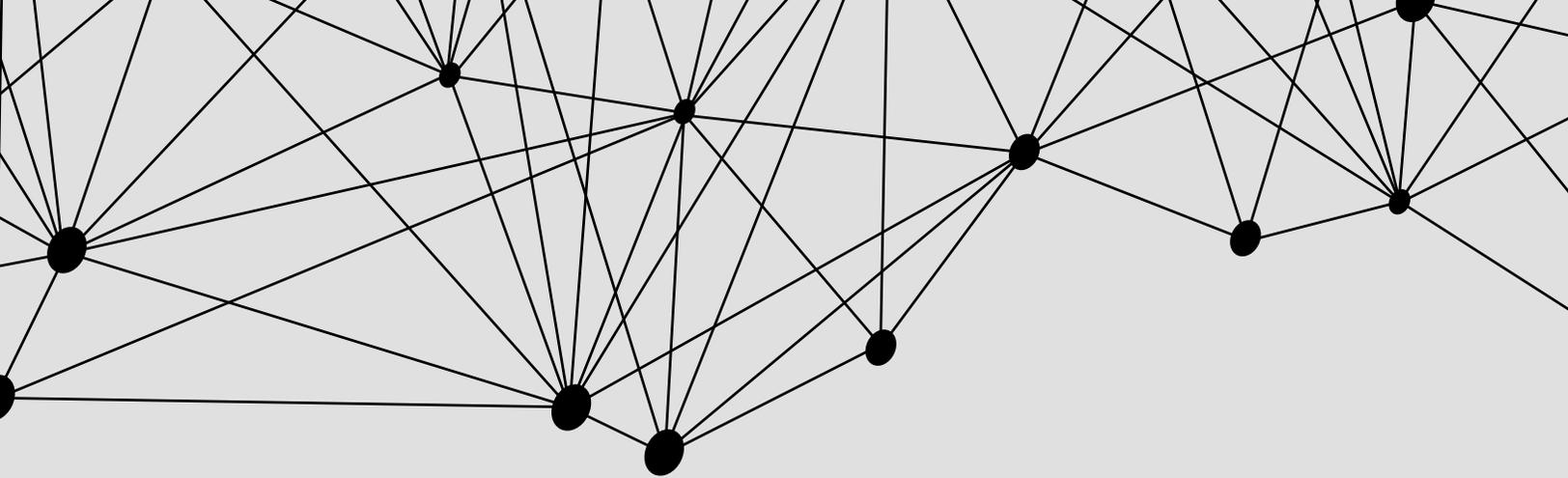
- According to Xinhua, the state media, China's digital yuan will adopt the principle of "controllable anonymity." When trading with digital currency, both parties can be unknown to protect the public's privacy. Meanwhile, the PBOC can use e-CNY to track information relating to corruption, tax evasion, money laundering, and terrorist financing.

- PBOC can hide behind the digital currency app and create conditions for unconventional monetary policy. For example, China could directly transfer digital money to residents' electronic wallets to stimulate the economy. Besides, the PBOC can give small and medium enterprises subsidies by activating the digital yuan to firms that only meet the SMEs threshold.

- China appears to be building its digital trading channels with other countries like SWIFT. Currently, China is pushing for broader use of its currency. To achieve this, PBOC has integrated the e-CNY app on WeChat. Tencent-owned WeChat, China's largest messaging app and one of the country's most prominent payment services, will begin supporting the digital yuan. Teaming up with WeChat means potentially more than 1 billion users could use the digital currency, potentially boosting the e-CNY.

- To increase the circulation and global usage of CBDCs, China and SWIFT partner to take digital currency globally. China's central bank has aligned with SWIFT, the European-based global system for financial messaging and cross-border payments, to set up a joint venture. This joint venture denotes China's ambitions to take the digital version of its currency, the yuan, global (VOA, retrieved April 1, 2022).

- Cointelegraph reported that the PBOC had been widely promoting the use of the Chinese CBDC at the 2022 Winter Olympics. The state-controlled Bank of China set up some special ATMs at some central venues at the Games, allowing international guests to convert their foreign banknotes into e-CNY or standard yuan banknotes.



Architectural Design of e-CNY

The e-CNY is a hybrid and Non-DLT Account-based. The partner technology provider is Feitian Technologies. The PBOC describes the design of e-CNY as the digital version of fiat currency issued by the PBOC and operated by authorized operators. It is a value-based, quasi-account-based, and account-based hybrid payment instrument with legal tender status and loosely-coupled account linkage. Moreover, it has a variable face value, and its value transfer takes the form of cryptocurrency strings.

- Firstly, e-CNY has all the basic functions of money: unit of account, medium of exchange, and store of value. Same as the physical form of RMB, e-CNY is China's legal tender. Secondly, e-CNY is the digital version of China's fiat currency.

- e-CNY adopts a centralized management model and a two-tier operational system. This means the right to issue e-CNY belongs to the state. The PBOC lies at the center of the e-CNY functional system. It issues e-CNY to authorized operators, which are commercial banks.

- The e-CNY is a substitute for M0. Thus, it is treated the same as the physical RMB under M0, which carries and pays no interest.

- Managed anonymity: E-CNY follows the principle of "anonymity for small value and traceable for high value" and attaches great importance to protecting personal information and privacy.

- Internally, the PBOC sets up a firewall for e-CNY-related information and strictly implements information security and privacy protocols, such as designating special personnel to manage information, separating e-CNY from other businesses, and applying a tiered authorization system, putting in place checks and balances, and conducting internal audits.

e-CNY Wallet Design

- Digital wallets are the medium of e-CNY that reaches out to users. Based on centralized management, unified cognition, and anti-counterfeiting, the PBOC makes the rules while authorized operators jointly develop and share apps on mobile devices.
- There are different wallets, depending on customer personal information identification strength. Authorized operators assign different types of digital wallets to customers based on the power of their information identification and set per-transaction and daily limits and maximum balance according to the strength of real-name information.
- There are parent wallets and sub-wallets, depending on the authorization. The wallet holder can set the main wallet as the parent wallet and open several sub-wallets under it. Individuals can set payment caps, conditions, personal privacy protection, and other functions through sub-wallets; enterprises and institutions can pool and distribute funds and manage finance.



Insight from Chinese e-CNY

The Chinese digital currency has unique and distinctive qualities that Least Develop Countries (LDCs) can learn from, ranging in e-CNY design, operation, and wallet features. It must be noted that China already has the quality and large infrastructure to make e-CNY easier to function, like the widespread availability of ATMs, banks, internet facilities, smartphone usage, and higher computer literacy. This prerequisite infrastructure makes e-CNY operation a mega project for the people of China. Let us explore the following innovative ideas from e-CNY;

➤ **Controllable anonymity:** users of e-CNY wallets disclose their transactions to the PBOC as the sole third party. In this case, users would have a "loose coupling of accounts," meaning that the bank account may not be necessarily linked to the digital yuan.

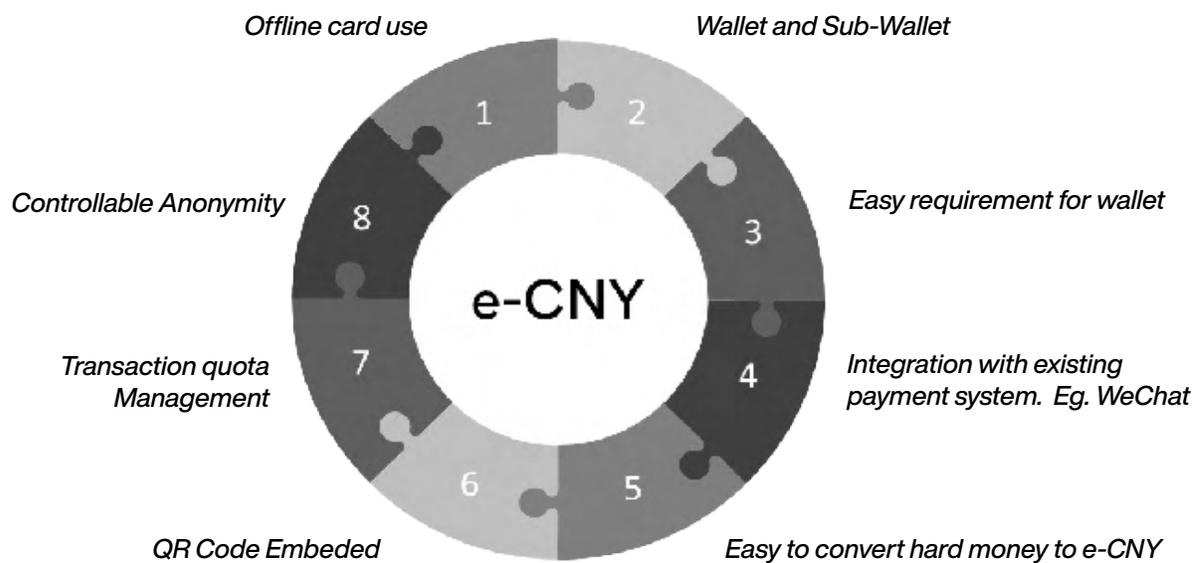
➤ **Transaction quota management:** the digital yuan under the quota management of the PBOC, the authorized operators open different types of digital wallets for customers based on the strength of customer personal information identification and provide e-CNY exchange services. This means the authorized financial operators use the KYC system and provide different services or transaction quotas. For instance, a foreigner who just opened an account cannot make transactions to a certain amount. This feature could control money laundering and fraud and strengthen risk-free operations.

➤ **Integration of existing payment wallets:** The largest payment wallet from Tencent Holding Ltd now allows WeChat users to choose to pay with digital yuan as a newly-added access point embedded in WeChat Pay. First, people have to go through identity authentication via the e-CNY app. Once activated, the function allows users to pay or receive digital currency in WeChat.

➤ **Embedded in Quick Response (QR) code**
The QR code makes it easy, convenient, and time-efficient to pay or receive e-CNY from peer-to-peer, business to peer, consumer to business, close or far. Government and private corporations have e-CNY QR codes. They can be used at railway stations, shopping malls, pay fees, pay Didi (the Chinese version of uber or taxi), and almost everything that accepts cash.

- **Easy requirement for e-CNY Wallet:** The digital yuan wallet application is now accessible on mobile phone app stores like Play Store and ios. After downloading the app, one has to type in their phone numbers, set usernames, and personal identification number (PIN) for payment. They can open digital currency wallets on the app run by authorized operators without inputting personal information such as name, ID, bank card, etc. These wallets can be later upgraded with real-time information according to the users' needs.
- **Sub wallets:** The e-CNY has been designed to perform multiple functions. There is a sub-wallet in the app that can connect users' wallets to different online merchant platforms, through which users can pay on these platforms with digital yuan PIN-free. They can manage the transaction limit of each of their sub-wallet in the app.
- **From cash to e-money to e-CNY hardware card:** Almost all their ATMs accept cash deposits in China. All one has to do is deposit cash in the ATM, then select a purchasing card equivalent to the amount deposited. A person can use this card to pay for all goods and services until the amount on the card is finished. Besides, this feature is also the offline functionality feature of the e-CNY. Individuals have cards to load their digital currency to pay for goods in physical shops everywhere.

Figure 2: Insight from e-CNY



Source: Agpaytech Research



Conclusion

The digital yuan design and features are a perfect CBDC model for Least Develop Countries (LDCs) to emulate. Agpaytech justifies this assertion that the PBOC took almost six years to research e-CNY. They had a whole Research Institute for Digital Currency that engages all stakeholders in in-depth engagement. Moreover, the existing infrastructure based in China was momentum for operationalizing its digital yuan. Although e-CNY seems to be competitive with the already payment corporations, WeChat Pay has embraced the system, making it optional to pay with e-CNY or WeChat Pay. This conducive environment is a win-win for all payment technology companies.

In a nutshell, this paper argues that LDCs should take time to research on CBDCs. They should understand the economic environment, current payment infrastructure, operability with existing payment systems, possible features that could improve large user-based, the challenges or gaps CBDC will improve, the long-term flexibility of the country's financial goals, and many social relation aspects.

It must be noted that CBDCs are not competition, but a country desires to improve or renovate its financial sector for greater convenience and possibilities and drive financial inclusion for the safety of the people it serves. Therefore, LDCs should take time to learn from mega CBDC projects and design or research innovatively.

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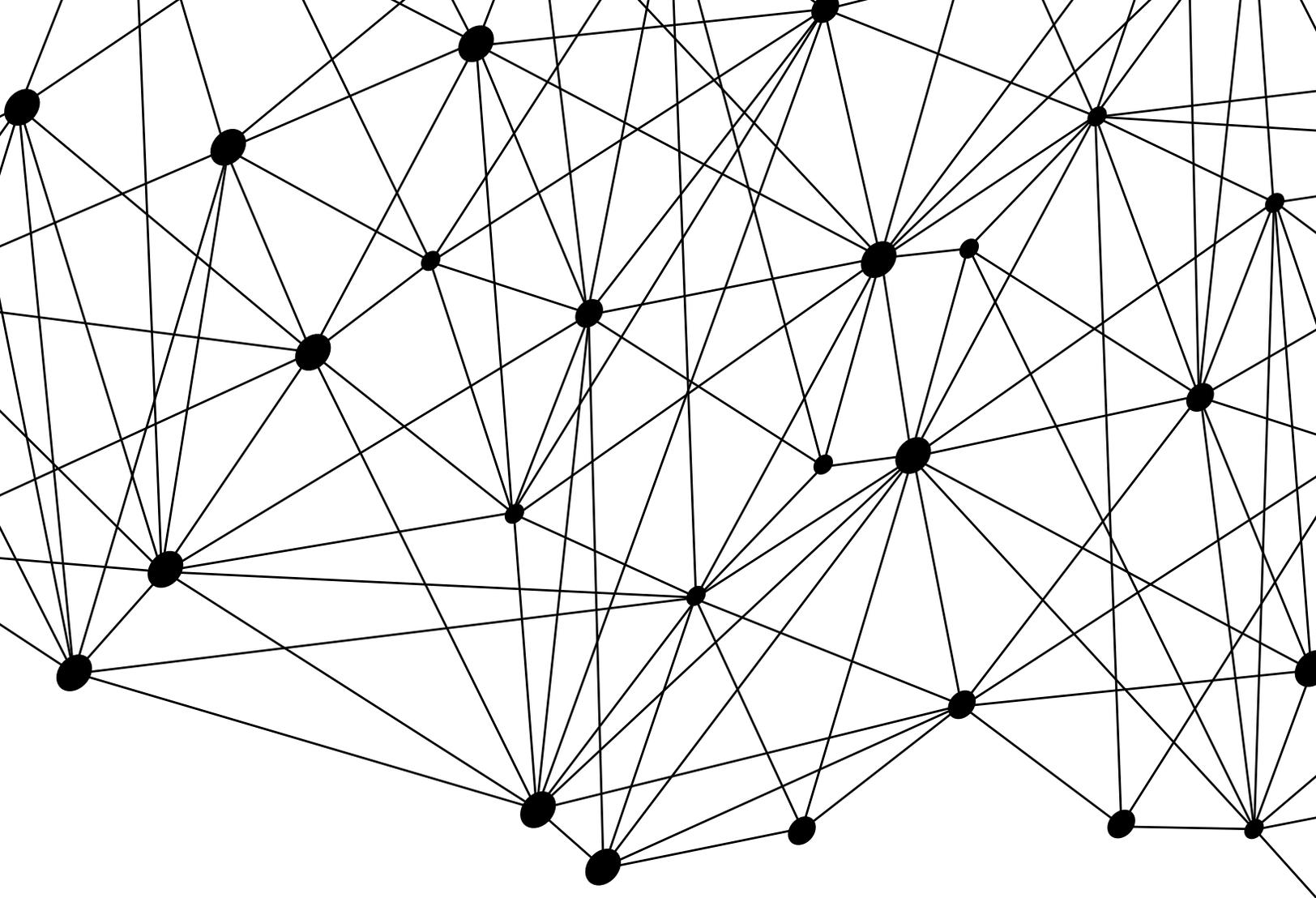
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About Agpaytech

Agpaytech is a company pioneering in the Fintech Space with a focused approach to building robust technologies for eCommerce Card Processing Solutions for Payment Service Providers (PSPs). Additionally, we provide Compliance and Regulatory Umbrella, Remittance-as-a-Service White-Label Solution, Foreign Exchange, Cross Border Payments, and digital currency technology. We have partnered with multiple banks, non-banking financial institutions, and corporate organizations to create a solid service delivery model for them and their customers to ease their international remittances and payments concerns. info@agpaytech.com



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